HENLEY BROOK AVENUE EXTENSION

REVEGETATION MANAGEMENT PLAN

Prepared for:	City of Swan
Report Date:	17 August 2023
Version:	1
Report No.	2023-772

PGV ENVIRONMENTAL

Contents

List of Attachments

1 INTRODUCTION

1.1 Background

The City of Swan is in the process of planning for the extension of Henley Brook Avenue from its current alignment near Gnangara Road to south of Henley Street (Figure 1). The proposed road works will be partly within an unmade road reserve at the northern end and through mostly private lots at the southern end (Figure 2).

The road works will result in the clearing of approximately 2.0ha of native vegetation, of which 0.64ha is foraging habitat for Black Cockatoos. An application for a Clearing permit was originally submitted to the Department of Water and Environmental Regulation (DWER) (CPS 9953/1) for the entire road to be constructed, however the northern part of the reserve does not contain any significant vegetation so was split from the southern part. The northern part was granted a clearing permit approval on 26 July 2023. The southern part is the subject of a new application. During discussions DWER indicated that a Revegetation Management Plan (RMP) should accompany the application for the southern part of the road works.

PGV Environmental was commissioned by the City of Swan to prepare a Revegetation Management Plan (RMP) to be implemented to manage the impact of the proposed road works.

1.2 Location of Revegetation

The proposed revegetation will be undertaken in the Henley Brook Avenue Road Reserve upon the completion of the construction of the road. The parts of the road reserve that are proposed for revegetation include the median strips and central parts of the roundabouts, and around the drainage basin. The revegetation works include the southern portion that is subject to a new clearing permit as well as the northern portion which received a clearing permit on 26 July 2023.

1.3 Purpose

Planting of trees in the constructed Henley Brook Avenue road reserve is being undertaken for the purpose of offsetting the impact of clearing Black Cockatoo foraging and potential breeding habitat in association with the road works. The RMP has been prepared to set out the strategies for the design, implementation, monitoring and maintenance activities of revegetation works.

1.4 Objective

The overall objective of the RMP is to re-establish Black Cockatoo foraging and potential breeding habitat in the Henley Brook Avenue Road reserve. The final planting will result in a net gain of habitat within the road reserve.

1.5 Scope of Work

The RMP has been prepared in accordance with DWER's *Guide to Preparing Revegetation Plans for Clearing Permits* and includes the following:

- A description of the area to be revegetated within the road reserve;
- Revegetation commitments;
- Site preparation;
- Species list compilation and revegetation techniques;
- Monitoring and analysis;
- Schedule of Works;
- Targets and completion criteria; and
- Maintenance and contingency measures.

1.6 Legislation and Regulatory Framework

Legislation directly relevant to the management of native vegetation in Western Australia and to this RMP is provided in Table 2.

Table 1: Relevant Legislation

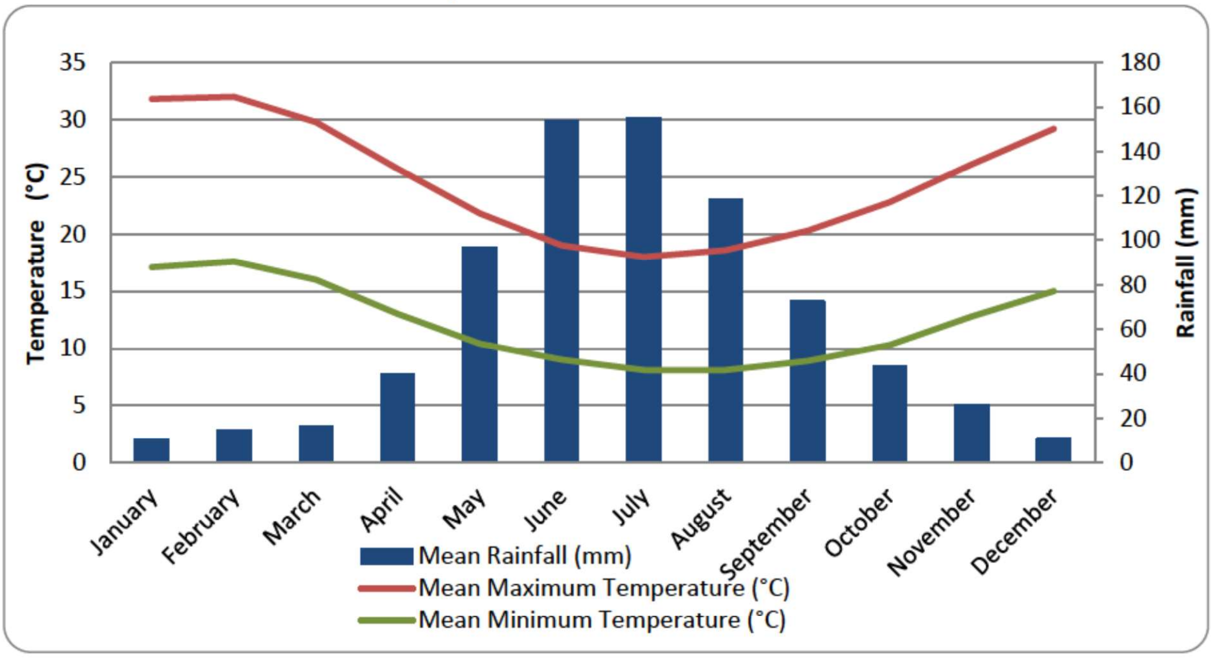
Legislation	Application
Biodiversity Conservation Act (WA) 2016 (BC Act)	Conservation and protection of biodiversity and biodiversity components. This Act repeals the *Wildlife Conservation Act 1950.*
Environment Protection Act 1986 (WA) (EP Act)	Prevention, control and abatement or pollution and conservation protection and enhancement of environment. Application for the Clearing Permit is made under S38.
Environmental Protection (Clearing of Native Vegetation) Regulations 2004 (WA)	Regulates the clearing of native vegetation.
Rights in Water and Irrigation Act 1914 (WA) (RIWI Act)	Relates to rights in water resources, to make provisions for the regulation, management, use and protection of water resources, to provide for irrigation schemes and for related purposes. Applies to works around St Leonard's Creek.

2 EXISTING ENVIRONMENT

2.1 Climate and Rainfall

Western Australia experiences a Mediterranean climate with warm dry summers and wet cool winters. Peak rainfall periods are between May and September. Climate statistics from the Bureau of Meteorology (BOM, 2023) provide mean values for maximum and minimum temperature and rainfall (Graph 1). The statistics have been measured on the Perth Aero Site (BOM Site Number 009021), which has been collecting data from 1951.

Graph 1: Mean Climate Statistics



2.2 Topography

The site is mostly flat 30-32 m Australian Height Datum (AHD) with a ridge line at the northern end rising up to 40m AHD (Figure 2).

2.3 Geology and Soils

The site is mapped on the Bassendean Dune System and consists of very low relief, leached, grey siliceous Pleistocene sand dunes, intervening sandy and clayey swamps and gently undulating plains (Bolland, 1998). These soils are very leached, infertile and mildly acidic (DPIRD, 2023).

The soil phases mapped on the site are:

- Bassendean, Jandakot Phase (212Bs_Ja) which is associated with low, gently sloping dunes on Aeolian sands. The soils are described as grey sand over pale yellow sands generally underlain by humic and iron podzols;

- Bassendean Yanga Phase (Bassendean) Phase (212Bs_Ya) which are located on poorly drained flats on alluvial deposits. The soils are semi-wet soils, yellow-brown shallow sands and grey deep sandy duplexes and are usually associated with dense *Melaleuca* scrub; and
- Bassendean Joel Phase (212Bs_J) which are poorly drained depressions with humus podzols; and
- VC - Valley complex (Bassendean) (212Bs_VC) which are variable soils associated with drainage lines associated with St Leonards Creek (DPIRD, 2023).

2.4 Hydrology

2.4.1 Groundwater

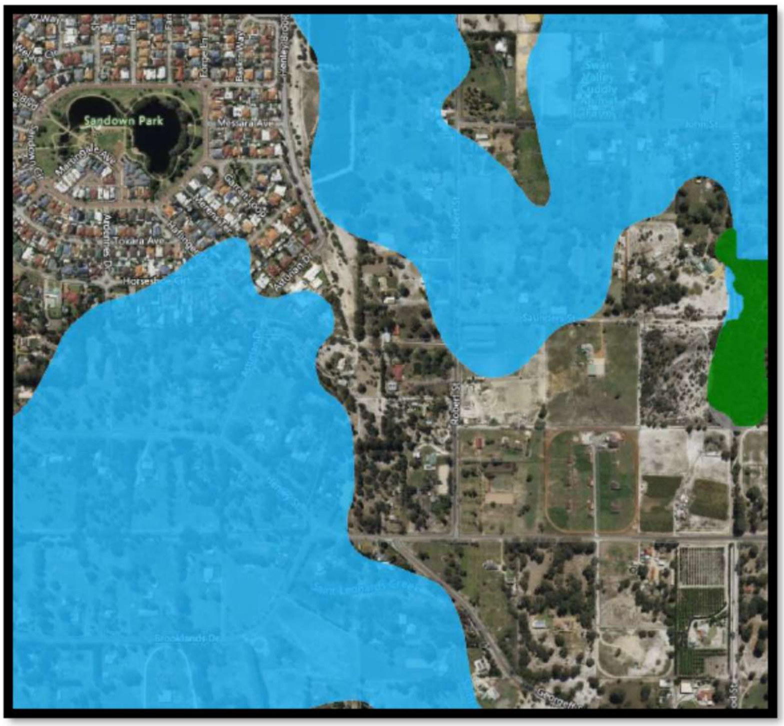
The site is on the Perth Surficial Swan and Mirrabooka aquifer. The Superficial Swan overlays the Leederville aquifer which is further described as the sub area Wanneroo member under the site and consists of poorly sorted fine – to medium-grained quartz with feldspar and occasionally trace heavy minerals. This overlays the Yarragadee aquifer (DoW, 2015).

Groundwater flows generally to the south-east and is between 27mAHD and 30mAHD (DWER, 2023). The depth to groundwater from the natural surface ranges from approximately 3 to 5m (DoW, 2015b). Annual average maximum water levels will be higher than the May 2003 levels as indicated.

2.4.2 Surface Water

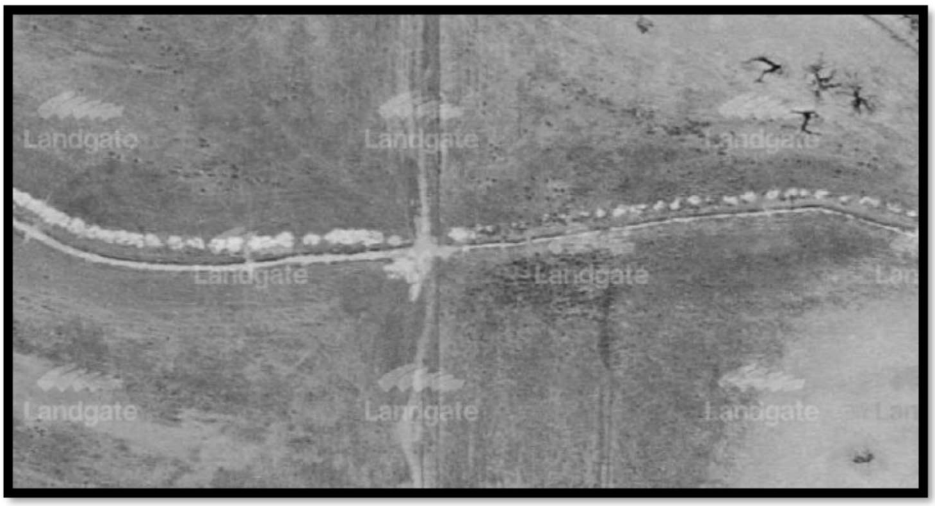
The southern end of the road extension works site passes through a 'Multiple Use' palusplain wetland (UFI 13396) (shown in blue on Plate 1). The wetland in this location is highly modified and largely cleared of native vegetation.

Plate 1: Wetland Mapping (National Map, 2023)



The southern part of the extension crosses over a portion of the northern arm of St Leonards Creek. In this location the creek has been highly modified into a drain. The aerial photograph from 1965 (Landgate, 2023) shows the creekline has been excavated (Plate 2), most likely to facilitate draining of the Multiple Use palusplain wetland.

Plate 2: St Leonards Creek Excavation in 1965



2.5 Vegetation

2.5.1 Vegetation Description

The vegetation on the site is a mixture of planted trees such as River Red Gums (*Eucalyptus camaldulensis*) and Tuart (*Eucalyptus gomphocephala*) and scattered remnant native Jarrah (*Eucalyptus marginata*), Banksia (*Banksia attenuata, B. menziesii*) and Marri (*Corymbia calophylla*). Most of the Marri trees are young (Plate 8), however several larger trees also occur.

A stand of *Acacia saligna* (Orange Wattle) shrubs and *Adenanthos cygnorum* (Woolly Bush) occur in the central part of the site.

The northern part of the road works contains only 0.043ha of scattered native vegetation and otherwise contains non-native Geraldton Wax, weeds or bare ground.

2.5.2 Vegetation Condition

The vegetation condition of the road reserve is Completely Degraded according to the condition scale of Keighery (1994) published in Bush Forever (Government of Western Australia, 2000).

3 REVEGETATION MANAGEMENT PLAN

3.1 Revegetation Context

The proposed revegetation in the road reserve will be the planting of trees in landscaped areas rather than the re-creation of intact native trees and understorey. The landscaping will consist of a tree canopy over mulch due to insufficient water allocation for the installation of a reticulation system for smaller shrubs. The canopy will provide habitat for Black Cockatoos, similar to the current habitat, with Eucalypt/Corymbia and Banksia trees.

The drainage basin located near St Leonards Creek Landscaping in the drainage basin will be landscaped with largely native species. The basin will be planted with a mixed of reeds to trap any sediments and utilise any nutrient run-off from the road. The upper banks and top will be planted with an overstorey consistent with the species utilised for the median strips.

The revegetation will result in the planting of at least 44 trees being established within the road reserve and a net gain in foraging habitat. (replacing potential breeding habitat at a ratio of 3.4:1) The revegetation will establish a canopy in the northern part of the road extension that is currently non-existent.

3.2 Site Preparation

The site will be completely cleared and median strips established as per standard road construction. The soil within the median strip will be stabilised with mulch prior to planting.

3.3 Species

The proposed revegetation will consist of tree species that will be procured as more mature specimens in 45 to 100L pots. The native species recommended for use (Table 2) have been selected using four criteria as follows:

1. The species will be consistent with other sections of the constructed road;
2. The species are known Black Cockatoo foraging and potential breeding habitat species;
3. The species used will be able to tolerate the site conditions without the requirement for water; and
4. The species should be available from plant nurseries.

Table 2: Native Species for Rehabilitation

Species	Common Name	Foraging habitat	Potential Breeding Habitat
Banksia prionotes	Acorn Banksia	✓	
Callistemon viminalis/King's Park Special	Bottle Brush		
Corymbia calophylla	Marri	✓	✓
Eucalyptus accedens	Powderbark Wandoo		✓
Eucalyptus marginata	Jarrah	✓	✓
Eucalyptus todtiana	Black Butt	✓	
Hakea laurina	Pincushions	✓	

The drainage basin will be planted with native vegetation to encourage biological nutrient uptake, consistent with the *Vegetation guidelines for stormwater biofilters in the south-west of Western Australia* (Monash University, 2014). The species chosen will have extensive and fine root systems, be relatively fast growing, be able to withstand temporary and regular inundation, and have long growing seasons. A sufficient density of plants of at least 4/m2 is recommended to provide adequate initial coverage and room for growth. Species will be native and planting in accordance with WQPN 84: Rehabilitation of disturbed land in PDWSAs (DWER, 2009).

3.4 Planting

Species will be planted in rows within the median strip and in the central part of roundabouts. Infill planting will be undertaken if any areas do not meet the completion criteria after 1 year.

3.5 Weeding

Weeds will be minimal in the median strip as the soil will be stripped from the site during roadworks. Revegetation of road reserve median strips will commence at the first break of season where any weeds that have subsequently grown on the site will be sprayed or removed by hand by an appropriately qualified weed contractor using methodology guided by the species profile in Florabase (https://florabase.dpaw.wa.gov.au/) (DBCA, 2023).

3.6 Completion Criteria

The following targets will be used to assess the performance of the rehabilitation and identify if additional seeding/planting or management works are required:

- Survival of 80% of trees planted in the median strip and in the central areas of the roundabouts;
- A maximum weed cover of 5%; and
- No bulbous weeds, Declared Pests (such as Pampas grass, Bridal Creeper, Cape Tulip, Narrow-Leaf Cotton Bush, Paterson’s Curse, Caltrop), noxious weeds, or woody weeds within the revegetated area.

3.7 Monitoring

Monitoring of the revegetation will be a visual inspection of all planted trees within the median strip and in the roundabouts.

Monitoring of the revegetation area will commence in October/November following planting to establish initial survival rates and a follow-up in March/April the following year to monitor the survival rate over summer. Monitoring will continue annually in October/November and March/April each subsequent year until the completion criteria have been reached for a period of at least three years.

3.8 Weed Management

Post planting weed control will be undertaken for a minimum of 2 years post planting and be undertaken twice a year to ensure weeds do not dominate the site. Management measures will be guided by monitoring result to identify the weeds present. Appropriate management techniques as per the species profile in Florabase (https://florabase.dpaw.wa.gov.au/) (DBCA, 2023) will be utilised to manage any emergent weeds on the site.

If weed species are considered likely to pose a threat to achieving successful revegetation results, then weed control appropriate to the species will be undertaken. Weed management will be effective for two years after initial planting.

3.9 Timing

Planting will take place after earthworks for the road batters and roundabouts have been completed and mulched. Planting will commence after opening rains of 100mm in the autumn/winter period which generally is in June/July, consistent with *Guide to Preparing Revegetation Plans for Clearing Permits*. Table 3 outlines the proposed timing for revegetation works.

Table 3: Timing for Revegetation Works

Year	Time	Phase	Pest/Weed Control	Planting	Monitoring
1	Commencement	Soil pile to be removed	Not required – all weeds will be removed with soil		
	Winter	Planting commences		After 100mm of rain has fallen (break of season)	
	Spring		Spray September to October if required		Monitoring commences
	Summer				Monitoring
2	Autumn	Infill Planting	Spray in April to May if required		Monitoring
	Winter			Break of season	Monitoring
	Spring		Spray September to October if required		Monitoring
	Summer				Monitoring
If survival completion criteria not met repeat Year 2					
3	Autumn	Maintenance Year 1	Spray in April to May if required		Monitoring
	Winter				Monitoring
	Spring		Spray September to October if required		Monitoring
	Summer				Monitoring
4	Autumn	Maintenance Year 2	Spray in April to May if required		Monitoring
	Winter				Monitoring
	Spring		Spray September to October if required		Monitoring
	Summer				Monitoring
Completion if criteria are met					

3.10 Contingencies

If the completion criteria are not likely to be met after the first two monitoring periods, then further planting will occur in the second year using the species from Table.

If there is a significant decline or loss in surviving plants the following contingency plan will be implemented:

1. Determine if the decline may be within normal limits – ie due to harsh summer conditions.
2. Consider potential causes for decline in vegetation health including but not limited to:
   a. Increase in competition with weed species;
   b. Predation by herbivores including rabbits and possibly kangaroos; or
   c. Water stress.
3. Implement measures to manage identified causes which may include, but not limited to:
   a. Management of weed species;
   b. Use of tree guards; or
   c. Watering during summer months.
4. Infill plants into impacted areas in the next planting season to ensure that the completion criteria can be met.
5. Continue monitoring vegetation health and the effectiveness of remedial actions.

3.11 Reporting

A letter report addressing compliance with this management plan and results of the monitoring to demonstrate meeting the completion criteria will be prepared and retained as part of the records keeping required for the Clearing Permit after the completion criteria have been met.

4 REFERENCES

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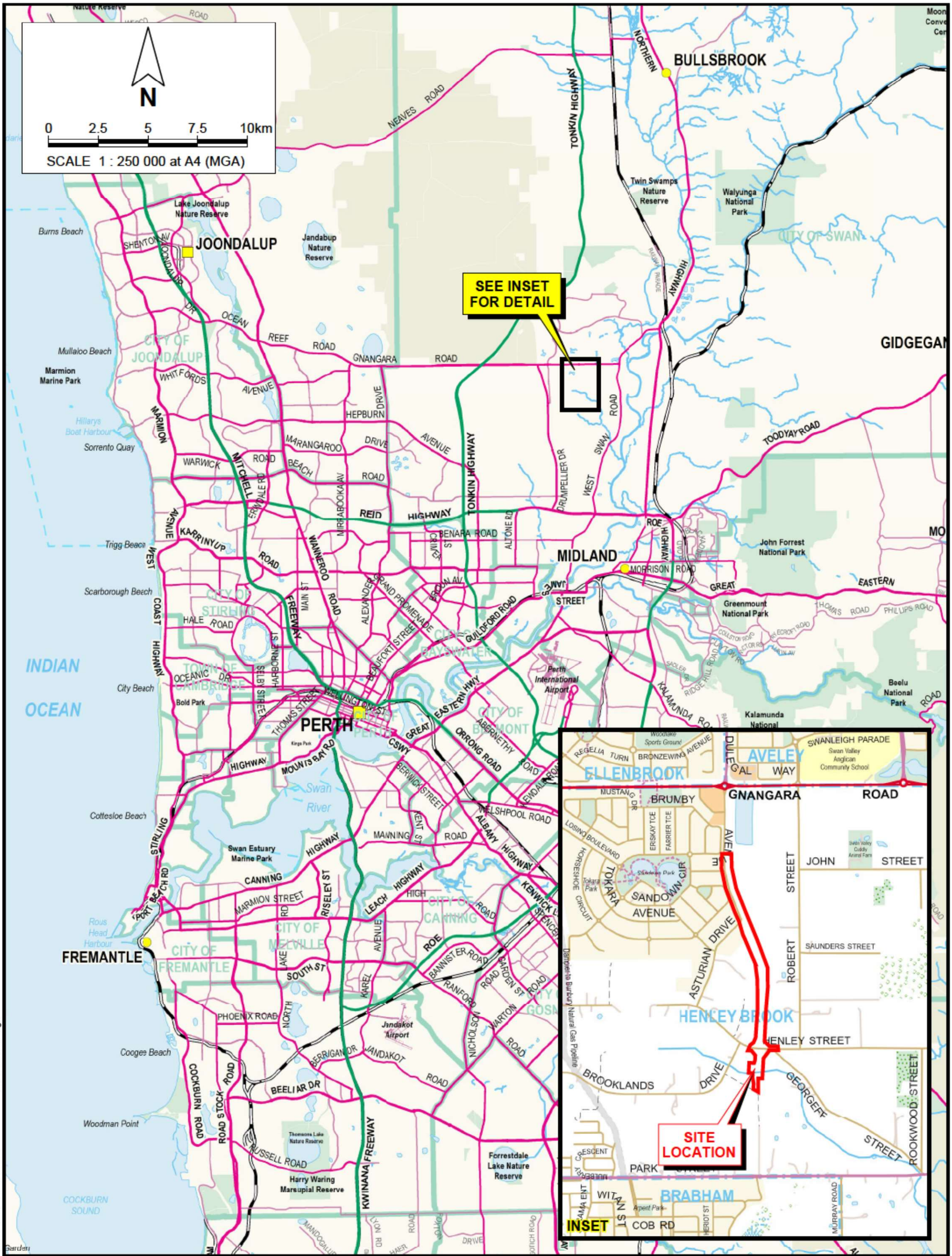
Landgate (2023) Historical Aerial Photography Accessed June 2023 https://www.landgate.wa.gov.au/bmvf/app/mapviewer/ Government of Western Australia,

Monash University (2014) *Vegetation Guidelines for Stormwater Biofilters within Southwest of Western Australia* Melbourne Victoria

National Map (2023) Map-Based Access to Spatial Data from Australian Government Agencies http://nationalmap.gov.au/#wa Accessed July 2023 Government of Australia

FIGURES



PINPOINT CARTOGRAPHICS (08) 9562 7136

2023-756-f01.dgn

pgv ENVIRONMENTAL

City of Swan
CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN
HENLEY BROOK AVENUE ROAD WORKS

Drawn: P. van der Moezel	Date: 23 Jun 2023
Job: 10542 Rpt: 2023-756	Revision: A

SITE LOCATION

Figure 1

PINPOINT CARTOGRAPHICS (08) 9562 7136 2023-756-f02.dgn

CADASTRAL SOURCE: Landgate, May 2023.
AERIAL PHOTOGRAPH SOURCE: NearMap, flown April 2023.

pgv ENVIRONMENTAL

City of Swan
CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN
HENLEY BROOK AVENUE ROAD WORKS

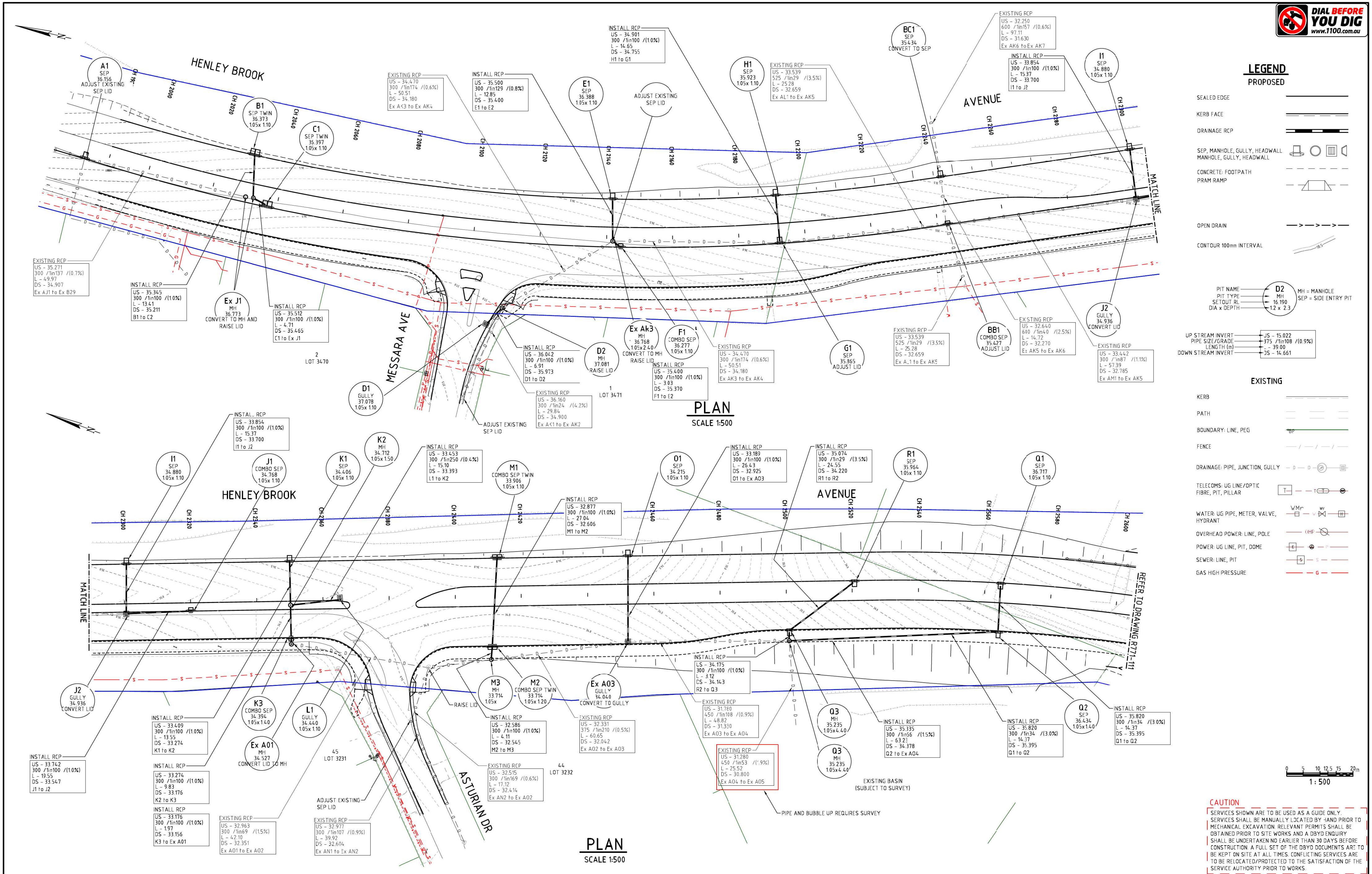
Drawn: P. van der Moezel	Date: 26 Jun 2023
Job: 10542 Rpt: 2023-756	Revision: A

SITE BOUNDARY AND TOPOGRAPHY

Figure 2

APPENDIX 1

Drainage Design



AUTHORISATION		APPROVED	
PROJECT MANAGER	DATE	DESIGN CO-ORDINATOR	DATE
DESIGNED D.WEERTS	CHECKED	DATE	DRAWN C.CAYATTE

REV	DATE	BY	DESCRIPTION
0	04.23	DW	ISSUED FOR CONSTRUCTION

AMENDMENTS

SCALE: 1:500 (A1)
DATUM: A.H.D.

HENLEY BROOK AVE - STAGE 3

MESSARA AVENUE TO PARK STREET
DUAL CARRIAGEWAY
DRAINAGE PLAN SHEET 1 OF 4

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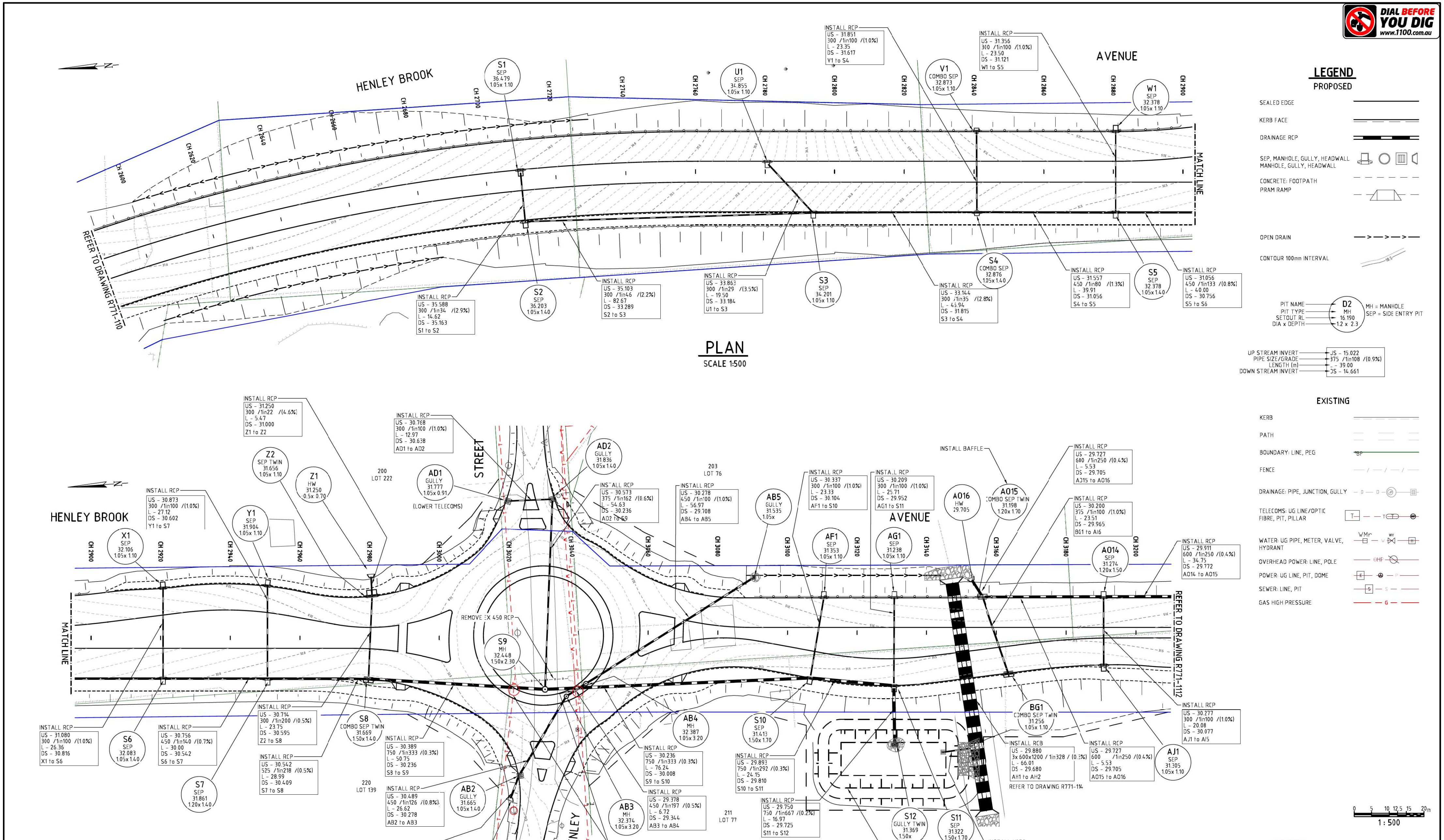

Pipe schedule (INSTALL labels on the plan; US, DS and L in m):

Install	Size / grade	US	L	DS	From–to
RCP	300 /1in34 /(2.9%)	35.588	14.62	35.163	S1 to S2
RCP	300 /1in46 /(2.2%)	35.103	82.67	33.289	S2 to S3
RCP	300 /1in29 /(3.5%)	33.863	19.50	33.184	U1 to S3
RCP	300 /1in35 /(2.8%)	33.144	45.94	31.815	S3 to S4
RCP	300 /1in100 /(1.0%)	31.851	23.35	31.617	V1 to S4
RCP	450 /1in80 /(1.3%)	31.557	39.91	31.056	S4 to S5
RCP	300 /1in100 /(1.0%)	31.356	23.50	31.121	W1 to S5
RCP	450 /1in133 /(0.8%)	31.056	40.00	30.756	S5 to S6
RCP	300 /1in100 /(1.0%)	31.080	26.36	30.816	X1 to S6
RCP	450 /1in140 /(0.7%)	30.756	30.00	30.542	S6 to S7
RCP	300 /1in100 /(1.0%)	30.873	27.12	30.602	Y1 to S7
RCP	525 /1in218 /(0.5%)	30.542	28.99	30.409	S7 to S8
RCP	300 /1in22 /(4.6%)	31.250	5.47	31.000	Z1 to Z2
RCP	300 /1in200 /(0.5%)	30.714	23.75	30.595	Z2 to S8
RCP	750 /1in333 /(0.3%)	30.389	50.75	30.236	S8 to S9
RCP	300 /1in100 /(1.0%)	30.768	12.97	30.638	AD1 to AD2
RCP	375 /1in162 /(0.6%)	30.573	54.63	30.236	AD2 to S9
RCP	750 /1in333 /(0.3%)	30.236	76.24	30.008	S9 to S10
RCP	450 /1in126 /(0.8%)	30.489	26.62	30.278	AB2 to AB3
RCP	450 /1in53 /(1.9%)	30.616	6.67	30.489	AB1 to AB2
RCP	450 /1in197 /(0.5%)	29.378	6.72	29.344	AB3 to AB4
RCP	450 /1in100 /(1.0%)	30.278	56.97	29.708	AB4 to AB5
RCP	750 /1in292 /(0.3%)	29.893	24.15	29.810	S10 to S11
RCP	750 /1in667 /(0.2%)	29.750	16.97	29.725	S11 to S12
RCP	300 /1in100 /(1.0%)	30.337	23.33	30.104	AF1 to S10
RCP	300 /1in100 /(1.0%)	30.209	25.71	29.952	AG1 to S11
RCP	600 /1in250 /(0.4%)	29.727	5.53	29.705	A015 to A016
RCP	375 /1in100 /(1.0%)	30.200	23.51	29.965	BG1 to A16
RCP	600 /1in250 /(0.4%)	29.911	34.75	29.772	A014 to A015
RCP	300 /1in100 /(1.0%)	30.277	20.08	30.077	AJ1 to A15
RCB	3x 600x1200 / 1in328 / (0.3%)	29.880	66.01	29.680	AH1 to AH2
RCP	600 /1in250 /(0.4%)	29.727	5.53	29.705	A015 to A016
HDPE	300 /1in80 /(1.3%)	29.924	8.00	29.824	BF1 to BF2

CAUTION
SERVICES SHOWN ARE TO BE USED AS A GUIDE ONLY. SERVICES SHALL BE MANUALLY LOCATED BY HAND PRIOR TO MECHANICAL EXCAVATION. RELEVANT PERMITS SHALL BE OBTAINED PRIOR TO SITE WORKS AND A DBYD ENQUIRY SHALL BE UNDERTAKEN NO EARLIER THAN 30 DAYS BEFORE CONSTRUCTION. A FULL SET OF THE DBYD DOCUMENTS ARE TO BE KEPT ON SITE AT ALL TIMES. CONFLICTING SERVICES ARE TO BE RELOCATED/PROTECTED TO THE SATISFACTION OF THE SERVICE AUTHORITY PRIOR TO WORKS.

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DATUM: A.H.D.

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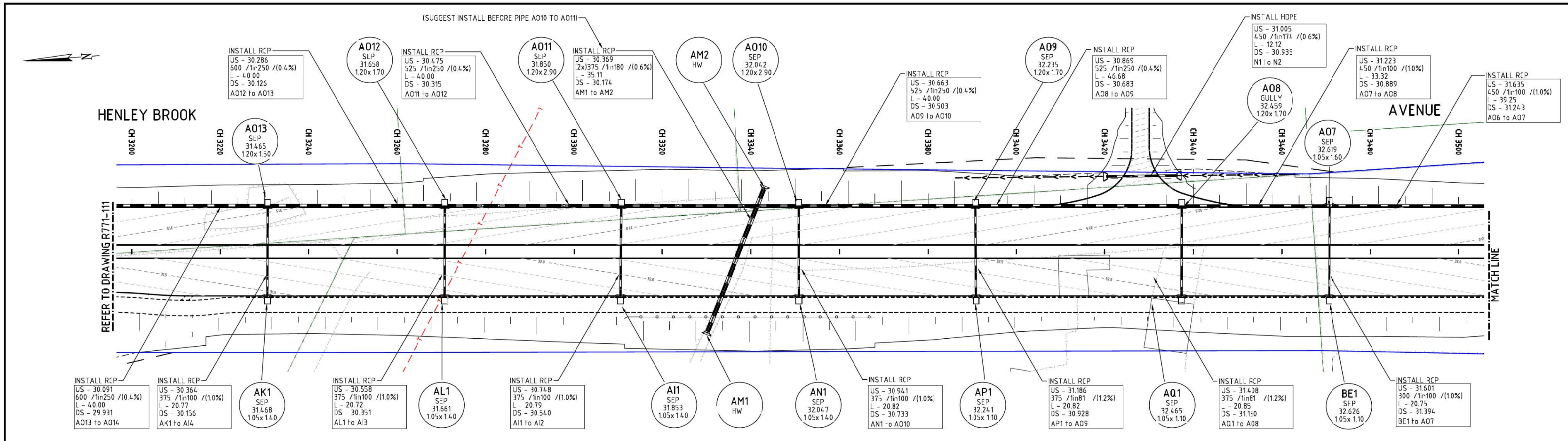

PLAN
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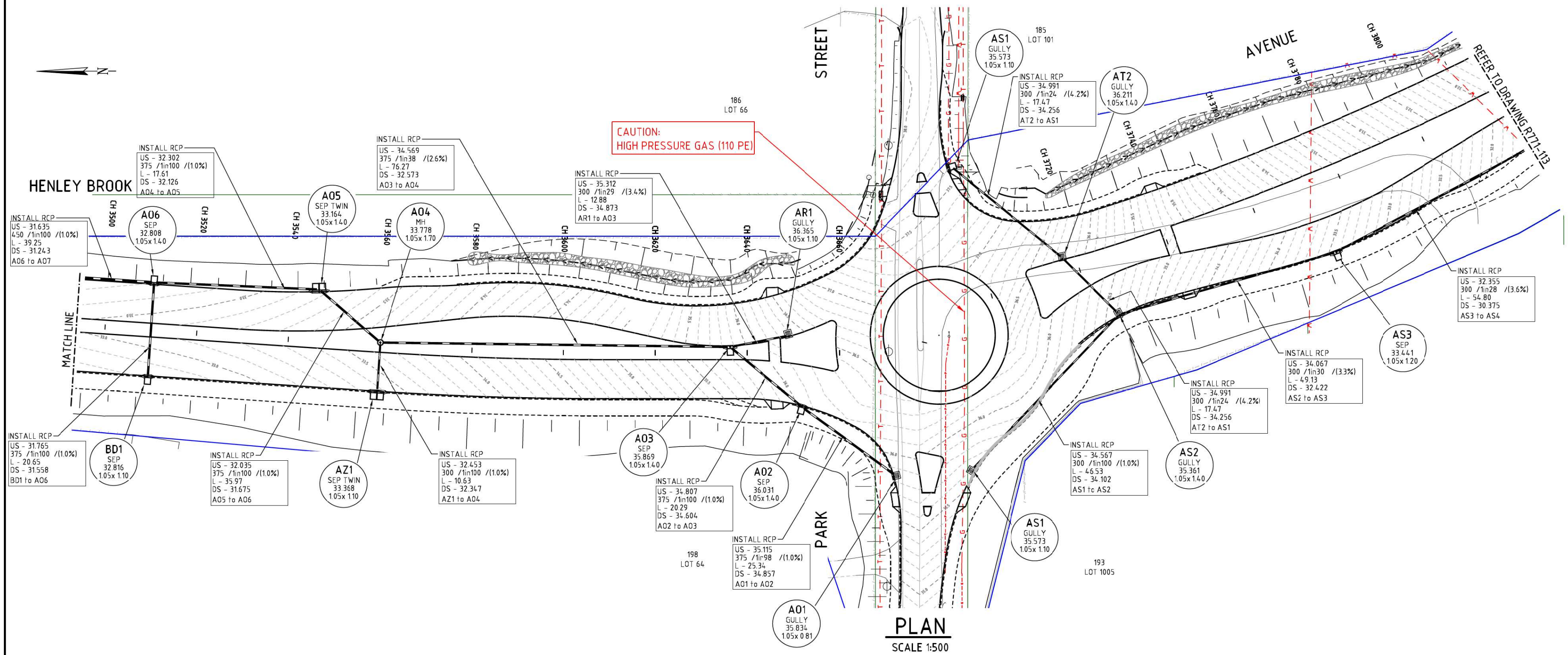

PLAN
SCALE 1:500

LEGEND
PROPOSED

- SEALED EDGE
- KERB FACE
- DRAINAGE RCP
- SEP, MANHOLE, GULLY, HEADWALL / MANHOLE, GULLY, HEADWALL
- CONCRETE: FOOTPATH / PRAM RAMP
- OPEN DRAIN
- CONTOUR 100mm INTERVAL

PIT NAME / PIT TYPE / SETOUT RL / DIA x DEPTH — D2 / MH / 16.190 / 1.2 x 2.3
MH = MANHOLE
SEP = SIDE ENTRY PIT

UP STREAM INVERT / PIPE SIZE/GRADE / LENGTH (m) / DOWN STREAM INVERT — US - 15.022 / 375 /1in108 /(0.9%) / L - 39.00 / DS - 14.661

EXISTING

- KERB
- PATH
- BOUNDARY: LINE, PEG
- FENCE
- DRAINAGE: PIPE, JUNCTION, GULLY
- TELECOMS: UG LINE/OPTIC FIBRE, PIT, PILLAR
- WATER: UG PIPE, METER, VALVE, HYDRANT
- OVERHEAD POWER: LINE, POLE
- POWER: UG LINE, PIT, DOME
- SEWER: LINE, PIT
- GAS HIGH PRESSURE

0 5 10 12.5 15 20m
1:500

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HENLEY BROOK AVE - STAGE 3
MESSARA AVENUE TO PARK STREET
DUAL CARRIAGEWAY
DRAINAGE PLAN SHEET 3 OF 4

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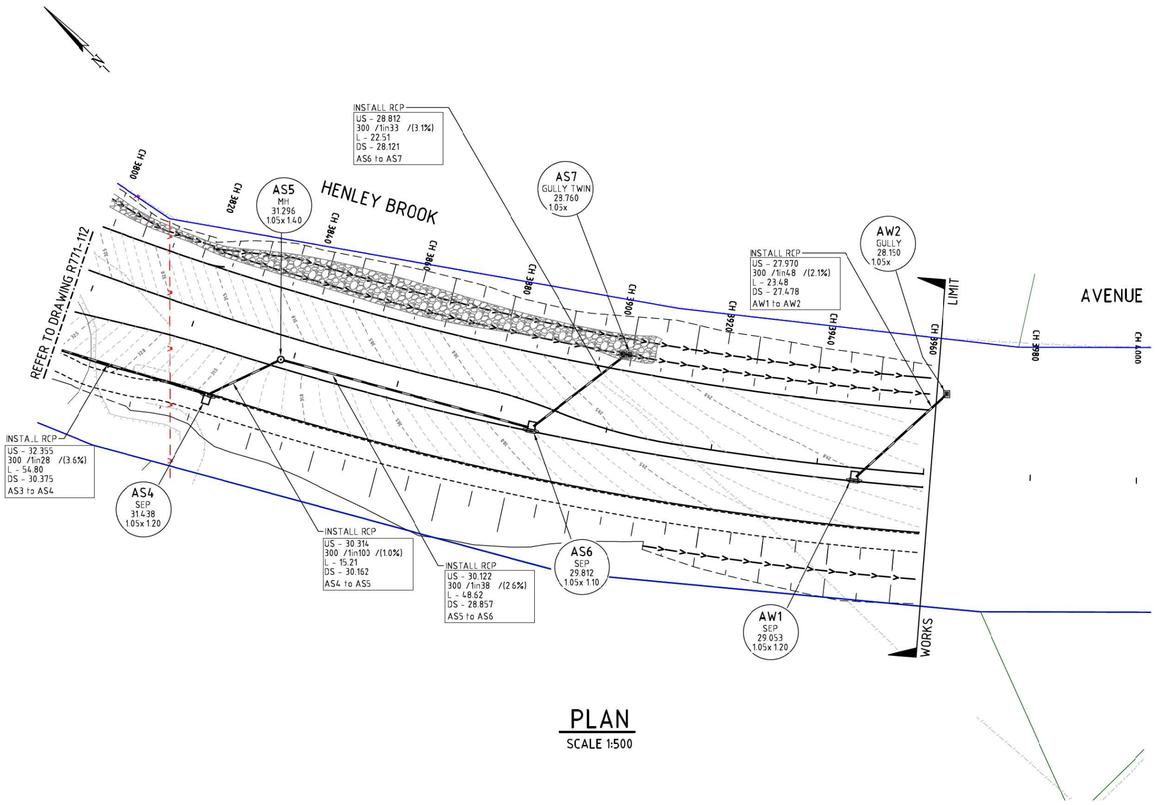

PLAN
SCALE 1:500

LEGEND
PROPOSED

- SEALED EDGE
- KERB FACE
- DRAINAGE RCP
- SEP, MANHOLE, GULLY, HEADWALL / MANHOLE, GULLY, HEADWALL
- CONCRETE: FOOTPATH
- PRAM RAMP
- OPEN DRAIN
- CONTOUR 100mm INTERVAL

PIT NAME — D2; PIT TYPE — MH; SETOUT RL — 16.190; DIA x DEPTH — 1.2 x 2.3
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UP STREAM INVERT — US - 15.022
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LENGTH (m) — L - 39.00
DOWN STREAM INVERT — DS - 14.661

EXISTING

- KERB
- PATH
- BOUNDARY: LINE, PEG
- FENCE
- DRAINAGE: PIPE, JUNCTION, GULLY
- TELECOMS: UG LINE/OPTIC FIBRE, PIT, PILLAR
- WATER: UG PIPE, METER, VALVE, HYDRANT
- OVERHEAD POWER: LINE, POLE
- POWER: UG LINE, PIT, DOME
- SEWER: LINE, PIT
- GAS HIGH PRESSURE

0 5 10 12.5 15 20m
1 : 500

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REV	DATE	BY	DESCRIPTION
0	04.23	DW	ISSUED FOR CONSTRUCTION

AMENDMENTS

AUTHORISATION		APPROVED	
PROJECT MANAGER	DATE	DESIGN CO-ORDINATOR	DATE
DESIGNED D.WEERTS	CHECKED	DATE	DRAWN C.CAYATTE

SCALE: 1:500 (A1)
DATUM: A.H.D.

HENLEY BROOK AVE - STAGE 3
MESSARA AVENUE TO PARK STREET
DUAL CARRIAGEWAY
DRAINAGE PLAN SHEET 4 OF 4

PROFORMCIVIL ENGINEERING GROUP www.proformcivil.com

city of swan

DRAWING No: R771-113
REV No: 0

OPERATIONS

NOTES:

1. ALL CONCRETE PRODUCTS TO COMPLY WITH AS 3610 FORM WORK FOR CONCRETE AND AS 3600 - CONCRETE STRUCTURES.

2. BOX CULVERTS:

2.1. ARE TO BE MANUFACTURED AND INSTALLED AS PER AS1597 AUSTRALIAN STANDARDS FOR PRECAST REINFORCED CONCRETE BOX CULVERTS.

2.2. PRECAST BASE SLABS SHALL BE SUPPORTED ON A BED ZONE OF 150mm THICK GRAVEL BACKFILL CEMENT STABILISED TO 5%, A 50mm THICK COMPACTED SCREED SAND LAYER AND GEOFABRIC (REFER TO TYPICAL DETAIL).

2.3. PRECAST CROWN UNITS SHALL BE PLACED ON A BED OF MORTAR IN THE RECESSES IN THE BASE SLAB. ANY GAPS BETWEEN THE SIDE WALLS AND THE SIDES OF THE RECESSES SHALL BE PACKED WITH CEMENT MORTAR. LIFTING HOLES AND BUTT JOINTS BETWEEN THE ENDS OF UNITS SHALL BE PACKED OR SEALED WITH CEMENT MORTAR OR GROUT OF A CONSISTENCY THAT ENSURES FILLING OF THE VOID.

2.4. STEEL LIFTING HOOKS SHALL BE CUT FLUSH WITH THE SURFACE OF THE CONCRETE, CLEANED TO BRIGHT METAL AND COATED WITH TWO COATS OF COAL TAR EPOXY OR EQUIVALENT APPROVED BY THE SUPERINTENDENT. ALTERNATIVELY, THEY SHALL BE SEALED WITH EPOXY MORTAR.

2.5. THE GAP BETWEEN MULTI CELL CULVERTS, TYPICALLY 15mm, SHALL BE PROVIDED BETWEEN ADJACENT CELLS. THIS GAP SHALL BE FILLED WITH CEMENT MORTAR OR GROUT. ALTERNATIVELY GAPS CAN BE COVERED WITH A 150mm WIDE BITUMASTIC PRIMER AND TAPE OR A GEOFABRIC MEMBRANE SUITABLY PLACED ACROSS THE SPAN OF THE CULVERTS.

2.6. ALL MORTAR JOINTS SHALL BE PROTECTED FROM THE SUN AND CURED IN AN APPROVED MANNER FOR NOT LESS THAN 48 HOURS.

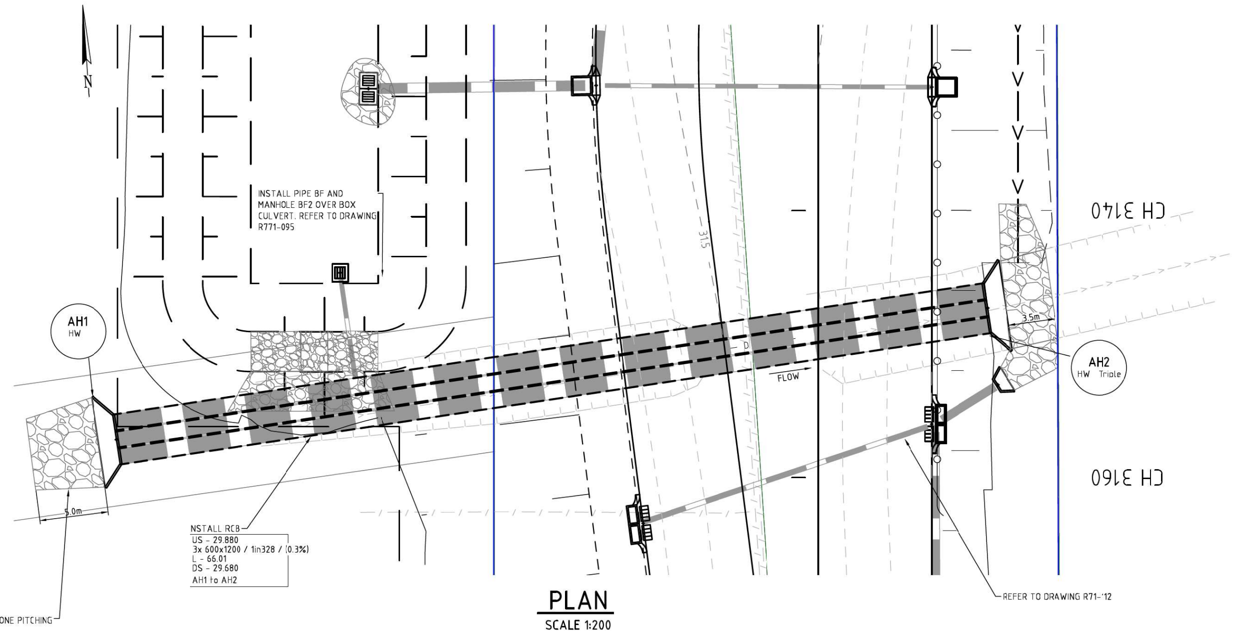
2.7. ALL EXTERNAL SURFACES OF JOINTS BETWEEN PRECAST CROWN UNITS, BOTH LATERALLY AND LONGITUDINALLY, SHALL BE COVERED FULL LENGTH, AND MINIMUM 250mm WIDTH, WITH STRIPS OF NON-WOVEN GEOTEXTILE OF MINIMUM MASS 270 GRAMS PER SQUARE METRE IN ACCORDANCE WITH AUSTROADS GUIDE TO GEOTEXTILES.

3. FOUNDATION & BACKFILL

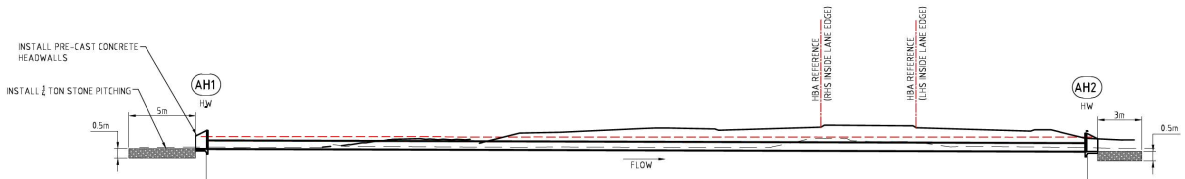
3.1. ALL SOFT, YIELDING OR UNSUITABLE MATERIAL SHALL BE REMOVED FROM THE FOUNDATION AND REPLACED WITH ORDINARY BACKFILL MATERIAL AS DIRECTED BY THE SUPERINTENDENT

3.2. CEMENT STABILISED BACKFILL MATERIAL SHALL CONSIST OF BASECOURSE MATERIAL, OR OTHER SUITABLE MATERIAL APPROVED BY THE SUPERINTENDENT, STABILISED IN THE PROPORTION OF 100KG OF TYPE GP CEMENT TO ONE CUBIC METRE OF UNCOMPACTED BACKFILL MATERIAL

3.3. EXCAVATIONS SHALL BE KEPT FREE FROM WATER UNTIL WORK BELOW GROUND LEVEL IS SUFFICIENTLY SET OR PROTECTED



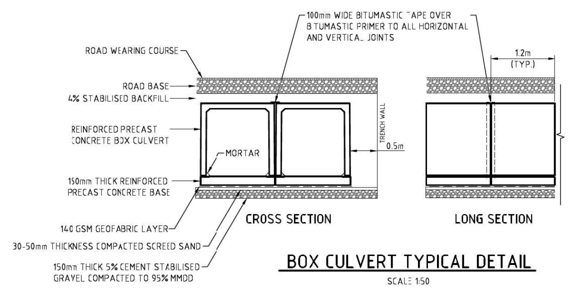
PLAN
SCALE 1:200



Diameter (mm) — (3x)x600 dia
Pipe Grade (%) — 0.31%
Design Flow (Q10 Cumecs) — Q=1.2
Pipe Velocity (Q10 Flow) — 0.63m/s
DATUM RL 21.00

HGL 10 YEAR	30.80	30.78		30.74
INVERT LEVEL		29.88	29.68	29.48
DEPTH TO INVERT	1.20	1.00	1.00	1.20
DESIGN SURFACE	30.88		30.68	
NATURAL SURFACE	30.00		29.96	
RUNNING CHAINAGE	0.00		66.01	

PROFILE
SCALE 1:200



BOX CULVERT TYPICAL DETAIL
SCALE 1:50

0 2 4 5 6 8m
1 : 200

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REV	DATE	BY	DESCRIPTION
0	04.23	DW	ISSUED FOR CONSTRUCTION

AMENDMENTS

AUTHORISATION — PROJECT MANAGER / DATE
APPROVED — DESIGN CO-ORDINATOR / DATE
DESIGNED D.WEERTS — CHECKED — DATE — DRAWN C.CAYATTE

SCALE: 1:200 (A1)
DATUM: A.H.D.

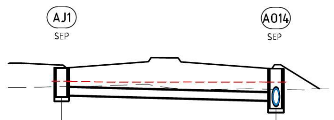
HENLEY BROOK AVE - STAGE 3
MESSARA AVENUE TO PARK STREET
DUAL CARRIAGEWAY
DRAINAGE PROFILES SHEET 1 OF 7

PROFORMCIVIL ENGINEERING GROUP www.proformcivil.com

city of swan

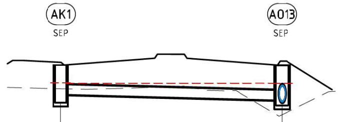
DRAWING No: R771-114
REV No: 0

OPERATIONS



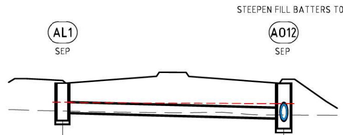
	AJ1		AO14	
Diameter (mm)	300 dia			
Pipe Grade (%)	1%			
Design Flow (Q10 Cumecs)	Q=0.02			
Pipe Velocity (Q10 Flow)	0.22m/s			
DATUM RL	26.00			
HGL 10 YEAR	30.80	30.78	30.78	30.77
INVERT LEVEL		30.28	30.08	29.91
DEPTH TO INVERT	1.10	1.03	1.20 1.50	1.36
DESIGN SURFACE	31.30		31.27	
NATURAL SURFACE	30.61		30.50	
RUNNING CHAINAGE	-6.93		13.15	

PROFILE DRAINAGE PIPE AJ



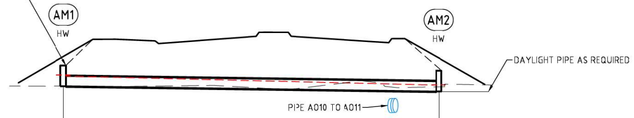
	AK1		AO13	
Diameter (mm)	375 dia			
Pipe Grade (%)	1%			
Design Flow (Q10 Cumecs)	Q=0.02			
Pipe Velocity (Q10 Flow)	0.15m/s			
DATUM RL	26.00			
HGL 10 YEAR	30.81	30.80	30.80	30.79
INVERT LEVEL		30.36	30.16	30.09
DEPTH TO INVERT	1.40	1.10	1.31 1.50	1.37
DESIGN SURFACE	31.47		31.46	
NATURAL SURFACE	30.58		29.62	
RUNNING CHAINAGE	-6.93		13.84	

PROFILE DRAINAGE PIPE AK



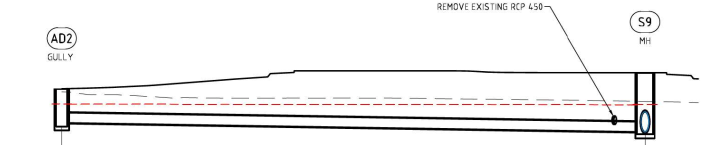
	AL1		AO12	
Diameter (mm)	375 dia			
Pipe Grade (%)	1%			
Design Flow (Q10 Cumecs)	Q=0.02			
Pipe Velocity (Q10 Flow)	0.15m/s			
DATUM RL	26.00			
HGL 10 YEAR	30.94	30.93	30.90	30.89
INVERT LEVEL		30.56	30.35	30.29
DEPTH TO INVERT	1.40	1.10	1.31 1.70	1.37
DESIGN SURFACE	31.66		31.66	
NATURAL SURFACE	30.62		30.47	
RUNNING CHAINAGE	-6.93		13.79	

PROFILE DRAINAGE PIPE AL



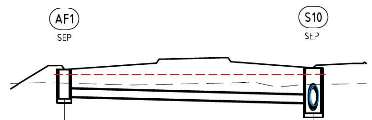
	AM1		AM2	
Diameter (mm)	(2x)375 dia			
Pipe Grade (%)	0.56%			
Design Flow (Q10 Cumecs)	Q=0.21			
Pipe Velocity (Q10 Flow)	0.94m/s			
DATUM RL	26.00			
HGL 10 YEAR	30.79	30.74		30.41
INVERT LEVEL		30.37	30.17	30.17
DEPTH TO INVERT		0.77		0.77
DESIGN SURFACE	31.14		30.95	
NATURAL SURFACE	30.37		30.34	
RUNNING CHAINAGE	0.00		35.11	

PROFILE DRAINAGE PIPE AM



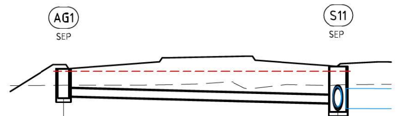
	AD2		S9	
Diameter (mm)	375 dia			
Pipe Grade (%)	0.62%			
Design Flow (Q10 Cumecs)	Q=0.04			
Pipe Velocity (Q10 Flow)	0.33m/s			
DATUM RL	27.00			
HGL 10 YEAR	31.29	31.27	31.25 31.26	31.22
INVERT LEVEL	30.64	30.57	30.24	30.24
DEPTH TO INVERT	1.20 1.40	1.26	2.30	2.21
DESIGN SURFACE	31.84		32.45	
NATURAL SURFACE	31.73		31.37	
RUNNING CHAINAGE	12.97		67.60	

PROFILE DRAINAGE PIPE AD



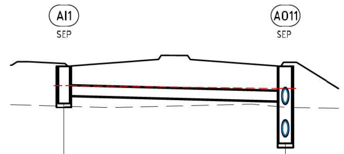
	AF1		S10	
Diameter (mm)	300 dia			
Pipe Grade (%)	1%			
Design Flow (Q10 Cumecs)	Q=0			
Pipe Velocity (Q10 Flow)	0m/s			
DATUM RL	26.00			
HGL 10 YEAR		31.17	31.17	31.15
INVERT LEVEL		30.34	30.10	29.89
DEPTH TO INVERT	1.10	1.02	1.31 1.70	1.52
DESIGN SURFACE	31.35		31.41	
NATURAL SURFACE	30.84		30.79	
RUNNING CHAINAGE	-6.93		16.40	

PROFILE DRAINAGE PIPE AF



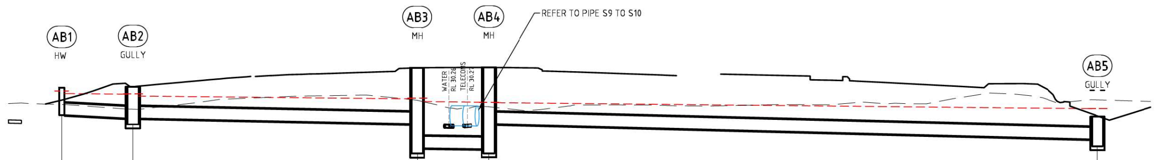
	AG1		S11	
Diameter (mm)	300 dia			
Pipe Grade (%)	1%			
Design Flow (Q10 Cumecs)	Q=0			
Pipe Velocity (Q10 Flow)	0m/s			
DATUM RL	26.00			
HGL 10 YEAR		31.14	31.14 31.15	31.10
INVERT LEVEL		30.21	29.55	29.75
DEPTH TO INVERT	1.10	1.03	1.37 1.70	1.57
DESIGN SURFACE	31.24		31.32	
NATURAL SURFACE	30.62		30.63	
RUNNING CHAINAGE	-6.93		18.78	

PROFILE DRAINAGE PIPE AG



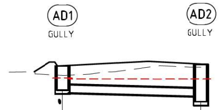
	AI1		AO11	
Diameter (mm)	375 dia			
Pipe Grade (%)	1%			
Design Flow (Q10 Cumecs)	Q=0.02			
Pipe Velocity (Q10 Flow)	0.15m/s			
DATUM RL	26.00			
HGL 10 YEAR		31.12	31.02	31.00
INVERT LEVEL		30.75	30.54	30.48
DEPTH TO INVERT	1.40	1.10	1.31 2.90	1.37
DESIGN SURFACE	31.85		31.85	
NATURAL SURFACE	30.35		30.31	
RUNNING CHAINAGE	-84.15		-63.35	

PROFILE DRAINAGE PIPE AI



	AB1		AB2		AB3		AB4		AB5	
Diameter (mm)	450 dia		450 dia		450 dia		450 dia			
Pipe Grade (%)	1.9%		0.79%		0.51%		1%			
Design Flow (Q10 Cumecs)	Q=0.18		Q=0.18		Q=0.18		Q=0.18			
Pipe Velocity (Q10 Flow)	1.12m/s		1.13m/s		1.13m/s		1.13m/s			
DATUM RL	26.00									
HGL 10 YEAR	31.51	31.42	31.39 31.40	31.32	31.22 31.24	31.12	31.09	31.08	30.85	
INVERT LEVEL		30.62	30.49	30.49	30.28	29.38	29.34	30.28	29.71	29.45
DEPTH TO INVERT		1.02	1.40	1.18	2.10 3.20	3.00	3.04 3.20	2.11	0.84	1.10
DESIGN SURFACE	31.63		31.66		32.37		32.39		30.55	
NATURAL SURFACE	31.01		30.83		31.16		30.92		31.18	
RUNNING CHAINAGE	0.00		6.67		33.29		40.02		96.98	

PROFILE DRAINAGE PIPE AB



	AD1		AD2
Diameter (mm)	300 dia		
Pipe Grade (%)	1%		
Design Flow (Q10 Cumecs)	Q=0.02		
Pipe Velocity (Q10 Flow)	0.29m/s		
DATUM RL	27.00		
HGL 10 YEAR	31.32	31.29	31.29
INVERT LEVEL		30.77	30.54
DEPTH TO INVERT	0.91	1.01	1.20 1.40
DESIGN SURFACE	31.78		31.84
NATURAL SURFACE	31.42		31.73
RUNNING CHAINAGE	0.00		12.97

PROFILE DRAINAGE PIPE AD

0 2.5 5 6.25 7.5 10m
1 : 250

0 1 2 2.5 3 4m
1 : 100

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AMENDMENTS

AUTHORISATION | APPROVED
PROJECT MANAGER — DATE | DESIGN CO-ORDINATOR — DATE
DESIGNED D.WEERTS — CHECKED — DATE — DRAWN C.CAYATTE

SCALE: H - 1:250 V - 1:100 (A1)
DATUM: A.H.D.

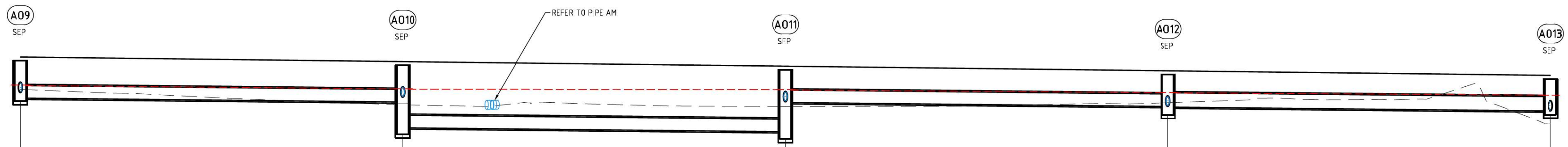
HENLEY BROOK AVE - STAGE 3
MESSARA AVENUE TO PARK STREET
DUAL CARRIAGEWAY
DRAINAGE PROFILES SHEET 2 OF 7

PROFORMCIVIL ENGINEERING GROUP www.proformcivil.com

city of swan

DRAWING No: R771-115
REV No: 0

OPERATIONS

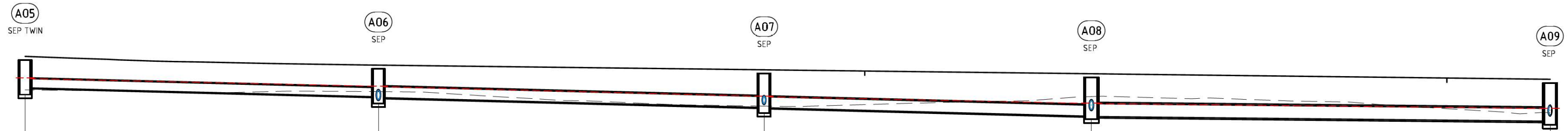


Diameter (mm) / Pipe Grade (%) / Design Flow (Q10 Cumecs) / Pipe Velocity (Q10 Flow)	A09 to A010	A010 to A011	A011 to A012	A012 to A013
	525 dia, 0.4%, Q=0.09, 0.44m/s	525 dia, 0.4%, Q=0.1, 0.44m/s	525 dia, 0.4%, Q=0.1, 0.45m/s	600 dia, 0.4%, Q=0.1, 0.35m/s

DATUM RL 26.00

	A09		A010		A011		A012		A013
HGL 10 YEAR	31.20	31.19	31.05	31.03	31.02	31.00	30.90	30.89	30.80
INVERT LEVEL	30.68	30.66	30.50	29.42	29.26	30.48	30.32	30.29	30.13
DEPTH TO INVERT	1.55 / 1.70	1.57	1.54 / 2.90	2.62	2.59 / 2.90	1.37	1.34 / 1.70	1.37	1.34 / 1.50
DESIGN SURFACE	32.23		32.04		31.85		31.66		31.46
NATURAL SURFACE	31.03		30.43		30.31		30.47		29.62
RUNNING CHAINAGE	5.37		45.37		85.37		125.37		165.37

PROFILE DRAINAGE PIPE AO

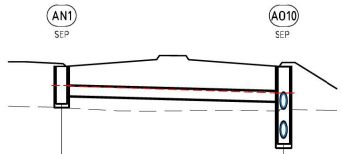


Diameter (mm) / Pipe Grade (%) / Design Flow (Q10 Cumecs) / Pipe Velocity (Q10 Flow)	A05 to A06	A06 to A07	A07 to A08	A08 to A09
	375 dia, 1%, Q=0.05, 0.48m/s	450 dia, 1%, Q=0.07, 0.47m/s	450 dia, 1%, Q=0.09, 0.54m/s	525 dia, 0.4%, Q=0.09, 0.43m/s

DATUM RL 27.00

	A05		A06		A07		A08		A09
HGL 10 YEAR	32.43 / 32.44	32.41	32.11 / 32.11	32.09	31.70 / 31.71	31.67	31.41	31.39	31.20
INVERT LEVEL	32.13	32.03	31.68	31.64	31.24	31.22	30.89	30.87	30.68
DEPTH TO INVERT	1.04 / 1.40	1.13	1.13 / 1.40	1.17	1.38 / 1.60	1.40	1.57 / 1.70	1.59	1.55 / 1.70
DESIGN SURFACE	33.16		32.81		32.62		32.46		32.23
NATURAL SURFACE	31.95		31.88		31.30		31.68		31.03
RUNNING CHAINAGE	-149.85		-113.88		-74.63		-41.31		5.37

PROFILE DRAINAGE PIPE AO

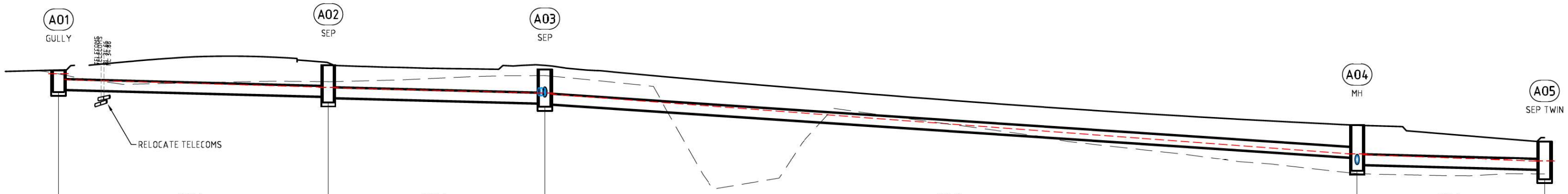


Diameter (mm) / Pipe Grade (%) / Design Flow (Q10 Cumecs) / Pipe Velocity (Q10 Flow)	AN1 to A010
	375 dia, 1%, Q=0.02, 0.15m/s

DATUM RL 26.00

	AN1		A010	
HGL 10 YEAR	31.33	31.32	31.05	31.03
INVERT LEVEL		30.94	30.73	29.42
DEPTH TO INVERT	1.40	1.11	1.31 / 2.90	2.62
DESIGN SURFACE	32.05		32.04	
NATURAL SURFACE	30.50		30.43	
RUNNING CHAINAGE	-6.93		13.89	

PROFILE DRAINAGE PIPE AN



Diameter (mm) / Pipe Grade (%) / Design Flow (Q10 Cumecs) / Pipe Velocity (Q10 Flow)	A01 to A02	A02 to A03	A03 to A04	A04 to A05
	375 dia, 1.02%, Q=0.07, 0.67m/s	375 dia, 1%, Q=0.07, 0.63m/s	375 dia, 2.62%, Q=0.07, 0.61m/s	375 dia, 1%, Q=0.05, 0.49m/s

DATUM RL 29.00

	A01		A02		A03		A04		A05
HGL 10 YEAR	35.70	35.49	35.21	35.18	34.98 / 34.99	34.94	32.71	32.68	32.43 / 32.44
INVERT LEVEL		35.11	34.86	34.81	34.60	34.57	32.57	32.30	32.13
DEPTH TO INVERT	0.81	0.72	1.17 / 1.40	1.22	1.26 / 1.40	1.30	1.21 / 1.70	1.48	1.04 / 1.40
DESIGN SURFACE	35.83		36.03		35.87		33.78		33.16
NATURAL SURFACE	35.70		35.41		35.64		31.97		31.95
RUNNING CHAINAGE	-289.37		-264.03		-243.73		-167.47		

PROFILE DRAINAGE PIPE AO

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0	04.23	DW	ISSUED FOR CONSTRUCTION

AUTHORISATION
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DESIGNED D.WEERTS | CHECKED

APPROVED
DESIGN CO-ORDINATOR | DATE
DATE | DRAWN C.CAYATTE

SCALE: (A1)
DATUM: A.H.D.

HENLEY BROOK AVE - STAGE 3

MESSARA AVENUE TO PARK STREET

DUAL CARRIAGEWAY

DRAINAGE PROFILES SHEET 3 OF 7

PROFORMCIVIL ENGINEERING GROUP
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city of swan

DRAWING No: R771-116
REV No: 0

OPERATIONS

DIAL BEFORE YOU DIG
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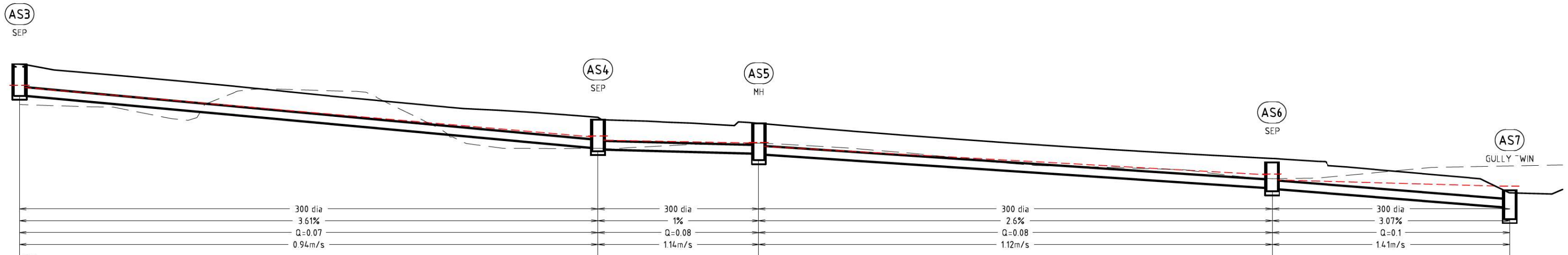
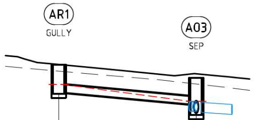


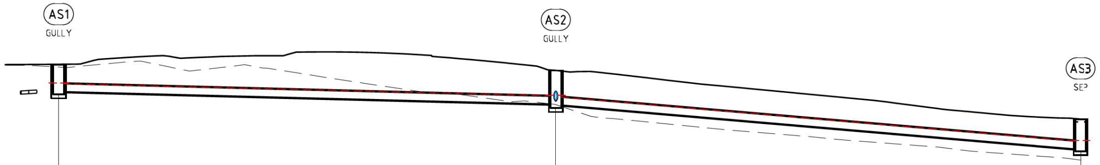
	AS3		AS4		AS5		AS6		AS7
Diameter (mm)		300 dia		300 dia		300 dia		300 dia	
Pipe Grade (%)		3.61%		1%		2.6%		3.07%	
Design Flow (Q10 Cumecs)		Q=0.07		Q=0.08		Q=0.08		Q=0.1	
Pipe Velocity (Q10 Flow)		0.94m/s		1.14m/s		1.12m/s		1.41m/s	
DATUM RL 26.00									
HGL 10 YEAR	32.72 / 32.74	32.66	30.78 / 30.81	30.66	30.55 / 30.57	30.42	29.35 / 29.38	29.15	28.91
INVERT LEVEL	32.42	32.36	30.37	30.31	30.16	30.12	28.86	28.81	28.12 / 27.66
DEPTH TO INVERT	1.12 / 1.20	1.19	1.06 / 1.20	1.12	1.13 / 1.40	1.17	0.96 / 1.10	1.00	0.64 / 1.10
DESIGN SURFACE	33.54		31.44		31.30		29.81		28.76
NATURAL SURFACE	32.01		30.35		30.55		29.20		29.68
RUNNING CHAINAGE	-65.32		-10.53		4.68		53.30		75.81

PROFILE DRAINAGE PIPE AS



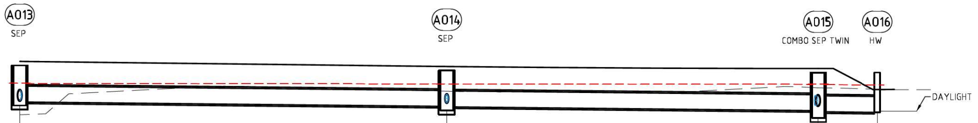
	AR1		AO3
Diameter (mm)		300 dia	
Pipe Grade (%)		3.41%	
Design Flow (Q10 Cumecs)		Q=0.01	
Pipe Velocity (Q10 Flow)		0.07m/s	
DATUM RL 31.00			
HGL 10 YEAR		35.61	34.98 / 34.99 / 34.94
INVERT LEVEL		35.31	34.87 / 34.57
DEPTH TO INVERT	1.10	1.05	1.00 / 1.40 / 1.30
DESIGN SURFACE	36.37		35.87
NATURAL SURFACE	36.12		35.64
RUNNING CHAINAGE	0.00		12.88

PROFILE DRAINAGE PIPE AR



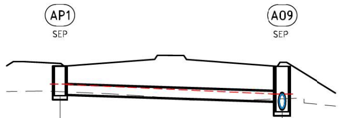
	AS1		AS2		AS3
Diameter (mm)		300 dia		300 dia	
Pipe Grade (%)		1%		3.35%	
Design Flow (Q10 Cumecs)		Q=0.02		Q=0.05	
Pipe Velocity (Q10 Flow)		0.27m/s		0.73m/s	
DATUM RL 28.00					
HGL 10 YEAR	34.90	34.87	34.42 / 34.43	34.37	32.72 / 32.74
INVERT LEVEL		34.57	34.10	34.07	32.42
DEPTH TO INVERT	1.10	1.01	1.26 / 1.40	1.29	1.12 / 1.20
DESIGN SURFACE	35.57		35.36		33.54
NATURAL SURFACE	35.49		34.09		32.01
RUNNING CHAINAGE	-160.98		-114.46		-65.32

PROFILE DRAINAGE PIPE AS



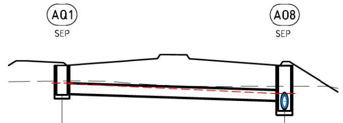
	AO13		AO14		AO15		AO16
Diameter (mm)		600 dia		600 dia		600 dia	
Pipe Grade (%)		0.4%		0.4%		0.4%	
Design Flow (Q10 Cumecs)		Q=0.1		Q=0.1		Q=0.11	
Pipe Velocity (Q10 Flow)		0.36m/s		0.36m/s		0.4m/s	
DATUM RL 26.00							
HGL 10 YEAR	30.80	30.79	30.78	30.77	30.76	30.74	30.74
INVERT LEVEL	30.13	30.09	29.93	29.91	29.77	29.73	29.71 / 29.71
DEPTH TO INVERT	1.34 / 1.50	1.37	1.34 / 1.50	1.36	1.43 / 1.70	1.47	1.49
DESIGN SURFACE	31.46		31.27		31.20		31.20
NATURAL SURFACE	29.62		30.50		30.63		30.57
RUNNING CHAINAGE	165.37		205.37		240.12		245.66

PROFILE DRAINAGE PIPE AO



	AP1		AO9
Diameter (mm)		375 dia	
Pipe Grade (%)		1.24%	
Design Flow (Q10 Cumecs)		Q=0.02	
Pipe Velocity (Q10 Flow)		0.16m/s	
DATUM RL 27.00			
HGL 10 YEAR	31.57	31.56	31.20 / 31.19
INVERT LEVEL		31.19	30.93 / 30.66
DEPTH TO INVERT	1.10	1.06	1.31 / 1.70 / 1.57
DESIGN SURFACE	32.24		32.23
NATURAL SURFACE	31.29		31.03
RUNNING CHAINAGE	-6.93		13.89

PROFILE DRAINAGE PIPE AP



	AQ1		AQ8
Diameter (mm)		375 dia	
Pipe Grade (%)		1.24%	
Design Flow (Q10 Cumecs)		Q=0.02	
Pipe Velocity (Q10 Flow)		0.18m/s	
DATUM RL 27.00			
HGL 10 YEAR	31.80	31.78	31.41 / 31.39
INVERT LEVEL		31.41	31.15 / 30.87
DEPTH TO INVERT	1.10	1.06	1.31 / 1.70 / 1.59
DESIGN SURFACE	32.47		32.46
NATURAL SURFACE	31.88		31.68
RUNNING CHAINAGE	-6.93		13.92

PROFILE DRAINAGE PIPE AQ

CAUTION
SERVICES SHOWN ARE TO BE USED AS A GUIDE ONLY. SERVICES SHALL BE MANUALLY LOCATED BY HAND PRIOR TO MECHANICAL EXCAVATION. RELEVANT PERMITS SHALL BE OBTAINED PRIOR TO SITE WORKS AND A DBYD ENQUIRY SHALL BE UNDERTAKEN NO EARLIER THAN 30 DAYS BEFORE CONSTRUCTION. A FULL SET OF THE DBYD DOCUMENTS ARE TO BE KEPT ON SITE AT ALL TIMES. CONFLICTING SERVICES ARE TO BE RELOCATED/PROTECTED TO THE SATISFACTION OF THE SERVICE AUTHORITY PRIOR TO WORKS.

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0	04.23	DW	ISSUED FOR CONSTRUCTION

AUTHORISATION
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DESIGNED D.WEERTS — CHECKED — DATE

APPROVED
DESIGN CO-ORDINATOR — DATE
DRAWN C.CAYATTE

SCALE: (A1)
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HENLEY BROOK AVE - STAGE 3
MESSARA AVENUE TO PARK STREET
DUAL CARRIAGEWAY
DRAINAGE PROFILES SHEET 4 OF 7

PROFORMCIVIL ENGINEERING GROUP
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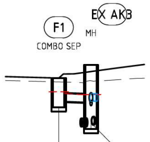
city of swan

DRAWING No: R771-117
REV No: 0

OPERATIONS

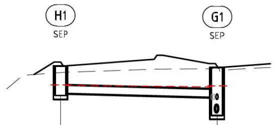


Diameter (mm) / Pipe Grade (%) / Design Flow (Q10 Cumecs) / Pipe Velocity (Q10 Flow): 300 dia, 1%, Q=0.03, 0.38m/s

DATUM RL 31.00

	F1		EX AK3	
HGL 10 YEAR	35.77	35.70	35.65 / 35.66	35.45
INVERT LEVEL		35.40	35.37	35.25
DEPTH TO INVERT	1.10	0.88	1.40 / 2.40	1.52
DESIGN SURFACE	36.28		36.77	
NATURAL SURFACE	36.14		36.18	
RUNNING CHAINAGE	0.00		3.03	

PROFILE DRAINAGE PIPE F

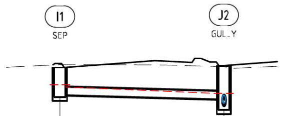


300 dia, 1%, Q=0.02, 0.22m/s

DATUM RL 31.00

	H1		G1	
HGL 10 YEAR	35.23	35.20	35.15 / 35.18	34.87
INVERT LEVEL		34.90	34.75	34.67
DEPTH TO INVERT	1.10	1.02	1.11 / 1.79	1.19
DESIGN SURFACE	35.92		35.87	
NATURAL SURFACE	35.68		35.84	
RUNNING CHAINAGE	0.00		14.65	

PROFILE DRAINAGE PIPE H

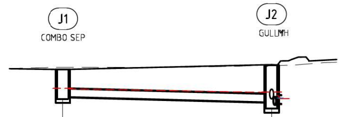


300 dia, 1%, Q=0.03, 0.4m/s

DATUM RL 30.00

	I1		J2	
HGL 10 YEAR	34.23	34.15	33.91 / 33.93	33.80
INVERT LEVEL		33.85	33.70	33.50
DEPTH TO INVERT	1.10	1.03	1.24 / 1.64	1.43
DESIGN SURFACE	34.88		34.94	
NATURAL SURFACE	34.99		34.92	
RUNNING CHAINAGE	0.00		15.37	

PROFILE DRAINAGE PIPE I

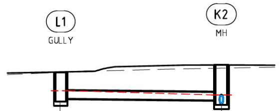


300 dia, 1%, Q=0.02, 0.21m/s

DATUM RL 29.00

	J1		J2	
HGL 10 YEAR	34.06	34.04	33.91 / 33.93	33.80
INVERT LEVEL		33.74	33.55	33.50
DEPTH TO INVERT	1.10	1.03	1.39 / 1.64	1.43
DESIGN SURFACE	34.77		34.94	
NATURAL SURFACE	34.85		34.92	
RUNNING CHAINAGE	0.00		19.55	

PROFILE DRAINAGE PIPE J

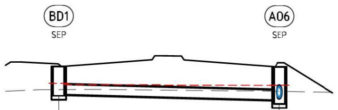


300 dia, 0.4%, Q=0.01, 0.1m/s

DATUM RL 29.00

	L1		K2	
HGL 10 YEAR		33.75	33.59	33.57
INVERT LEVEL		33.45	33.39	33.27
DEPTH TO INVERT	1.10	0.99	1.32 / 1.50	1.44
DESIGN SURFACE	34.44		34.71	
NATURAL SURFACE	34.44		34.59	
RUNNING CHAINAGE	0.00		15.10	

PROFILE DRAINAGE PIPE L

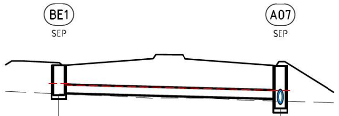


375 dia, 1%, Q=0.03, 0.28m/s

DATUM RL 28.00

	BD1		A06	
HGL 10 YEAR	32.18	32.14	32.11 / 32.11	32.09
INVERT LEVEL		31.76	31.56	31.64
DEPTH TO INVERT	1.10	1.05	1.25 / 1.40	1.17
DESIGN SURFACE	32.82		32.81	
NATURAL SURFACE	31.95		31.88	
RUNNING CHAINAGE	-6.93		13.72	

PROFILE DRAINAGE PIPE BD

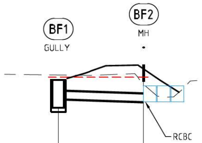


300 dia, 1%, Q=0.02, 0.34m/s

DATUM RL 27.00

	BE1		A07	
HGL 10 YEAR	31.96	31.90	31.70 / 31.71	31.67
INVERT LEVEL		31.60	31.39	31.22
DEPTH TO INVERT	1.10	1.02	1.23 / 1.60	1.40
DESIGN SURFACE	32.63		32.62	
NATURAL SURFACE	31.57		31.30	
RUNNING CHAINAGE	-6.93		13.82	

PROFILE DRAINAGE PIPE BE

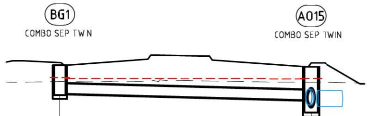


300 dia, 1.25%, Q=1.29, 18.21m/s

DATUM RL 26.00

	BF1		BF2	
HGL 10 YEAR		30.74		30.74
INVERT LEVEL		29.92	29.82	30.60
DEPTH TO INVERT	1.05	0.73	1.33	0.60
DESIGN SURFACE	30.65		31.20	
NATURAL SURFACE	30.83		30.49	
RUNNING CHAINAGE	0.00		8.00	

PROFILE DRAINAGE PIPE BF

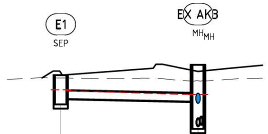


375 dia, 1%, Q=0.03, 0.25m/s

DATUM RL 26.00

	BG1		A015	
HGL 10 YEAR	30.79	30.76	30.76	30.74
INVERT LEVEL		30.20	29.96	29.73
DEPTH TO INVERT	1.10	1.06	1.23 / 1.70	1.47
DESIGN SURFACE	31.26		31.20	
NATURAL SURFACE	30.65		30.63	
RUNNING CHAINAGE	0.00		23.51	

PROFILE DRAINAGE PIPE BG

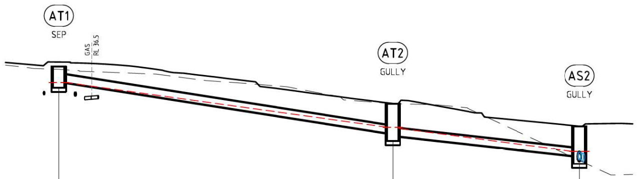


300 dia, 0.78%, Q=0.02, 0.28m/s

DATUM RL 31.00

	E1		EX AK3	
HGL 10 YEAR	35.84	35.80	35.65 / 35.66	35.45
INVERT LEVEL		35.50	35.40	35.25
DEPTH TO INVERT	1.10	0.89	1.37 / 2.40	1.52
DESIGN SURFACE	36.39		36.77	
NATURAL SURFACE	36.28		36.18	
RUNNING CHAINAGE	0.00		12.85	

PROFILE DRAINAGE PIPE E

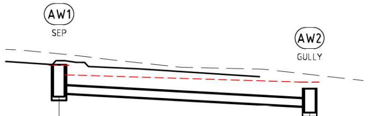


AT1–AT2: 300 dia, 6.08%, Q=0, 0m/s; AT2–AS2: 300 dia, 4.21%, Q=0.02, 0.28m/s

DATUM RL 31.00

	AT1		AT2		AS2	
HGL 10 YEAR		37.01	35.33	35.29	34.42 / 34.43	34.37
INVERT LEVEL		37.01	35.11	34.99	34.26	34.07
DEPTH TO INVERT	0.80	0.59	1.10 / 1.40	1.22	1.11 / 1.40	1.29
DESIGN SURFACE	37.60		36.21		35.36	
NATURAL SURFACE	37.50		36.21		34.09	
RUNNING CHAINAGE	-35.00		-3.74		13.73	

PROFILE DRAINAGE PIPE AT

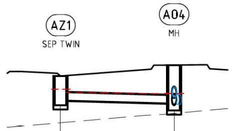


300 dia, 2.1%, Q=0.1, 1.49m/s

DATUM RL 24.00

	AW1		AW2	
HGL 10 YEAR	29.03	28.67		28.39
INVERT LEVEL		27.97	27.48	27.25
DEPTH TO INVERT	1.20	1.08	0.67	0.90
DESIGN SURFACE	29.05		28.15	
NATURAL SURFACE	29.46		28.68	
RUNNING CHAINAGE	0.00		23.48	

PROFILE DRAINAGE PIPE AW

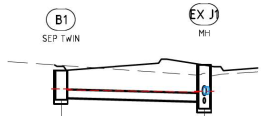


300 dia, 1%, Q=0.03, 0.48m/s

DATUM RL 28.00

	AZ1		A04	
HGL 10 YEAR	32.87	32.75	32.71	32.68
INVERT LEVEL		32.45	32.35	32.30
DEPTH TO INVERT	1.10	0.91	1.43 / 1.70	1.48
DESIGN SURFACE	33.37		33.78	
NATURAL SURFACE	31.62		31.97	
RUNNING CHAINAGE	0.00		10.63	

PROFILE DRAINAGE PIPE AZ



300 dia, 1%, Q=0.02, 0.27m/s

DATUM RL 31.00

	B1		EX J1	
HGL 10 YEAR	35.68	35.64	35.56 / 35.59	35.35
INVERT LEVEL		35.34	35.21	35.15
DEPTH TO INVERT	1.10	1.03	1.36 / 1.63	1.43
DESIGN SURFACE	36.37		36.57	
NATURAL SURFACE	36.56		36.27	
RUNNING CHAINAGE	0.00		13.41	

PROFILE DRAINAGE PIPE B

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REV	DATE	BY	DESCRIPTION
0	04.23	DW	ISSUED FOR CONSTRUCTION

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AUTHORISATION — PROJECT MANAGER, DATE; DESIGNED D.WEERTS; CHECKED; DATE

APPROVED — DESIGN CO-ORDINATOR, DATE; DRAWN C.CAYATTE

SCALE: (A1)
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HENLEY BROOK AVE - STAGE 3
MESSARA AVENUE TO PARK STREET
DUAL CARRIAGEWAY
DRAINAGE PROFILES SHEET 5 OF 7

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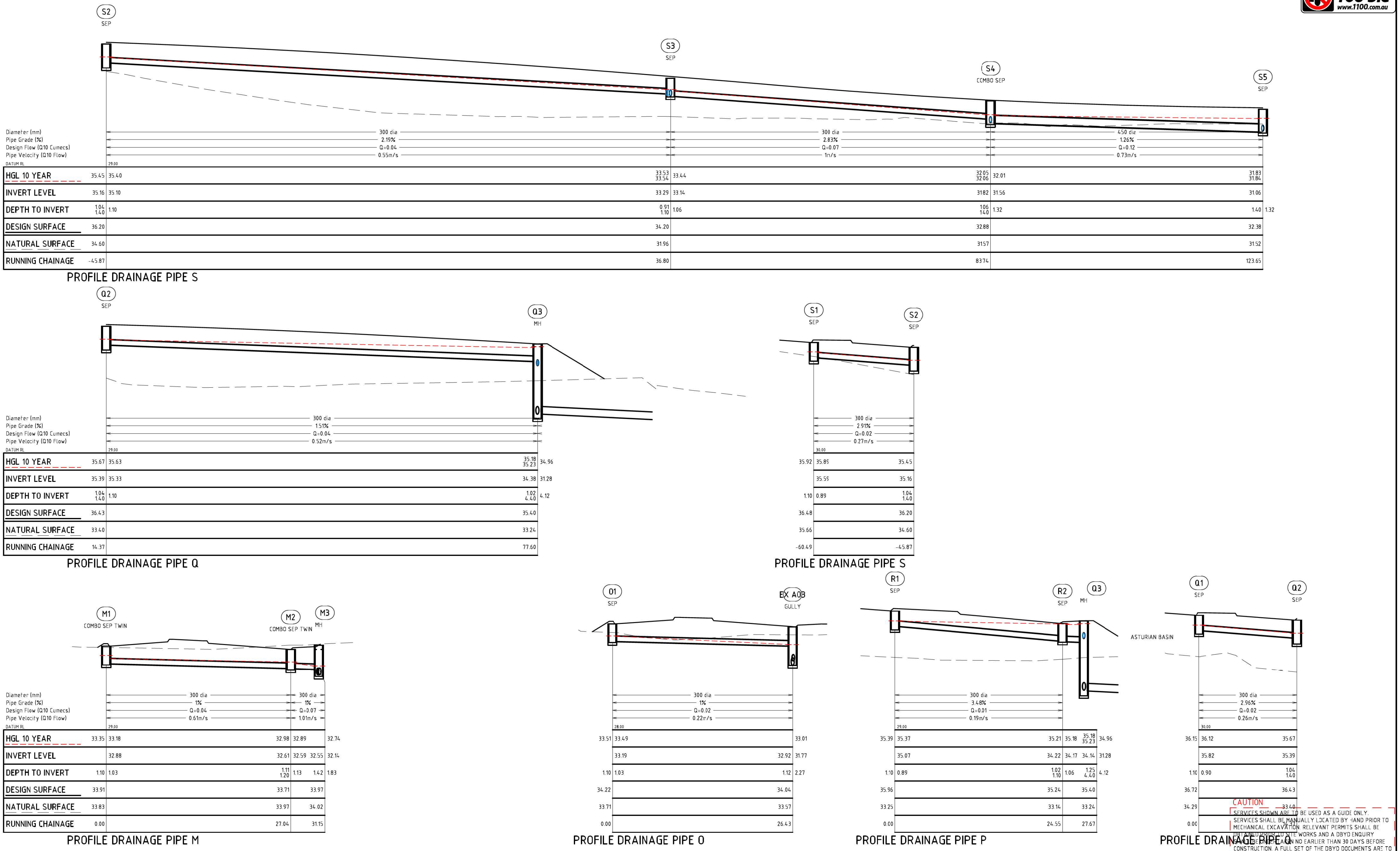
city of swan

DRAWING No: R771-118
REV No: 0

OPERATIONS



PROFILE DRAINAGE PIPE S

	S2	S3	S4	S5
Diameter (mm) / Pipe Grade (%) / Design Flow (Q10 Cumecs) / Pipe Velocity (Q10 Flow)	300 dia, 2.19%, Q=0.04, 0.55m/s	300 dia, 2.83%, Q=0.07, 1m/s	450 dia, 1.26%, Q=0.12, 0.73m/s	
DATUM RL	29.00			
HGL 10 YEAR	35.45 35.40	33.53 33.54 33.44	32.05 32.06 32.01	31.83 31.84
INVERT LEVEL	35.16 35.10	33.29 33.14	31.82 31.56	31.06
DEPTH TO INVERT	1.04 1.40 1.10	0.91 1.10 1.06	1.06 1.40 1.32	1.40 1.32
DESIGN SURFACE	36.20	34.20	32.88	32.38
NATURAL SURFACE	34.60	31.96	31.57	31.52
RUNNING CHAINAGE	-45.87	36.80	83.74	123.65

PROFILE DRAINAGE PIPE Q

	Q2	Q3
Diameter (mm) / Pipe Grade (%) / Design Flow (Q10 Cumecs) / Pipe Velocity (Q10 Flow)	300 dia, 1.51%, Q=0.04, 0.52m/s	
DATUM RL	29.00	
HGL 10 YEAR	35.67 35.63	35.18 35.23 34.96
INVERT LEVEL	35.39 35.33	34.38 31.28
DEPTH TO INVERT	1.04 1.40 1.10	1.02 4.40 4.12
DESIGN SURFACE	36.43	35.40
NATURAL SURFACE	33.40	33.24
RUNNING CHAINAGE	14.37	77.60

PROFILE DRAINAGE PIPE S

	S1	S2
Diameter (mm) / Pipe Grade (%) / Design Flow (Q10 Cumecs) / Pipe Velocity (Q10 Flow)	300 dia, 2.91%, Q=0.02, 0.27m/s	
DATUM RL	30.00	
HGL 10 YEAR	35.92 35.85	35.45
INVERT LEVEL	35.55	35.16
DEPTH TO INVERT	1.10 0.89	1.04 1.40
DESIGN SURFACE	36.48	36.20
NATURAL SURFACE	35.66	34.60
RUNNING CHAINAGE	-60.49	-45.87

PROFILE DRAINAGE PIPE M

	M1	M2	M3
Diameter (mm) / Pipe Grade (%) / Design Flow (Q10 Cumecs) / Pipe Velocity (Q10 Flow)	300 dia, 1%, Q=0.04, 0.61m/s	300 dia, 1%, Q=0.07, 1.01m/s	
DATUM RL	29.00		
HGL 10 YEAR	33.35 33.18	32.98 32.89	32.74
INVERT LEVEL	32.88	32.61 32.59	32.55 32.14
DEPTH TO INVERT	1.10 1.03	1.11 1.20 1.13	1.42 1.83
DESIGN SURFACE	33.91	33.71	33.97
NATURAL SURFACE	33.83	33.97	34.02
RUNNING CHAINAGE	0.00	27.04	31.15

PROFILE DRAINAGE PIPE O

	O1	EX AOB
Diameter (mm) / Pipe Grade (%) / Design Flow (Q10 Cumecs) / Pipe Velocity (Q10 Flow)	300 dia, 1%, Q=0.02, 0.22m/s	
DATUM RL	28.00	
HGL 10 YEAR	33.51 33.49	33.01
INVERT LEVEL	33.19	32.92 31.77
DEPTH TO INVERT	1.10 1.03	1.12 2.27
DESIGN SURFACE	34.22	34.04
NATURAL SURFACE	33.71	33.57
RUNNING CHAINAGE	0.00	26.43

PROFILE DRAINAGE PIPE P

	R1	R2	Q3
Diameter (mm) / Pipe Grade (%) / Design Flow (Q10 Cumecs) / Pipe Velocity (Q10 Flow)	300 dia, 3.48%, Q=0.01, 0.19m/s		
DATUM RL	29.00		
HGL 10 YEAR	35.39 35.37	35.21 35.18	35.18 35.23 34.96
INVERT LEVEL	35.07	34.22 34.17	34.14 31.28
DEPTH TO INVERT	1.10 0.89	1.02 1.10 1.06	1.25 4.40 4.12
DESIGN SURFACE	35.96	35.24	35.40
NATURAL SURFACE	33.25	33.14	33.24
RUNNING CHAINAGE	0.00	24.55	27.67

PROFILE DRAINAGE PIPE Q

	Q1	Q2
Diameter (mm) / Pipe Grade (%) / Design Flow (Q10 Cumecs) / Pipe Velocity (Q10 Flow)	300 dia, 2.96%, Q=0.02, 0.26m/s	
DATUM RL	30.00	
HGL 10 YEAR	36.15 36.12	35.67
INVERT LEVEL	35.82	35.39
DEPTH TO INVERT	1.10 0.90	1.04 1.40
DESIGN SURFACE	36.72	36.43
NATURAL SURFACE	34.29	33.40
RUNNING CHAINAGE	0.00	[illegible]

CAUTION
SERVICES SHOWN ARE TO BE USED AS A GUIDE ONLY. SERVICES SHALL BE MANUALLY LOCATED BY HAND PRIOR TO MECHANICAL EXCAVATION. RELEVANT PERMITS SHALL BE OBTAINED PRIOR TO SITE WORKS AND A DBYD ENQUIRY UNDERTAKEN NO EARLIER THAN 30 DAYS BEFORE CONSTRUCTION. A FULL SET OF THE DBYD DOCUMENTS ARE TO BE KEPT ON SITE AT ALL TIMES. CONFLICTING SERVICES ARE TO BE RELOCATED/PROTECTED TO THE SATISFACTION OF THE SERVICE AUTHORITY PRIOR TO WORKS.

REV	DATE	BY	DESCRIPTION
0	04.23	DW	ISSUED FOR CONSTRUCTION

AMENDMENTS

AUTHORISATION — PROJECT MANAGER — DATE
APPROVED — DESIGN CO-ORDINATOR — DATE
DESIGNED D.WEERTS — CHECKED — DATE — DRAWN C.CAYATTE

SCALE: (A1)
DATUM: A.H.D.

HENLEY BROOK AVE - STAGE 3
MESSARA AVENUE TO PARK STREET
DUAL CARRIAGEWAY
DRAINAGE PROFILES SHEET 6 OF 7

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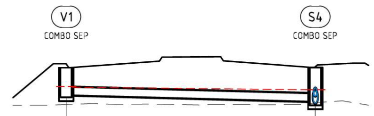
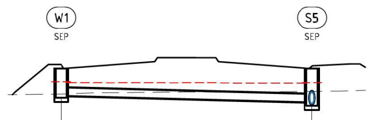
city of swan

DRAWING No: R771-119
REV No: 0
OPERATIONS



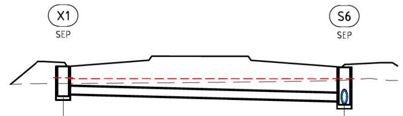
	V1		S4	
Diameter (mm)	300 dia			
Pipe Grade (%)	1%			
Design Flow (Q10 Cumecs)	Q=0.02			
Pipe Velocity (Q10 Flow)	0.22m/s			
DATUM RL	28.00			
HGL 10 YEAR	32.18	32.15	32.05 32.06	32.01
INVERT LEVEL		31.85	31.62	31.56
DEPTH TO INVERT	1.10	1.02	1.26 1.40	1.32
DESIGN SURFACE	32.87		32.88	
NATURAL SURFACE	31.50		31.57	
RUNNING CHAINAGE	0.00		23.35	

PROFILE DRAINAGE PIPE V



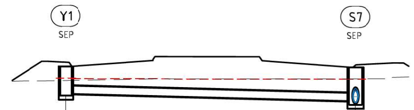
	W1		S5	
Diameter (mm)	300 dia			
Pipe Grade (%)	1%			
Design Flow (Q10 Cumecs)	Q=0.02			
Pipe Velocity (Q10 Flow)	0.27m/s			
DATUM RL	27.00			
HGL 10 YEAR	31.88	31.84	31.83 31.84	31.77
INVERT LEVEL		31.36	31.12	31.06
DEPTH TO INVERT	1.10	1.02	1.26 1.40	1.32
DESIGN SURFACE	32.38		32.38	
NATURAL SURFACE	31.42		31.52	
RUNNING CHAINAGE	0.00		23.50	

PROFILE DRAINAGE PIPE W



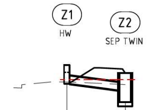
	X1		S6	
Diameter (mm)	300 dia			
Pipe Grade (%)	1%			
Design Flow (Q10 Cumecs)	Q=0.02			
Pipe Velocity (Q10 Flow)	0.32m/s			
DATUM RL	27.00			
HGL 10 YEAR	31.70	31.66	31.65 31.66	31.56
INVERT LEVEL		31.08	30.82	30.76
DEPTH TO INVERT	1.10	1.03	1.27 1.40	1.33
DESIGN SURFACE	32.11		32.08	
NATURAL SURFACE	31.47		31.60	
RUNNING CHAINAGE	0.00		26.36	

PROFILE DRAINAGE PIPE X



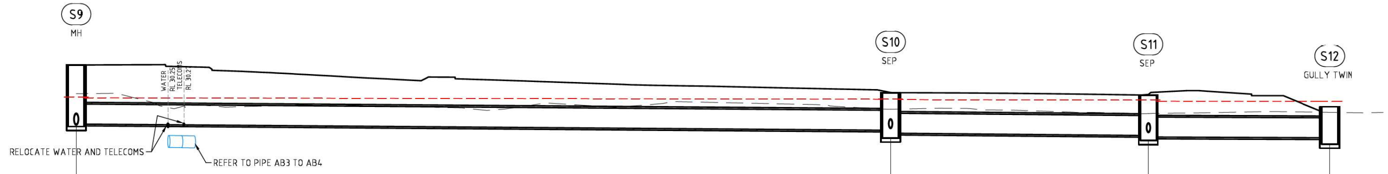
	Y1		S7	
Diameter (mm)	300 dia			
Pipe Grade (%)	1%			
Design Flow (Q10 Cumecs)	Q=0.02			
Pipe Velocity (Q10 Flow)	0.26m/s			
DATUM RL	27.30			
HGL 10 YEAR	31.46	31.44	31.43 31.43	31.38
INVERT LEVEL		30.87	30.60	30.54
DEPTH TO INVERT	1.10	1.03	1.26 1.40	1.32
DESIGN SURFACE	31.90		31.86	
NATURAL SURFACE	31.37		31.44	
RUNNING CHAINAGE	0.00		27.12	

PROFILE DRAINAGE PIPE Y



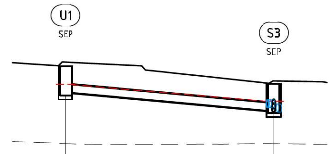
	Z1		Z2
Diameter (mm)		300 dia	
Pipe Grade (%)		4.57%	
Design Flow (Q10 Cumecs)		Q=0	
Pipe Velocity (Q10 Flow)		0m/s	
DATUM RL		27.00	
HGL 10 YEAR		31.40	31.40
INVERT LEVEL		31.25	31.00
DEPTH TO INVERT		0.70	0.66 1.10
DESIGN SURFACE	31.95		31.66
NATURAL SURFACE	31.32		31.22
RUNNING CHAINAGE	-6.93		-1.46

PROFILE DRAINAGE PIPE Z



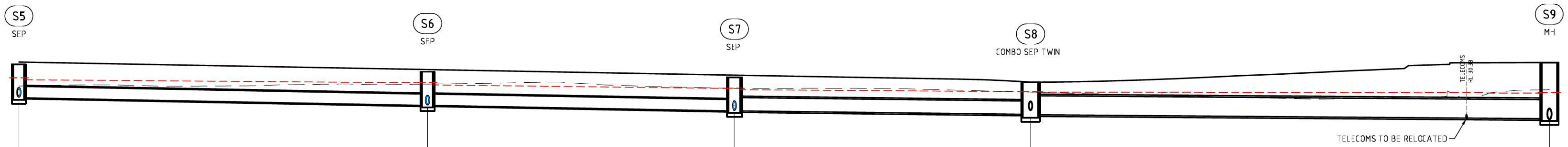
	S9		S10		S11		S12	
Diameter (mm)	750 dia		750 dia		750 dia			
Pipe Grade (%)	0.3%		0.34%		0.15%			
Design Flow (Q10 Cumecs)	Q=0.29		Q=0.28		Q=0.28			
Pipe Velocity (Q10 Flow)	0.67m/s		0.64m/s		0.63m/s			
DATUM RL	26.00							
HGL 10 YEAR	31.25 31.26	31.22	31.17	31.15	31.14 31.15	31.10		31.09
INVERT LEVEL	30.24	30.24	30.01	29.89	29.81	29.75	29.72	29.43
DEPTH TO INVERT	2.30	2.21	1.41 1.70	1.52	1.51 1.70	1.57	1.16	1.40
DESIGN SURFACE	32.45		31.41		31.32		30.89	
NATURAL SURFACE	31.37		30.79		30.63		30.68	
RUNNING CHAINAGE	273.39		349.64		373.78		390.76	

PROFILE DRAINAGE PIPE S



	U1		S3	
Diameter (mm)	300 dia			
Pipe Grade (%)	3.48%			
Design Flow (Q10 Cumecs)	Q=0.01			
Pipe Velocity (Q10 Flow)	0.18m/s			
DATUM RL	29.00			
HGL 10 YEAR	34.18	34.16	33.53 33.54	33.44
INVERT LEVEL		33.86	33.18	33.14
DEPTH TO INVERT	1.10	0.99	1.02 1.10	1.06
DESIGN SURFACE	34.85		34.20	
NATURAL SURFACE	31.96		31.96	
RUNNING CHAINAGE	0.00		19.50	

PROFILE DRAINAGE PIPE U



	S5		S6		S7		S8		S9	
Diameter (mm)	450 dia		450 dia		525 dia		750 dia			
Pipe Grade (%)	0.75%		0.71%		0.46%		0.3%			
Design Flow (Q10 Cumecs)	Q=0.16		Q=0.19		Q=0.22		Q=0.27			
Pipe Velocity (Q10 Flow)	0.98m/s		1.21m/s		1.02m/s		0.61m/s			
DATUM RL	26.00									
HGL 10 YEAR	31.83 31.84	31.77	31.65 31.66	31.56	31.43 31.43	31.38	31.30	31.28	31.25 31.26	
INVERT LEVEL	31.06	31.06	30.76	30.76	30.54	30.54	30.41	30.39	30.24	
DEPTH TO INVERT	1.40	1.32	1.40	1.33	1.40	1.32	1.26 1.40	1.28	2.30	2.21
DESIGN SURFACE	32.38		32.08		31.86		31.67		32.45	
NATURAL SURFACE	31.52		31.60		31.44		31.28		31.37	
RUNNING CHAINAGE	123.65		163.65		193.65		222.64		273.39	

PROFILE DRAINAGE PIPE S

CAUTION

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AMENDMENTS

REV	DATE	BY	DESCRIPTION
0	04.23	DW	ISSUED FOR CONSTRUCTION

AUTHORISATION		APPROVED	
PROJECT MANAGER	DATE	DESIGN CO-ORDINATOR	DATE
DESIGNED D.WEERTS	CHECKED	DATE	DRAWN C.CAYATTE

SCALE: (A1)
DATUM: A.H.D.

HENLEY BROOK AVE - STAGE 3

MESSARA AVENUE TO PARK STREET
DUAL CARRIAGEWAY
DRAINAGE PROFILES SHEET 7 OF 7

PROFORMCIVIL ENGINEERING GROUP
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city of swan

DRAWING No: R771-120
REV No: 0

OPERATIONS

PIT SCHEDULE

NAME	TYPE	EASTING	NORTHING	SETOUT RL	DIAMETER	DEPTH	REMARKS
A1	SEP	65368.86	280499.416	36.156	1.05	1.75	CONVERT SEP
AB1	HW	65486.156	279492.43	30.616	0.5	1.02	
AB2	GULLY	65492.203	279489.748	31.665	1.05	1.4	
AB3	MH	65514.087	279474.464	32.374	1.05	3.2	
AB4	MH	65517.332	279468.574	32.387	1.05	3.2	
AB5	GULLY	65544.371	279418.431	31.535	1.05	1.1	
AD1	GULLY	65571.331	279487.817	31.777	1.05	0.91	
AD2	GULLY	65570.945	279473.871	31.836	1.05	1.4	
AF1	SEP	65537.14	279398.803	31.353	1.05	1.1	
AG1	SEP	65535.727	279378.529	31.238	1.05	1.1	
AH1	HW	65472.953	279356.434	29.88	0.1	1	
AH2	HW	65538.748	279361.724	29.68	0.1	1	
AI1	SEP	65502.901	279200.582	31.853	1.05	1.4	
AJ1	SEP	65512.361	279319.993	31.305	1.05	1.1	
AK1	SEP	65508.831	279280.224	31.468	1.05	1.4	
AL1	SEP	65506.051	279240.309	31.661	1.05	1.4	
AM1	HW	65493.629	279181.576	30.368	0.5	0.77	
AM2	HW	65525.346	279166.526	30.173	0.5	0.77	
AN1	SEP	65500.487	279160.431	32.047	1.05	1.4	
AO1	GULLY	65467.156	278839.28	35.834	1.05	0.81	
AO10	SEP	65520.44	279159.061	32.042	1.2	2.9	
AO11	SEP	65523.22	279198.964	31.85	1.2	2.9	
AO12	SEP	65525.999	279238.867	31.658	1.2	1.7	
AO13	SEP	65529.22	279278.74	31.465	1.2	1.5	
AO14	SEP	65531.558	279318.674	31.274	1.2	1.5	
AO15	COMBO SEP TWIN	65533.973	279353.344	31.198	1.2	1.7	
AO16	HW	65539.103	279355.932	29.705	0.5	1.49	
AO2	SEP	65482.526	278859.155	36.031	1.05	1.4	
AO3	SEP	65495.393	278874.71	35.869	1.05	1.4	
AO4	MH	65496.554	278950.969	33.778	1.05	1.7	
AO5	SEP TWIN	65507.659	278964.223	33.164	1.05	1.4	
AO6	SEP	65509.374	279000.196	32.808	1.05	1.4	
AO7	SEP	65512.511	279039.322	32.619	1.05	1.6	
AO8	GULLY	65514.417	279072.594	32.459	1.2	1.7	
AO9	SEP	65517.661	279119.157	32.235	1.2	1.7	
AP1	SEP	65497.699	279120.401	32.241	1.05	1.1	
AQ1	SEP	65494.469	279074.033	32.465	1.05	1.1	
AR1	GULLY	65497.64	278862.009	36.365	1.05	1.1	
AS1	GULLY	65468.096	278821.876	35.573	1.05	1.1	
AS2	GULLY	65502.028	278789.94	35.361	1.05	1.4	
AS3	SEP	65515.674	278742.792	33.441	1.05	1.2	
AS4	SEP	65541.558	278694.494	31.438	1.05	1.2	
AS5	MH	65555.895	278689.43	31.296	1.05	1.4	
AS6	SEP	65579.517	278646.888	29.812	1.05	1.1	
AS7	GULLY TWIN	65602.366	278644.397	28.76	1.05	1.1	
AT1	SEP	65534.277	278827.304	37.604	1.05	0.8	
AT2	GULLY	65514.312	278802.333	36.211	1.05	1.4	
AW1	SEP	65615.778	278597.47	29.053	1.05	1.2	
AW2	GULLY	65639.587	278596.699	28.15	1.05	0.9	
AZ1	SEP TWIN	65485.949	278951.692	33.368	1.05	1.1	
B1	SEP TWIN	65381.444	280449.664	36.373	1.05	1.1	
BB1	COMBO SEP	65408.878	280240.858	35.427	1.05	1.1	ADJUST LID
BC1	SEP	65422.383	280246.134	35.434	1.05	1.46	CONVERT LID TO SEP
BD1	SEP	65489.423	279001.586	32.816	1.05	1.1	
BE1	SEP	65492.154	279040.805	32.626	1.05	1.1	
BF1	GULLY	65490.552	279367.734	30.65	1.05	1.05	
BG1	COMBO SEP TWIN	65511.878	279347.43	31.256	1.05	1.1	
C1	SEP TWIN	65367.048	280442.526	36.397	1.05	1.1	
D1	GULLY	65347.561	280369.402	37.078	1.05	1.1	

NAME	TYPE	EASTING	NORTHING	SETOUT RL	DIAMETER	DEPTH	REMARKS
D2	MH	65353.572	280366.232	37.081	1.05	2.19	ADJUST LID
E1	SEP	65393.199	280341.258	36.388	1.05	1.1	
Ex A01	MH	65438.188	280137.283	34.527	1.05	1.57	Convert to MH Raise Lid
Ex Ak3	MH	65380.845	280338.337	36.768	1.05	2.4	adjust lid
Ex A03	GULLY	65473.827	280042.043	34.04	1.05	2.27	CONVERT MH TO GULLY
Ex J1	MH	65368.753	280447.074	36.773	1.05	1.63	CONVERT TO MH AND RAISE LID
F1	COMBO SEP	65379.584	280335.578	36.277	1.05	1.1	
G1	SEP	65391.734	280289.009	35.865	1.05	1.79	ADJUST LID
H1	SEP	65405.513	280293.536	35.923	1.05	1.1	
I1	SEP	65443.397	280192.46	34.88	1.05	1.1	
J1	COMBO SEP	65436.923	280169.222	34.768	1.05	1.1	
J2	GULLY	65429.797	280187.425	34.936	1.05	1.64	ADJUST LID
K1	SEP	65461.387	280146.51	34.406	1.05	1.1	
K2	MH	65449.142	280141.652	34.712	1.05	1.5	
K3	COMBO SEP	65440.007	280138.03	34.394	1.05	1.4	
L1	GULLY	65455.385	280128.003	34.44	1.05	1.1	
M1	COMBO SEP TWIN	65484.273	280088.052	33.906	1.05	1.1	
M2	COMBO SEP TWIN	65458.917	280080.128	33.714	1.05	1.2	
M3	MH	65454.961	280079.02	33.714	1.05	1.83	
N1	HW	65521.811	279075.98	31.005	0.5	0.85	
N2	HW outlet	65522.523	279088.075	30.935	0.5	0.85	
O1	SEP	65498.65	280051.329	34.215	1.05	1.1	
Q1	SEP	65530.456	279942.856	36.717	1.05	1.1	
Q2	SEP	65516.349	279938.444	36.434	1.05	1.4	
Q3	MH	65491.73	279996.688	35.235	1.05	4.4	Raise MH
R1	SEP	65515.669	279984.542	35.964	1.05	1.1	
R2	SEP	65494.914	279997.782	35.238	1.05	1.1	
S1	SEP	65554.075	279799.171	36.479	1.05	1.1	
S10	SEP	65514.471	279404.233	31.413	1.5	1.7	
S11	SEP	65510.63	279380.403	31.322	1.5	1.7	
S12	GULLY TWIN	65493.616	279381.346	31.369	1.5	1.4	
S2	SEP	65539.117	279798.784	36.203	1.05	1.4	
S3	SEP	65536.189	279716.156	34.201	1.05	1.1	
S4	COMBO SEP	65532.83	279669.341	32.876	1.05	1.4	
S5	SEP	65530.155	279629.523	32.378	1.05	1.4	
S6	SEP	65527.375	279589.62	32.083	1.05	1.4	
S7	SEP	65525.041	279559.709	31.861	1.2	1.4	
S8	COMBO SEP TWIN	65523.014	279530.786	31.669	1.5	1.4	
S9	MH	65516.49	279480.453	32.448	1.5	2.3	
U1	SEP	65551.573	279728.336	34.855	1.05	1.1	
V1	COMBO SEP	65555.879	279667.828	32.873	1.05	1.1	
W1	SEP	65553.101	279627.923	32.378	1.05	1.1	
X1	SEP	65553.039	279587.829	32.106	1.05	1.1	
Y1	SEP	65551.566	279557.928	31.904	1.05	1.1	
Z1	HW	65552.062	279528.036	31.25	0.5	0.7	
Z2	SEP TWIN	65546.599	279528.119	31.656	1.05	1.1	

PIPE SCHEDULE

NAME	DIAMETER	LENGTH	U/S IL	D/S L	SLOPE(1in)	SLOPE(%)	CLASS
BF1 to BF2	300	8	29.924	29.824	-80	1.25	HDPE SN8
AD1 to AD2	300	12.97	30.768	30.638	-100	1	RCP 4
AF1 to S10	300	23.33	30.337	30.104	-100	1	RCP 4
AG1 to S11	300	25.71	30.209	29.952	-100	1	RCP 4
AJ1 to AI5	300	20.08	30.277	30.077	-100	1	RCP 4
AR1 to AO3	300	12.88	35.312	34.873	-29.3	3.41	RCP 4
AS1 to AS2	300	46.53	34.567	34.102	-100	1	RCP 4
AS2 to AS3	300	49.13	34.067	32.422	-29.9	3.35	RCP 4
AS3 to AS4	300	54.8	32.355	30.375	-27.7	3.61	RCP 4
AS4 to AS5	300	15.21	30.314	30.162	-100	1	RCP 4
AS5 to AS6	300	48.62	30.122	28.857	-38.4	2.6	RCP 4
AS6 to AS7	300	22.51	28.812	28.121	-32.6	3.07	RCP 4
AT1 to AT2	300	31.26	37.01	35.109	-16.4	6.08	RCP 4
AT2 to AS1	300	17.47	34.991	34.256	-23.8	4.21	RCP 4
AW1 to AW2	300	23.48	27.97	27.478	-47.7	2.1	RCP 4
AZ1 to AO4	300	10.63	32.453	32.347	-100	1	RCP 4
B1 to C2	300	13.41	35.345	35.211	-100	1	RCP 4
BE1 to AO7	300	20.75	31.601	31.394	-100	1	RCP 4
C1 to Ex J1	300	4.71	35.512	35.465	-100	1	RCP 4
D1 to D2	300	6.91	36.042	35.973	-100	1	RCP 4
E1 to E2	300	12.85	35.5	35.4	-128.5	0.78	RCP 4
F1 to E2	300	3.03	35.4	35.37	-100	1	RCP 4
H1 to G1	300	14.65	34.901	34.755	-100	1	RCP 4
I1 to J2	300	15.37	33.854	33.7	-100	1	RCP 4
J1 to J2	300	19.55	33.742	33.547	-100	1	RCP 4
K1 to K2	300	13.55	33.409	33.274	-100	1	RCP 4
K2 to K3	300	9.83	33.274	33.176	-100	1	RCP 4
K3 to Ex A01	300	1.97	33.176	33.156	-100	1	RCP 4
L1 to K2	300	15.1	33.453	33.393	-250.2	0.4	RCP 4
M1 to M2	300	27.04	32.877	32.606	-100	1	RCP 4
M2 to M3	300	4.11	32.586	32.545	-100	1	RCP 4
O1 to Ex AO3	300	26.43	33.189	32.925	-100	1	RCP 4
Q1 to Q2	300	14.37	35.82	35.355	-33.8	2.96	RCP 4
Q2 to Ex AO4	300	63.23	35.335	34.378	-66.1	1.51	RCP 4
R1 to R2	300	24.55	35.074	34.22	-28.7	3.48	RCP 4
R2 to Q3	300	3.12	34.175	34.143	-100	1	RCP 4
S1 to S2	300	14.62	35.588	35.163	-34.4	2.91	RCP 4
S2 to S3	300	82.67	35.103	33.289	-45.6	2.19	RCP 4
S3 to S4	300	46.94	33.144	31.815	-35.3	2.83	RCP 4
U1 to S3	300	19.5	33.863	33.184	-28.7	3.48	RCP 4
V1 to S4	300	23.35	31.851	31.617	-100	1	RCP 4
W1 to S5	300	23.5	31.356	31.121	-100	1	RCP 4
X1 to S6	300	26.36	31.08	30.816	-100	1	RCP 4
Y1 to S7	300	27.12	30.873	30.602	-100	1	RCP 4
Z1 to Z2	300	5.47	31.25	31	-21.9	4.57	RCP 4
Z2 to S8	300	23.75	30.714	30.555	-200	0.5	RCP 4
AO2 to S9	375	54.63	30.573	30.236	-162.3	0.62	RCP 4
AI1 to AI2	375	20.79	30.748	30.54	-100	1	RCP 4
AK1 to AI4	375	20.77	30.364	30.156	-100	1	RCP 4
AL1 to AI3	375	20.72	30.558	30.351	-100	1	RCP 4
AN1 to AO10	375	20.82	30.941	30.733	-100	1	RCP 4
AO1 to AO2	375	25.34	35.115	34.857	-98.3	1.02	RCP 4
AO2 to AO3	375	20.29	34.807	34.604	-100	1	RCP 4
AO3 to AO4	375	76.27	34.569	32.573	-38.2	2.62	RCP 4
AO4 to AO5	375	17.61	32.302	32.126	-100	1	RCP 4
AO5 to AO6	375	35.97	32.035	31.675	-100	1	RCP 4
AP1 to AO9	375	20.82	31.186	30.928	-80.6	1.24	RCP 4
AQ1 to AO8	375	20.85	31.408	31.15	-80.7	1.24	RCP 4
BD1 to AO6	375	20.65	31.765	31.558	-100	1	RCP 4
BG1 to AI6	375	23.51	30.2	29.965	-100	1	RCP 4
N1 to N2	450	12.12	31.005	30.935	-173.8	0.58	HDPE SN8
AB1 to AB2	450	6.67	30.616	30.489	-52.6	1.9	RCP 4
AB2 to AB3	450	26.62	30.489	30.278	-126.1	0.79	RCP 4

NAME	DIAMETER	LENGTH	U/S IL	D/S IL	SLOPE(1in)	SLOPE(%)	CLASS
AB3 to AB4	450	6.72	29.378	29.344	-197.4	0.51	RCP 4
AB4 to AB5	450	56.97	30.278	29.708	-100	1	RCP 4
AO6 to AC7	450	39.25	31.635	31.243	-100	1	RCP 4
AO7 to AC8	450	33.32	31.223	30.889	-100	1	RCP 4
S4 to S5	450	35.91	31.557	31.056	-79.7	1.26	RCP 4
S5 to S6	450	40	31.056	30.756	-133.2	0.75	RCP 4
S6 to S7	450	30	30.756	30.542	-139.9	0.71	RCP 4
AO10 to AO11	525	40	29.418	29.258	-250	0.4	RCP 4
AO11 to AO12	525	40	30.475	30.315	-250	0.4	RCP 4
AO8 to AO9	525	46.68	30.869	30.683	-250	0.4	RCP 4
AO9 to AO10	525	40	30.663	30.503	-250	0.4	RCP 4
S7 to S8	525	28.99	30.542	30.409	-217.8	0.46	RCP 4
AO12 to AO13	600	40	30.286	30.126	-250	0.4	RCP 4
AO13 to AO14	600	40	30.091	29.931	-250	0.4	RCP 4
AO14 to AO15	600	34.75	29.911	29.772	-250	0.4	RCP 4
AO15 to AO16	600	5.53	29.727	29.705	-250	0.4	RCP 4
S10 to S11	750	24.15	29.893	29.81	-291.7	0.34	RCP 4
S11 to S12	750	16.97	29.75	29.725	-666.6	0.15	RCP 4
S8 to S9	750	50.75	30.389	30.236	-333.3	0.3	RCP 4
S9 to S10	750	76.24	30.236	30.008	-333.3	0.3	RCP 4
AM1 to AM2	(2x)375	35.11	30.369	30.174	-179.7	0.56	RCP 4
AH1 to AH2	(3x)600	66.01	29.88	29.68	-330	0.3	RCB

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AMENDMENTS

REV.	DATE	BY	DESCRIPTION
0	04.23	DW	ISSUED FOR CONSTRUCTION

AUTHORISATION

PROJECT MANAGER — DATE

APPROVED

DESIGN CO-ORDINATOR — DATE

DESIGNED D.WEERTS — CHECKED — DATE — DRAWN C.CAYATTE

SCALE: (A1)

DATUM: A.H.D.

HENLEY BROOK AVE - STAGE 3

MESSARA AVENUE TO PARK STREET

DUAL CARRIAGEWAY

DRAINAGE SCHEDULES

PROFORMCIVIL ENGINEERING GROUP
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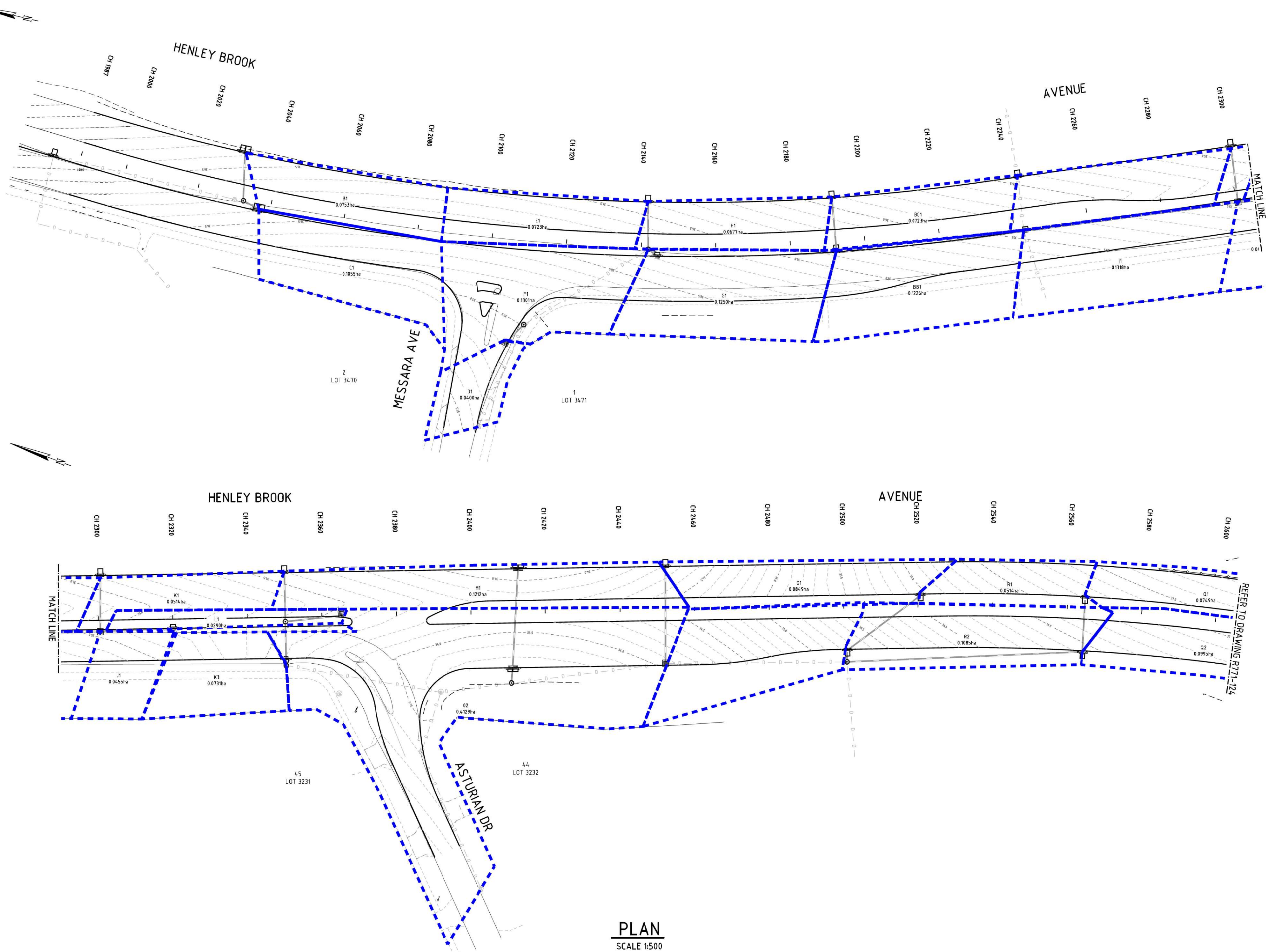
city of swan

DRAWING No: R771-121

REV No: 0

OPERATIONS



PLAN
SCALE 1:500

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REV.	DATE	BY	DESCRIPTION
0	04.23	DW	ISSUED FOR CONSTRUCTION

AMENDMENTS

AUTHORISATION: PROJECT MANAGER / DATE; DESIGNED D.WEERTS; CHECKED; DATE
APPROVED: DESIGN CO-ORDINATOR / DATE; DRAWN C.CAYATTE

SCALE: 1:500 (A1)
DATUM: A.H.D.

HENLEY BROOK AVE - STAGE 3
MESSARA AVENUE TO PARK STREET
DUAL CARRIAGEWAY
DRAINAGE CATCHMENT PLAN SHEET 1 OF 4

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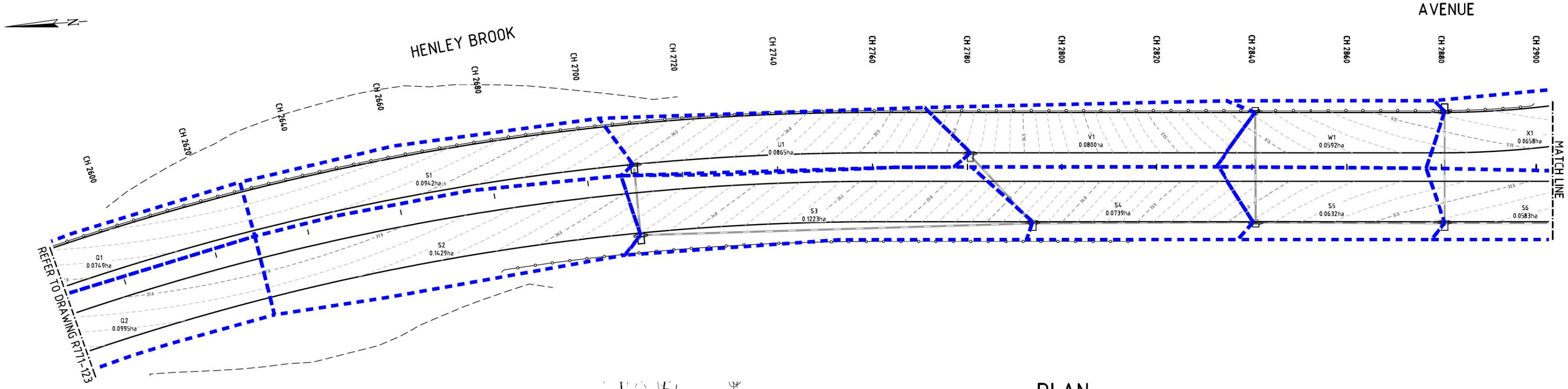
DRAWING No: R771-122
REV No: 0

OPERATIONS



PLAN
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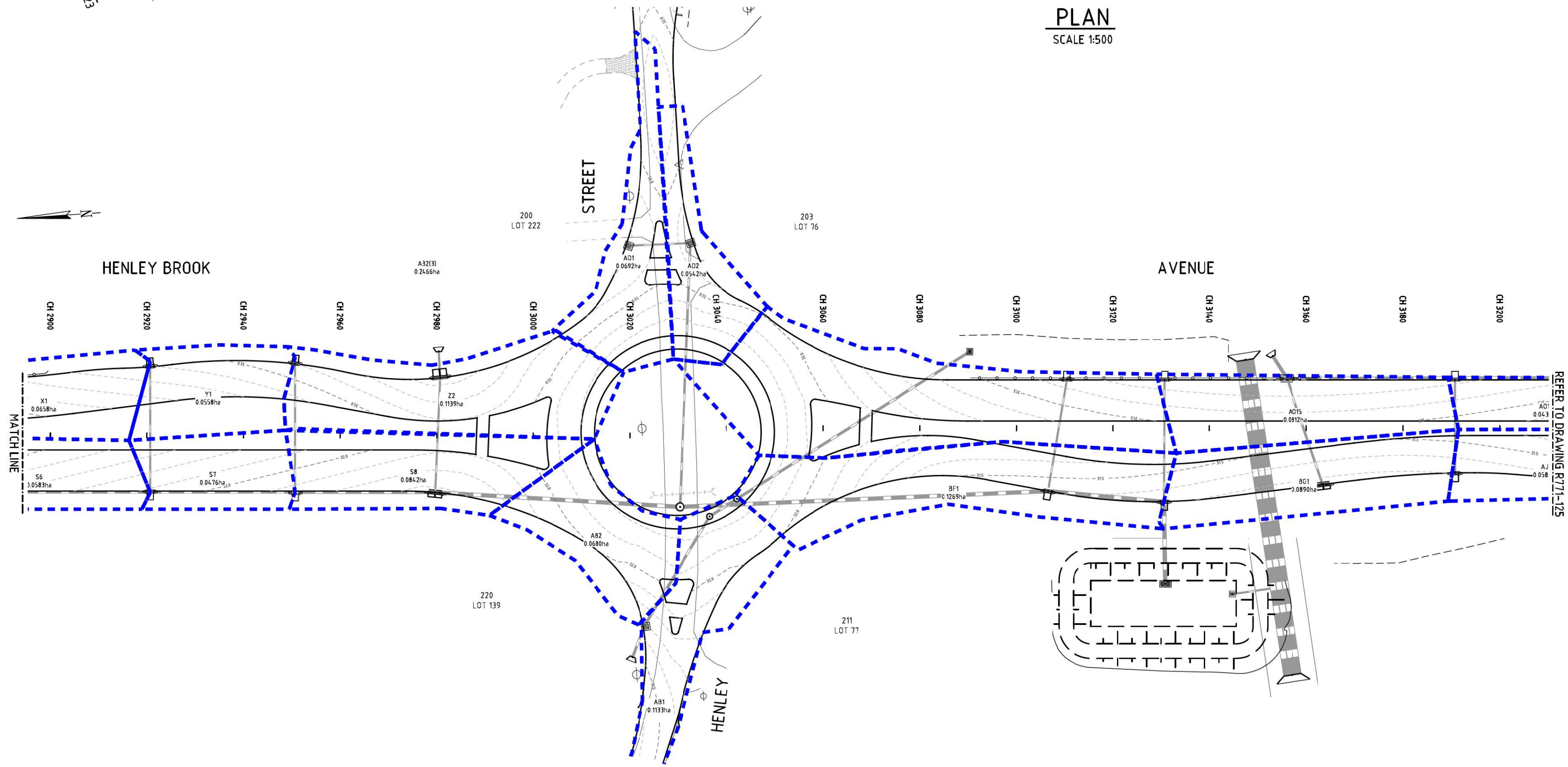

PLAN
SCALE 1:500

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REV	DATE	BY	DESCRIPTION
0	04.23	DW	ISSUED FOR CONSTRUCTION

AMENDMENTS

AUTHORISATION		APPROVED	
PROJECT MANAGER	DATE	DESIGN CO-ORDINATOR	DATE
DESIGNED D.WEERTS	CHECKED	DATE	DRAWN C.CAYATTE

SCALE: 1:500 (A1)
DATUM: A.H.D.

HENLEY BROOK AVE - STAGE 3

MESSARA AVENUE TO PARK STREET

DUAL CARRIAGEWAY

DRAINAGE CATCHMENT PLAN SHEET 2 OF 4

PROFORMCIVIL ENGINEERING GROUP
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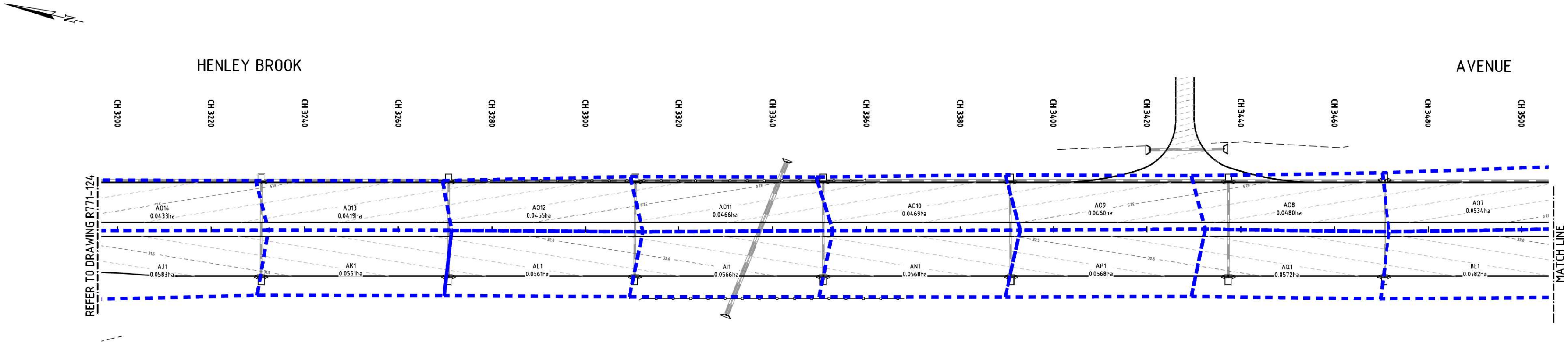
DRAWING No: R771-123

REV No: 0

OPERATIONS



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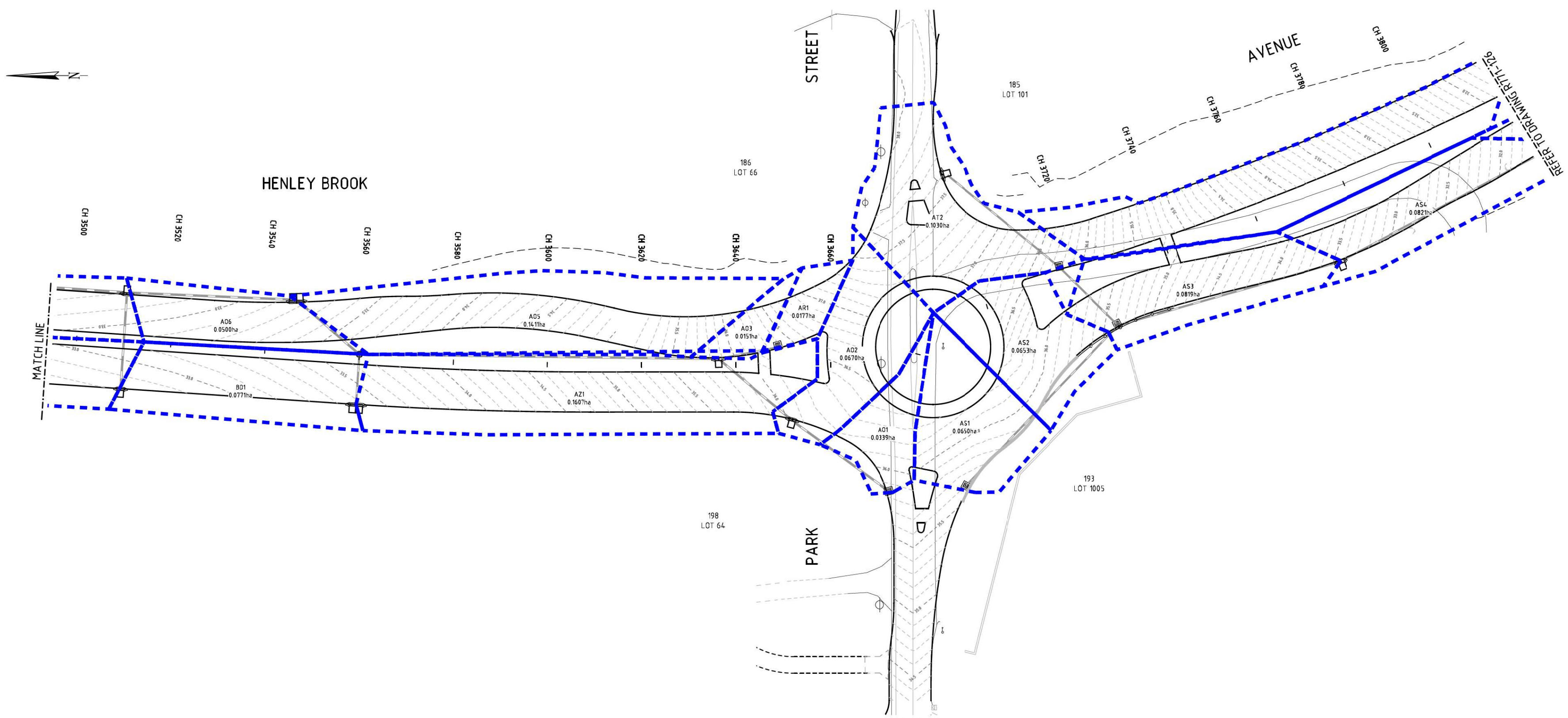

PLAN
SCALE 1:500

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AMENDMENTS

AUTHORISATION
PROJECT MANAGER DATE
APPROVED
DESIGN CO-ORDINATOR DATE
DESIGNED D.WEERTS CHECKED DATE DRAWN C.CAYATTE

SCALE: 1:500 (A1)
DATUM: A.H.D.

HENLEY BROOK AVE - STAGE 3
MESSARA AVENUE TO PARK STREET
DUAL CARRIAGEWAY
DRAINAGE CATCHMENT PLAN SHEET 3 OF 4

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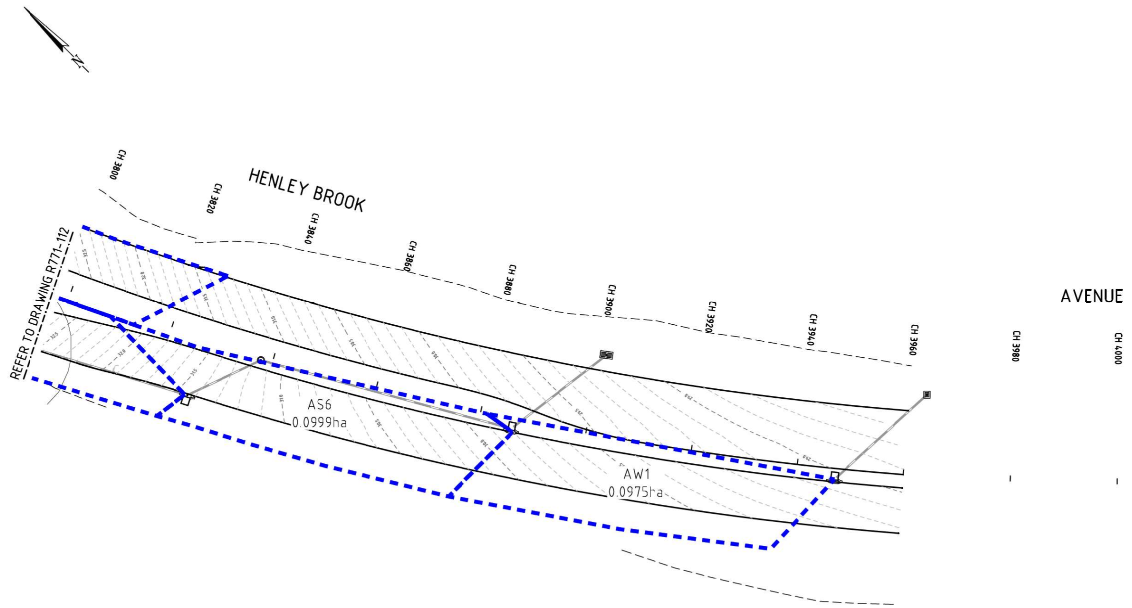
DRAWING No: R771-124
REV No: 0

OPERATIONS



PLAN

SCALE 1:500

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REV	DATE	BY	DESCRIPTION
0	04.23	DW	ISSUED FOR CONSTRUCTION

AMENDMENTS

AUTHORISATION: PROJECT MANAGER ___ DATE ___ | APPROVED: DESIGN CO-ORDINATOR ___ DATE ___
DESIGNED D.WEERTS CHECKED ___ DATE ___ DRAWN C.CAYATTE

SCALE: 1:500 (A1)
DATUM: A.H.D.

HENLEY BROOK AVE - STAGE 3

MESSARA AVENUE TO PARK STREET

DUAL CARRIAGEWAY

DRAINAGE CATCHMENT PLAN SHEET 4 OF 4

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city of swan

DRAWING No: R771-125
REV No: 0

OPERATIONS

HYDRAULICS Q10 (10% AEP)

Node Name (-)	Node Type (-)	Setout Easting (m)	Setout Northing (m)	Setout RL (m)	Grate RL (m)	Cover RL (m)	Catch ID (-)	Tc Method (-)	Catch Length (m)	Catch Slope (%)	Catch Retardance (-)	Time Tc (min)	Intensity I (mm/hr)	Runoff C (-)	Area A (ha)	Full CA (ha)	Full Sum CA (ha)	Full Qc=CIA (L/s)	Partial CA (ha)	Partial Sum CA (ha)	Partial Qc=CIA (L/s)	Catchment Flow Qc (L/s)	Direct Flow Qdg (L/s)	Approach Flow Qa (L/s)	Road Capacity (L/s)	Flooded Depth (m)	Flooded Width (m)	Flooded Vel.Dep (sq.m/s)	Road Grade (%)	Road Xfall (%)	Max Pond Depth (m)	Choke Factor (-)	Inlet Curve Name (-)	Inlet Flow Qg (L/s)	Bypass Flow Qb (L/s)	Bypass Node (-)
A1	SEP	65368.86	280499.42	36.16	36.16	36.16																		0										0		-
A2	MH	65371.15	280502.61	36.16	36.06	36.06																														-
AB1	HW	65486.16	279492.43	30.62	31.63	31.63	1I	Direct				5	117.65	0.9	0.1133	0.102	6.8632	178.8	0.102	0.205	67	178.8		178.8										178.8		-
							3P	Kinematic Wave	790.59	0.5	0.25	328.23	9.38	0.4	15.9029	6.7612			0.103																	
AB2	GULLY	65492.2	279489.75	31.66	31.66	31.66	1I	Direct				5	117.65	0.9	0.068	0.0612	0.1598	19.1	0.0612	0.0765	25	25		25	244.8	0.049	0.9	0.04	2.1	301.1		1	2G,5.0X	21.5	3.5	LOST
							3P	Kinematic Wave	100	2.5	0.25	32.17	42.98	0.4	0.2466	0.0986			0.0153																	
AB3	MH	65514.09	279474.46	32.37	32.37	32.37																														-
AB4	MH	65517.33	279468.57	32.39	32.39	32.39																														-
AB5	GULLY	65544.37	279418.43	31.54	31.54	30.55																														-
AD1	GULLY	65571.33	279487.82	31.78	31.78	31.78	1I	Direct				5	117.65	0.9	0.0692	0.0623	0.0623	20.4	0.0623	0.0623	20.4	20.4		20.4	397	0.044					0.3	1		20.4		LOST
AD2	GULLY	65570.94	279473.87	31.84	31.84	31.84	1I	Direct				5	117.65	0.9	0.0542	0.0487	0.0487	15.9	0.0487	0.0487	15.9	15.9		15.9	397	0.038					0.3	1		15.9		LOST
AF1	SEP	65537.14	279398.8	31.35	31.35	31.35																		0					0.8	2.6		1	1G,1.5X	0		AG1
AG1	SEP	65535.73	279378.53	31.24	31.24	31.24																		0					0.4	3		1	0.5G,3.0X	0		AO15
AH1	HW Triple	65472.95	279356.43	29.88	33	30.88																														-
AH2	HW outlet Triple	65538.75	279361.72	29.68	31.2	30.68																														-
AI1	SEP	65502.9	279200.58	31.85	31.85	31.85	1I	Direct				5	117.65	0.9	0.0566	0.0509	0.0509	16.6	0.0509	0.0509	16.6	16.6		17.1	482.9	0.049	1.78	0.02	0.5	3		1	0.5G,3.0X	16.7	0.4	AL1
AJ1	SEP	65512.36	279319.99	31.3	31.3	31.3	1I	Direct				5	117.65	0.9	0.0583	0.0524	0.0524	17.1	0.0524	0.0524	17.1	17.1		17.5	476.7	0.052	1.9	0.02	0.4	3		1	0.5G,1.5X	15.5	2	BG1
AK1	SEP	65508.83	279280.22	31.47	31.47	31.47	1I	Direct				5	117.65	0.9	0.0551	0.0496	0.0496	16.2	0.0496	0.0496	16.2	16.2		16.6	498	0.049	1.76	0.02	0.5	3		1	0.5G,3.0X	16.3	0.3	AJ1
AL1	SEP	65506.05	279240.31	31.66	31.66	31.66	1I	Direct				5	117.65	0.9	0.0561	0.0505	0.0505	16.5	0.0505	0.0505	16.5	16.5		16.9	482.9	0.049	1.77	0.02	0.5	3		1	0.5G,3.0X	16.5	0.4	AK1
AM1	HW Double	65493.63	279181.58	30.37	31.14	31.14	3P	Kinematic Wave	597.18	0.4	0.25	296.87	10.01	0.4	18.6082	7.4433	7.4433	207	7.4433	7.4433	207	207		207										207		-
AM2	HW outlet Double	65525.35	279166.53	30.17	30.95	30.95																														-
AN1	SEP	65500.49	279160.43	32.05	32.05	32.05	1I	Direct				5	117.65	0.9	0.0568	0.0511	0.0511	16.7	0.0511	0.0511	16.7	16.7		17.3	482.9	0.049	1.79	0.02	0.5	3		1	0.5G,3.0X	16.9	0.5	AI1
AO1	GULLY	65467.16	278839.28	35.83	35.83	35.83	1I	Direct				5	117.65	0.9	0.0339	0.0305	11.8964	1420.2	0.0305	1.8748	612.7	1420.2		1420.2	1579.1	0.146	5.96	0.36	3.2	1		1	4G,0.5X	74	1346.2	LOST
							3P	Kinematic Wave	100	2.5	0.25	32.17	42.98	0.4	29.6648	11.8659			1.8443																	
AO2	SEP	65482.53	278859.15	36.03	36.03	36.03	1I	Direct				5	117.65	0.9	0.067	0.0603	0.0603	19.7	0.0603	0.0603	19.7	19.7		19.7	1475.2	0.032	1.74	0.02	2.7	1.9		1	2G,1.5X	13.9	5.8	AZ1
AO3	SEP	65495.39	278874.71	35.87	35.87	35.87	1I	Direct				5	117.65	0.9	0.0151	0.0136	0.0136	4.5	0.0136	0.0136	4.5	4.5		4.5	3048.7	0.014	1.53	0.01	3.9	1		1	4G,0.5X	3.6	0.9	LOST
AO4	MH	65496.55	278950.97	33.78	33.78	33.78																														-
AO5	SEP TWIN	65507.66	278964.22	33.16	33.16	33.16	1I	Direct				5	117.65	0.9	0.1411	0.127	0.127	41.5	0.127	0.127	41.5	41.5		41.5	553.5	0.056	1.95	0.04	1.5	3		1	2G,3.0X	29.6	11.9	AO6
AO6	SEP	65509.37	279000.2	32.81	32.81	32.81	1I	Direct				5	117.65	0.9	0.05	0.045	0.045	14.7	0.045	0.045	14.7	14.7		26.6	321.6	0.059	2.06	0.03	0.6	3		1	0.5G,3.0X	23	3.6	AO7
AO7	SEP	65512.51	279039.32	32.62	32.62	32.62	1I	Direct				5	117.65	0.9	0.0534	0.0481	0.0481	15.7	0.0481	0.0481	15.7	15.7		19.4	321.6	0.052	1.83	0.02	0.5	3		1	0.5G,3.0X	18.5	0.9	AO8
AO8	SEP	65514.42	279072.59	32.46	32.46	32.46	1I	Direct				5	117.65	0.9	0.048	0.0432	0.0432	14.1	0.0432	0.0432	14.1	14.1		15	321.6	0.048	1.66	0.02	0.5	3		1	0.5G,3.0X	15		AO9
AO9	SEP	65517.66	279119.16	32.23	32.23	32.23	1I	Direct				5	117.65	0.9	0.046	0.0414	0.0414	13.5	0.0414	0.0414	13.5	13.5		13.5	321.6	0.046	1.6	0.02	0.5	3		1	0.5G,3.0X	13.5		AO10
AO10	SEP	65520.44	279159.06	32.04	32.04	32.04	1I	Direct				5	117.65	0.9	0.0469	0.0422	0.0422	13.8	0.0422	0.0422	13.8	13.8		13.8	321.6	0.046	1.61	0.02	0.5	3		1	0.5G,3.0X	13.8		AO11
AO11	SEP	65523.22	279198.96	31.85	31.85	31.85	1I	Direct				5	117.65	0.9	0.0466	0.042	0.042	13.7	0.042	0.042	13.7	13.7		13.7	321.6	0.046	1.61	0.02	0.5	3		1	0.5G,3.0X	13.7		AO12
AO12	SEP	65526	279238.87	31.66	31.66	31.66	1I	Direct				5	117.65	0.9	0.0455	0.041	0.041	13.4	0.041	0.041	13.4	13.4		13.4	321.6	0.046	1.59	0.02	0.5	3		1	0.5G,3.0X	13.4		AO13
AO13	SEP	65529.22	279278.74	31.46	31.46	31.46	1I	Direct				5	117.65	0.9	0.0419	0.0377	0.0377	12.3	0.0377	0.0377	12.3	12.3		12.3	321.6	0.044	1.54	0.02	0.5	3		1	0.5G,3.0X	12.3		AO14
AO14	SEP	65531.56	279318.67	31.27	31.27	31.27	1I	Direct				5	117.65	0.9	0.0433	0.039	0.039	12.7	0.039	0.039	12.7	12.7		12.7	283.5	0.047	1.64	0.02	0.5	3		1	0.5G,3.0X	12.7		AO15
AO15	COMBO SEP TWIN	65533.97	279353.34	31.2	31.2	31.2	1I	Direct				5	117.65	0.9	0.0812	0.0731	0.0731	23.9	0.0731	0.0731	23.9	23.9		23.9	36.8	0.036					0.045	1		23.9		-
AO16	HW outlet	65539.1	279355.93	29.7	31.2	31.2																														-
AP1	SEP	65497.7	279120.4	32.24	32.24	32.24	1I	Direct				5	117.65	0.9	0.0568	0.0511	0.0511	16.7	0.0511	0.0511	16.7	16.7		18.1	482.9	0.05	1.82	0.02	0.5	3		1	0.5G,3.0X	17.5	0.6	AN1
AQ1	SEP	65494.47	279074.03	32.47	32.47	32.47	1I	Direct				5	117.65	0.9	0.0572	0.0515	0.0515	16.8	0.0515	0.0515	16.8	16.8		21	482.9	0.053	1.93	0.02	0.5	3		1	0.5G,3.0X	19.6	1.4	AP1
AR1	GULLY	65497.64	278862.01	36.37	36.37	36.37	1I	Direct				5	117.65	0.9	0.0177	0.0159	0.0159	5.2	0.0159	0.0159	5.2	5.2		5.2	1158.9	0.02	0.89	0.01	3.9	2.3		1	4G,1.5X	5.1	0.1	AO3
AS1	GULLY	65468.1	278821.88	35.57	35.57	35.57	1I	Direct				5	117.65	0.9	0.065	0.0585	0.0585	19.1	0.0585	0.0585	19.1	19.1		19.1										19.1		-
AS2	GULLY	65502.03	278789.94	35.36	35.36	35.36	1I	Direct				5	117.65	0.9	0.0653	0.0588	0.0588	19.2	0.0588	0.0588	19.2	19.2		19.2	7073.4	0.035	1.24	0.03	3.9	2.8		1	4G,1.5X	13.7	5.5	AS3
AS3	SEP	65515.67	278742.79	33.44	33.44	33.54	1I	Direct				5	117.65	0.9	0.0819	0.0737	0.0737	24.1	0.0737	0.0737	24.1	24.1		29.6	1278	0.041	1.49	0.04	3.7	3.1		1	4G,3.0X	17.9	11.8	AS4
AS4	SEP	65541.56	278694.49	31.44	31.44	31.44	1I	Direct				5	117.65	0.9	0.0821	0.0739	0.0739	24.1	0.0739	0.0739	24.1	24.1		35.9	2594.8	0.034	2.73	0.03	3	1.5		1	2G,1.5X	18.8	17.1	AS6
AS5	MH	65555.9	278689.43	31.3	31.3	31.3																														-
AS6	SEP	65579.52	278646.89	29.81	29.81	29.81	1I	Direct				5	117.65	0.9	0.0999	0.0899	0.0899	29.4	0.0899	0.0899	29.4	29.4		46.5	633.5	0.055	1.92	0.05	2.1	3		1	2G,3.0X	26	20.6	AW1
AS7	GULLY TWIN	65602.37	278644.4	28.76	28.76	28.76																														-
AT1	SEP	65534.28	278827.3	37.6	37.6	37.6																		0					2.5	3		1	2G,1.5X	0		LOST
AT2	GULLY	65514.31	278802.33	36.21	36.21	36.21	1I	Direct				5	117.65	0.9	0.103	0.0927	0.0927	30.3	0.0927	0.0927	30.3	30.3		30.3	0.4	0.005	0.72	0.09	4.2	2.6		1	4G,1.5X	20.1	10.2	LOST
AW1	SEP	65615.78	278597.47	29.05	29.05	29.05	1I	Direct				5	117.65	0.9	0.0975	0.0878	32.9905	1032.9	0.0878	0.7521	245.8	1032.9		1053.5	337.9	0.15	5.81	0.4	0.6	3		1	0.5G,3.0X	105	948.5	LOST
							3P	Kinematic Wave	624.5	0.6	0.25	247.65	11.27	0.4	82.2567	32.9027			0.6643																	
AW2	GULLY	65639.59	278596.7	28.15	28.15	28.15																														-
AZ1	SEP TWIN	65485.95	278951.69	33.37	33.37	33.37	1I	Direct				5	117.65	0.9	0.1607	0.1447	0.1447	47.3	0.1447	0.1447	47.3	47.3		53.1	945.1	0.058	2.12	0.05	2	3		1	2G,3.0X	34.2	18.9	BD1
B1	SEP TWIN	65381.44	280449.66	36.37	36.37	36.37	1I	Direct				5	117.65	0.9	0.0753	0.0678	0.0678	22.2	0.0678	0.0678	22.2	22.2		22.2	6816.1	0.05	1.75	0.03	0.8	3		1	1G,1.5X	19.1	3.1	LOST
BB1	COMBO SEP	65408.88	280240.86	35.43	35.43	35.43	1I	Direct				5	117.65	0.9	0.1226	0.1103	0.1103	36	0.1103	0.1103	36	36		54.7	5809.6	0.069	2.42	0.05	0.9	3		0.61	1G,3.0X	21.5	33.2	J2
BB2	MH	65409.58	280242.28	35.69	35.69	35.69																														-
BC1	SEP	65422.38	280246.13	35.43	35.43	35.43	1I	Direct				5	117.65	0.9	0.0723	0.0651	0.0651	21.3	0.0651	0.0651	21.3	21.3		27.1	454.9	0.052	1.82	0.03	1	3		1	1G,3.0X	21.3	5.8	I1
BC2	MH	65423.87	280247.73	35.44	35.44	35.44																														-
BD1	SEP	65489.42	279001.59	32.82	32.82	32.82	1I	Direct				5	117.65	0.9	0.0771	0.0694	0.0694	22.7	0.0694	0.0694	22.7	22.7		41.5	482.9	0.069	2.49	0.03	0.5	3		1	0.5G,3.0X	30.6	10.9	BE1
BE1	SEP	65492.15	279040.81	32.63	32.63	32.63	1I	Direct				5	117.65	0.9	0.0582	0.0524	0.0524	17.1	0.0524	0.0524	17.1	17.1		28	482.9	0.059	2.14	0.03	0.5	3		1	0.5G,3.0X	23.8	4.2	AQ1
BF1	GULLY	65490.55	279367.73	30.65	30.65	30.65	1I	Direct				5	117.65	0.9	0.1269	0.1142	0.1142	37.3	0.1142	0.1142	37.3	37.3		37.3										37.3		-
BF2	MH	65491.14	279359.76	30.6	31.86	31.2																														-
BG1	COMBO SEP TWIN	65511.88	279347.43	31.26	31.26	31.26	1I	Direct				5	117.65	0.9	0.089	0.0801	0.0801	26.2	0.0801	0.0801	26.2	26.2		28.2	35.3	0.042					0.047	1		28.2		-
C1	SEP TWIN	65367.05	280442.53	36.4	36.4	36.4	1I	Direct				5	117.65	0.9	0.1055	0.0949	0.0949	31	0.0949	0.0949	31	31		31	5675.7	0.056	1.97	0.03	0.8	3		1	1G,3.0X	27.6	3.4	LOST
Ex J1	MH	65368.75	280447.07	36.77	36.57	36.57																														-
D1	GULLY	65347.56	280369.4	37.08	37.08	37.08	1I	Direct				5	117.65	0.9	0.04	0.036	0.036	11.8	0.036	0.036	11.8	11.8		11.8	238.5	0.021	2.96	0.01	1.3	1		1	1G,0.5X	6.7	5.1	LOST
D2	MH	65353.57	280366.23	37.08	37.08	37.08																														-
E1	SEP	65393.2	280341.26	36.39	36.39	36.39	1I	Direct				5	117.65	0.9	0.0723	0.065	0.065	21.3	0.065	0.065	21.3	21.3		21.3	390.5	0.049	1.72	0.02	0.7	3		1	0.5G,3.0X	19.8	1.5	H1
Ex Ak3	MH	65380.84	280338.34	36.77	36.77	36.77																														-
F1	COMBO SEP	65379.58	280335.58	36.28	36.28	36.28	1I	Direct				5	117.65	0.9	0.1301	0.1171	0.1171	38.3	0.1171	0.1171	38.3	38.3		38.3	2975.7	0.061	2.12	0.04	0.9	3.5		1	1G,3.0X	27	11.3	G1
G1	SEP	65391.73	280289.01	35.87	35.87	35.87	1I	Direct				5	117.65	0.9	0.125	0.1125	0.1125	36.8	0.1125	0.1125	36.8	36.8		48.1	2995.4	0.066	2.31	0.04	0.9	3.5		1	1G,3.0X	29.4	18.6	BB1
G2	MH	65391.42	280290.03	35.87	35.87	35.87																														-
H1	SEP	65405.51	280293.54	35.92	35.92	35.92	1I	Direct				5	117.65	0.9	0.0677	0.0609	0.0609	19.9	0.0609	0.0609	19.9	19.9		21.4	447.4	0.047	1.67	0.03	1	3		1	1G,1.5X	15.6	5.8	BC1
I1	SEP	65443.4	280192.46	34.88	34.88	34.88	1I	Direct				5	117.65	0.9	0.1318	0.1186	0.1186	38.8	0.1186	0.1186	38.8	38.8		44.6	454.9	0.063	2.2	0.04	1	3		1	1G,3.0X	28.4	16.2	K1
J1	COMBO SEP	65436.92	280169.22	34.77	34.77	34.77	1I	Direct				5	117.65	0.9	0.0455	0.041	0.041	13.4	0.041	0.041	13.4	13.4		22.7	2797.2	0.045	2.07	0.02	0.9	2.2		1	1G,1.5X	15.1	7.6	LOST
J2	GULLY	65429.8	280187.43	34.94	34.94	34.94																		33.2	2584.7	0.057	2.01	0.03	0.9	3		1	1G,3.0X	23.9	9.3	J1
K1	SEP	65461.39	280146.51	34.41	34.41	34.41	1I	Direct				5	117.65	0.9	0.0514	0.0462	0.0462	15.1	0.0462	0.0462	15.1	15.1		31.3	1672.8	0.055	1.92	0.03	1	3		1	1G,3.0X	23.5	7.8	M1
K2	MH	65449.14	280141.65	34.71	34.71	34.71																														-
K3	COMBO SEP	65440.01	280138.03	34.39	34.39	34.39	1I	Direct				5	117.65	0.9	0.0731	0.0658	0.0658	21.5	0.0658	0.0658	21.5	21.5		21.5	2285	0.028	2.99	0.01	1.9	0.9		1	2G,0.5X	10.5	11.1	M2
L1	GULLY	65455.38	280128	34.44	34.44	34.44	1I	Direct				5	117.65	0.9	0.029	0.0261	0.0261	8.5	0.0261	0.0261	8.5	8.5		8.5	114	0.028	1.5	0.01	1.1	2		1	1G,1.5X	6.8	1.7	LOST
M1	COMBO SEP TWIN	65484.27	280088.05	33.91	33.91	33.91	1I	Direct				5	117.65	0.9	0.1212	0.1091	0.1091	35.6	0.1091	0.1091	35.6	35.6		43.4	70.7	0.053					0.071	1		43.4		LOST
M2	COMBO SEP TWIN	65458.92	280080.13	33.71	33.71	33.71																		28.8	1540.7	0.076	2.74	0.02	0.1	3		1	0.5G,3.0X	28.8		LOST
M3	MH	65454.96	280079.02	33.71	33.71	33.97																														-
N1	HW	65521.81	279075.98	31	31.86	31.86																		0										0		-
N2	HW outlet	65522.52	279088.07	30.93	31.79	31.79																														-
O1	SEP	65498.65	280051.33	34.22	34.22	34.22	1I	Direct				5	117.65	0.9	0.0849	0.0764	0.0764	25	0.0764	0.0764	25	25		25	723.6	0.042	1.67	0.03	2	2.6		1	2G,1.5X	15.5	9.5	LOST
R1	SEP	65515.67	279984.54	35.96	35.96	35.96	1I	Direct				5	117.65	0.9	0.0514	0.0462	0.0462	15.1	0.0462	0.0462	15.1	15.1		18.9	1018.1	0.034	1.74	0.02	2.1	2		1	2G,1.5X	13.6	5.4	LOST
R2	SEP	65494.91	279997.78	35.24	35.24	35.24	1I	Direct				5	117.65	0.9	0.1085	0.0976	0.0976	31.9	0.0976	0.0976	31.9	31.9		42.5	1079.4	0.051	1.85	0.05	2.4	3		1	2G,3.0X	24.7	17.7	M2
Q1	SEP	65530.46	279942.86	36.72	36.72	36.72	1I	Direct				5	117.65	0.9	0.0749	0.0674	0.0674	22	0.0674	0.0674	22	22		22	500.9	0.046	1.6	0.03	1.2	3		1	1G,3.0X	18.2	3.8	R1
Q2	SEP	65516.35	279938.44	36.43	36.43	36.43	1I	Direct				5	117.65	0.9	0.0995	0.0896	0.0896	29.3	0.0896	0.0896	29.3	29.3		29.3	765.8	0.05	1.83	0.03	1.2	3		1	1G,1.5X	18.7	10.6	R2
Q3	MH	65491.73	279996.69	35.23	35.23	35.4																														-
Q5	MH	65469.14	279984.94	35.28	35.28	33																														-
S1	SEP	65554.08	279799.17	36.48	36.48	36.48	1I	Direct				5	117.65	0.9	0.0942	0.0848	0.0848	27.7	0.0848	0.0848	27.7	27.7		27.7	543	0.048	1.67	0.03	1.6	3		1	2G,3.0X	19.1	8.6	U1

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CAUTION
SERVICES SHOWN ARE TO BE USED AS A GUIDE ONLY. SERVICES SHALL BE MANUALLY LOCATED BY HAND PRIOR TO MECHANICAL EXCAVATION. RELEVANT PERMITS SHALL BE OBTAINED PRIOR TO SITE WORKS AND A DBYD ENQUIRY SHALL BE UNDERTAKEN NO EARLIER THAN 30 DAYS BEFORE CONSTRUCTION. A FULL SET OF THE DBYD DOCUMENTS ARE TO BE KEPT ON SITE AT ALL TIMES. CONFLICTING SERVICES ARE TO BE RELOCATED/PROTECTED TO THE SATISFACTION OF THE SERVICE AUTHORITY PRIOR TO WORKS.

REV	DATE	BY	DESCRIPTION
0	04.23	DW	ISSUED FOR CONSTRUCTION

AMENDMENTS

AUTHORISATION — PROJECT MANAGER / DATE
APPROVED — DESIGN CO-ORDINATOR / DATE
DESIGNED D.WEERTS CHECKED DATE DRAWN C.CAYATTE

SCALE: (A1)
DATUM: A.H.D.

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DRAWING No: R771-126
REV No: 0

OPERATIONS

HYDROLOGY Q10 (10% AEP)

Node	Node	Setout	Setout	Setout	Grate	Cover	Catch	Tc	Catch	Catch	Catch	Time	Intensity	Runoff	Area	Full	Full	Full	Partial	Partial	Partial	Catchment	Direct	Approach	Road	Flooded	Flooded	Flooded	Road	Road	Max Pond	Choke	Inlet	Inlet	Bypass	Bypass
Name	Type	Easting	Northing	RL	RL	RL	ID	Method	Length	Slope	Retardance	Tc	I	C	A	CA	Sum CA	Qc=CIA	CA	Sum CA	Qc=CIA	Flow Qc	Flow Qdg	Flow Qa	Capacity	Depth	Width	Vel.Dep	Grade	Xfall	Depth	Factor	Curve Name	Flow Qg	Flow Qb	Node
(-)	(-)	(m)	(m)	(m)	(m)	(m)	(-)	(-)	(m)	(%)	(-)	(min)	(mm/hr)	(-)	(ha)	(ha)	(ha)	(L/s)	(ha)	(ha)	(L/s)	(L/s)	(L/s)	(L/s)	(m)	(m)	(sq.m/s)	(%)	(%)	(m)	(-)	(-)	(L/s)	(L/s)	(-)
A1	SEP	65368.86	280499.42	36.16	36.16	36.16																		0										0		-
A2	MH	65371.15	280502.61	36.16	36.06	36.06																														-
AB1	HW	65486.16	279492.43	30.62	31.63	31.63	1l	Direct				5	117.65	0.9	0.1133	0.102	6.8632	178.8	0.102	0.205	67	178.8		178.8										178.8		-
							3P	Kinematic Wave	790.59	0.5	0.25	328.23	9.38	0.4	16.9029	6.7612			0.103																	
AB2	GULLY	65492.2	279489.75	31.66	31.66	31.66	1l	Direct				5	117.65	0.9	0.068	0.0612	0.1598	19.1	0.0612	0.0765	25	25		25	244.8	0.049	0.9	0.04	2.1	301.1		1	2G,5.0X	21.5	3.5	LOST
							3P	Kinematic Wave	100	2.5	0.25	32.17	42.98	0.4	0.2466	0.0986			0.0153																	
AB3	MH	65514.09	279474.46	32.37	32.37	32.37																														-
AB4	MH	65517.33	279468.57	32.39	32.39	32.39																														-
AB5	GULLY	65544.37	279418.43	31.54	31.54	30.55																														-
AD1	GULLY	65571.33	279487.82	31.78	31.78	31.78	1l	Direct				5	117.65	0.9	0.0692	0.0623	0.0623	20.4	0.0623	0.0623	20.4	20.4		20.4	397	0.044					0.3	1		20.4		LOST
AD2	GULLY	65570.94	279473.87	31.84	31.84	31.84	1l	Direct				5	117.65	0.9	0.0542	0.0487	0.0487	15.9	0.0487	0.0487	15.9	15.9		15.9	397	0.038					0.3	1		15.9		LOST
AF1	SEP	65537.14	279398.8	31.35	31.35	31.35																		0					0.8	2.6		1	1G,1.5X	0		AG1
AG1	SEP	65535.73	279378.53	31.24	31.24	31.24																		0					0.4	3		1	0.5G,3.0X	0		AO15
AH1	HW Triple	65472.95	279356.43	29.88	33	30.88																														-
AH2	HW outlet Triple	65538.75	279361.72	29.68	31.2	30.68																														-
AI1	SEP	65502.9	279200.58	31.85	31.85	31.85	1l	Direct				5	117.65	0.9	0.0566	0.0509	0.0509	16.6	0.0509	0.0509	16.6	16.6		17.1	482.9	0.049	1.78	0.02	0.5	3		1	0.5G,3.0X	16.7	0.4	AL1
AJ1	SEP	65512.36	279319.99	31.3	31.3	31.3	1l	Direct				5	117.65	0.9	0.0583	0.0524	0.0524	17.1	0.0524	0.0524	17.1	17.1		17.5	476.7	0.052	1.9	0.02	0.4	3		1	0.5G,1.5X	15.5	2	BG1
AK1	SEP	65508.83	279280.22	31.47	31.47	31.47	1l	Direct				5	117.65	0.9	0.0551	0.0496	0.0496	16.2	0.0496	0.0496	16.2	16.2		16.6	498	0.049	1.76	0.02	0.5	3		1	0.5G,3.0X	16.3	0.3	AJ1
AL1	SEP	65505.05	279240.31	31.66	31.66	31.66	1l	Direct				5	117.65	0.9	0.0561	0.0505	0.0505	16.5	0.0505	0.0505	16.5	16.5		16.9	482.9	0.049	1.77	0.02	0.5	3		1	0.5G,3.0X	16.5	0.4	AK1
AM1	HW Double	65493.63	279181.58	30.37	31.14	31.14	3P	Kinematic Wave	597.18	0.4	0.25	296.87	10.01	0.4	18.6082	7.4433	7.4433	207	7.4433	7.4433	207	207		207										207		-
AM2	HW outlet Double	65525.35	279166.53	30.17	30.95	30.95																														-
AN1	SEP	65500.49	279160.43	32.05	32.05	32.05	1l	Direct				5	117.65	0.9	0.0568	0.0511	0.0511	16.7	0.0511	0.0511	16.7	16.7		17.3	482.9	0.049	1.79	0.02	0.5	3		1	0.5G,3.0X	16.9	0.5	AI1
AO1	GULLY	65467.16	278839.28	35.83	35.83	35.83	1l	Direct				5	117.65	0.9	0.0339	0.0305	11.8964	1420.2	0.0305	1.8748	612.7	1420.2		1420.2	1579.1	0.146	5.96	0.36	3.2	1		1	4G,0.5X	74	1346.2	LOST
							3P	Kinematic Wave	100	2.5	0.25	32.17	42.98	0.4	29.6648	11.8659			1.8443																	
AO2	SEP	65482.53	278859.15	36.03	36.03	36.03	1l	Direct				5	117.65	0.9	0.067	0.0603	0.0603	19.7	0.0603	0.0603	19.7	19.7		19.7	1475.2	0.032	1.74	0.02	2.7	1.9		1	2G,1.5X	13.9	5.8	AZ1
AO3	SEP	65495.39	278874.71	35.87	35.87	35.87	1l	Direct				5	117.65	0.9	0.0151	0.0136	0.0136	4.5	0.0136	0.0136	4.5	4.5		4.5	3048.7	0.014	1.53	0.01	3.9	1		1	4G,0.5X	3.6	0.9	LOST
AO4	MH	65496.55	278950.97	33.78	33.78	33.78																														-
AO5	SEP TWIN	65507.66	278964.22	33.16	33.16	33.16	1l	Direct				5	117.65	0.9	0.1411	0.127	0.127	41.5	0.127	0.127	41.5	41.5		41.5	553.5	0.056	1.95	0.04	1.5	3		1	2G,3.0X	29.6	11.9	AO6
AO6	SEP	65509.37	279000.2	32.81	32.81	32.81	1l	Direct				5	117.65	0.9	0.05	0.045	0.045	14.7	0.045	0.045	14.7	14.7		26.6	321.6	0.059	2.06	0.03	0.6	3		1	0.5G,3.0X	23	3.6	AO7
AO7	SEP	65512.51	279039.32	32.62	32.62	32.62	1l	Direct				5	117.65	0.9	0.0534	0.0481	0.0481	15.7	0.0481	0.0481	15.7	15.7		19.4	321.6	0.052	1.83	0.02	0.5	3		1	0.5G,3.0X	18.5	0.9	AO8
AO8	SEP	65514.42	279072.59	32.45	32.46	32.46	1l	Direct				5	117.65	0.9	0.048	0.0432	0.0432	14.1	0.0432	0.0432	14.1	14.1		15	321.6	0.048	1.66	0.02	0.5	3		1	0.5G,3.0X	15		AO9
AO9	SEP	65517.66	279119.16	32.23	32.23	32.23	1l	Direct				5	117.65	0.9	0.046	0.0414	0.0414	13.5	0.0414	0.0414	13.5	13.5		13.5	321.6	0.046	1.6	0.02	0.5	3		1	0.5G,3.0X	13.5		AO10
AO10	SEP	65520.44	279159.06	32.04	32.04	32.04	1l	Direct				5	117.65	0.9	0.0469	0.0422	0.0422	13.8	0.0422	0.0422	13.8	13.8		13.8	321.6	0.046	1.61	0.02	0.5	3		1	0.5G,3.0X	13.8		AO11
AO11	SEP	65523.22	279198.96	31.85	31.85	31.85	1l	Direct				5	117.65	0.9	0.0466	0.042	0.042	13.7	0.042	0.042	13.7	13.7		13.7	321.6	0.046	1.61	0.02	0.5	3		1	0.5G,3.0X	13.7		AO12
AO12	SEP	65526	279238.87	31.66	31.66	31.66	1l	Direct				5	117.65	0.9	0.0455	0.041	0.041	13.4	0.041	0.041	13.4	13.4		13.4	321.6	0.046	1.59	0.02	0.5	3		1	0.5G,3.0X	13.4		AO13
AO13	SEP	65529.22	279278.74	31.46	31.46	31.46	1l	Direct				5	117.65	0.9	0.0419	0.0377	0.0377	12.3	0.0377	0.0377	12.3	12.3		12.3	321.6	0.044	1.54	0.02	0.5	3		1	0.5G,3.0X	12.3		AO14
AO14	SEP	65531.56	279318.67	31.27	31.27	31.27	1l	Direct				5	117.65	0.9	0.0433	0.039	0.039	12.7	0.039	0.039	12.7	12.7		12.7	283.5	0.047	1.64	0.02	0.5	3		1	0.5G,3.0X	12.7		AO15
AO15	COMBO SEP TWIN	65533.97	279353.34	31.2	31.2	31.2	1l	Direct				5	117.65	0.9	0.0812	0.0731	0.0731	23.9	0.0731	0.0731	23.9	23.9		23.9	36.8	0.036					0.045	1		23.9		-
AO16	HW outlet	65539.1	279355.93	29.7	31.2	31.2																														-
AP1	SEP	65497.7	279120.4	32.24	32.24	32.24	1l	Direct				5	117.65	0.9	0.0568	0.0511	0.0511	16.7	0.0511	0.0511	16.7	16.7		18.1	482.9	0.05	1.82	0.02	0.5	3		1	0.5G,3.0X	17.5	0.6	AN1
AQ1	SEP	65494.47	279074.03	32.47	32.47	32.47	1l	Direct				5	117.65	0.9	0.0572	0.0515	0.0515	16.8	0.0515	0.0515	16.8	16.8		21	482.9	0.053	1.93	0.02	0.5	3		1	0.5G,3.0X	19.6	1.4	AP1
AR1	GULLY	65497.64	278862.01	36.37	36.37	36.37	1l	Direct				5	117.65	0.9	0.0177	0.0159	0.0159	5.2	0.0159	0.0159	5.2	5.2		5.2	1158.9	0.02	0.89	0.01	3.9	2.3		1	4G,1.5X	5.1	0.1	AO3
AS1	GULLY	65468.1	278821.88	35.57	35.57	35.57	1l	Direct				5	117.65	0.9	0.065	0.0585	0.0585	19.1	0.0585	0.0585	19.1	19.1		19.1										19.1		-
AS2	GULLY	65502.03	278789.94	35.36	35.36	35.36	1l	Direct				5	117.65	0.9	0.0653	0.0588	0.0588	19.2	0.0588	0.0588	19.2	19.2		19.2	7073.4	0.035	1.24	0.03	3.9	2.8		1	4G,1.5X	13.7	5.5	AS3
AS3	SEP	65515.67	278742.79	33.44	33.44	33.54	1l	Direct				5	117.65	0.9	0.0819	0.0737	0.0737	24.1	0.0737	0.0737	24.1	24.1		29.6	1278	0.041	1.49	0.04	3.7	3.1		1	4G,3.0X	17.9	11.8	AS4
AS4	SEP	65541.56	278694.49	31.44	31.44	31.44	1l	Direct				5	117.65	0.9	0.0821	0.0739	0.0739	24.1	0.0739	0.0739	24.1	24.1		35.9	2594.8	0.034	2.73	0.03	3	1.5		1	2G,1.5X	18.8	17.1	AS6
AS5	MH	65555.9	278689.43	31.3	31.3	31.3																														-
AS6	SEP	65579.52	278646.89	29.81	29.81	29.81	1l	Direct				5	117.65	0.9	0.0999	0.0899	0.0899	29.4	0.0899	0.0899	29.4	29.4		46.5	633.5	0.055	1.92	0.05	2.1	3		1	2G,3.0X	26	20.6	AW1
AS7	GULLY TWIN	65602.37	278644.4	28.75	28.76	28.76																														-
AT1	SEP	65534.28	278827.3	37.6	37.6	37.6																		0					2.5	3		1	2G,1.5X	0		LOST
AT2	GULLY	65514.31	278802.33	36.21	36.21	36.21	1l	Direct				5	117.65	0.9	0.103	0.0927	0.0927	30.3	0.0927	0.0927	30.3	30.3		30.3	0.4	0.005	0.72	0.09	4.2	2.6		1	4G,1.5X	20.1	10.2	LOST
AW1	SEP	65615.78	278597.47	29.05	29.05	29.05	1l	Direct				5	117.65	0.9	0.0975	0.0878	32.9905	1032.9	0.0878	0.7521	245.8	1032.9		1053.5	337.9	0.15	5.81	0.4	0.6	3		1	0.5G,3.0X	105	948.5	LOST
							3P	Kinematic Wave	624.5	0.6	0.25	247.65	11.27	0.4	82.2567	32.9027			0.6643																	
AW2	GULLY	65639.59	278596.7	28.15	28.15	28.15																														-
AZ1	SEP TWIN	65485.95	278951.69	33.37	33.37	33.37	1l	Direct				5	117.65	0.9	0.1607	0.1447	0.1447	47.3	0.1447	0.1447	47.3	47.3		53.1	545.1	0.058	2.12	0.05	2	3		1	2G,3.0X	34.2	18.9	BD1
B1	SEP TWIN	65381.44	280449.66	36.37	36.37	36.37	1l	Direct				5	117.65	0.9	0.0753	0.0678	0.0678	22.2	0.0678	0.0678	22.2	22.2		22.2	6816.1	0.05	1.75	0.03	0.8	3		1	1G,1.5X	19.1	3.1	LOST
BB1	COMBO SEP	65408.88	280240.86	35.43	35.43	35.43	1l	Direct				5	117.65	0.9	0.1226	0.1103	0.1103	36	0.1103	0.1103	36	36		54.7	5809.6	0.069	2.42	0.05	0.9	3		0.61	1G,3.0X	21.5	33.2	.2
BB2	MH	65409.58	280242.28	35.69	35.69	35.69																														-
BC1	SEP	65422.38	280246.13	35.43	35.43	35.43	1l	Direct				5	117.65	0.9	0.0723	0.0651	0.0651	21.3	0.0651	0.0651	21.3	21.3		27.1	454.9	0.052	1.82	0.03	1	3		1	1G,3.0X	21.3	5.8	1
BC2	MH	65423.87	280247.73	35.44	35.44	35.44																														-
BD1	SEP	65489.42	279001.59	32.82	32.82	32.82	1l	Direct				5	117.65	0.9	0.0771	0.0694	0.0694	22.7	0.0694	0.0694	22.7	22.7		41.5	482.9	0.049	2.49	0.03	0.5	3		1	0.5G,3.0X	30.6	10.9	BE1
BE1	SEP	65492.15	279040.81	32.63	32.63	32.63	1l	Direct				5	117.65	0.9	0.0582	0.0524	0.0524	17.1	0.0524	0.0524	17.1	17.1		28	482.9	0.059	2.14	0.03	0.5	3		1	0.5G,3.0X	23.8	4.2	AQ1
BF1	GULLY	65490.55	279367.73	30.65	30.65	30.65	1l	Direct				5	117.65	0.9	0.1269	0.1142	0.1142	37.3	0.1142	0.1142	37.3	37.3		37.3										37.3		-
BF2	MH	65491.14	279359.76	30.6	31.86	31.2																														-
BG1	COMBO SEP TWIN	65511.88	279347.43	31.26	31.26	31.26	1l	Direct				5	117.65	0.9	0.089	0.0801	0.0801	26.2	0.0801	0.0801	26.2	26.2		28.2	35.3	0.042					0.047	1		28.2		-
C1	SEP TWIN	65367.05	280442.53	36.4	36.4	36.4	1l	Direct				5	117.65	0.9	0.1055	0.0949	0.0949	31	0.0949	0.0949	31	31		31	5675.7	0.056	1.97	0.03	0.8	3		1	1G,3.0X	27.6	3.4	LOST
Ex J1	MH	65368.75	280447.07	36.77	36.57	36.57																														-
D1	GULLY	65347.56	280369.4	37.08	37.08	37.08	1l	Direct				5	117.65	0.9	0.04	0.036	0.036	11.8	0.036	0.036	11.8	11.8		11.8	238.5	0.021	2.96	0.01	1.3	1		1	1G,0.5X	6.7	5.1	LOST
D2	MH	65353.57	280366.23	37.08	37.08	37.08																														-
E1	SEP	65393.2	280341.26	36.39	36.39	36.39	1l	Direct				5	117.65	0.9	0.0723	0.065	0.065	21.3	0.065	0.065	21.3	21.3		21.3	390.5	0.049	1.72	0.02	0.7	3		1	0.5G,3.0X	19.8	1.5	H1
Ex Ak3	MH	65380.84	280338.34	36.77	36.77	36.77																														-
F1	COMBO SEP	65379.58	280335.58	36.28	36.28	36.28	1l	Direct				5	117.65	0.9	0.1301	0.1171	0.1171	38.3	0.1171	0.1171	38.3	38.3		38.3	2975.7	0.051	2.12	0.04	0.9	3.5		1	1G,3.0X	27	11.3	G1
G1	SEP	65391.73	280289.01	35.87	35.87	35.87	1l	Direct				5	117.65	0.9	0.125	0.1125	0.1125	36.8	0.1125	0.1125	36.8	36.8		48.1	2995.4	0.066	2.31	0.04	0.9	3.5		1	1G,3.0X	29.4	18.6	BB1
G2	MH	65391.42	280290.03	35.87	35.87	35.87																														-
H1	SEP	65405.51	280293.54	35.92	35.92	35.92	1l	Direct				5	117.65	0.9	0.0677	0.0609	0.0609	19.9	0.0609	0.0609	19.9	19.9		21.4	447.4	0.047	1.67	0.03	1	3		1	1G,1.5X	15.6	5.8	BC1
I1	SEP	65443.4	280192.46	34.88	34.88	34.88	1l	Direct				5	117.65	0.9	0.1318	0.1186	0.1186	38.8	0.1186	0.1186	38.8	38.8		44.6	454.9	0.063	2.2	0.04	1	3		1	1G,3.0X	28.4	16.2	K1
J1	COMBO SEP	65436.92	280169.22	34.77	34.77	34.77	1l	Direct				5	117.65	0.9	0.0455	0.041	0.041	13.4	0.041	0.041	13.4	13.4		22.7	2797.2	0.045	2.07	0.02	0.9	2.2		1	1G,1.5X	15.1	7.6	LOST
J2	GULLY	65429.8	280187.43	34.94	34.94	34.94																		33.2	2584.7	0.057	2.01	0.03	0.9	3		1	1G,3.0X	23.9	9.3	J1
K1	SEP	65461.39	280146.51	34.41	34.41	34.41	1l	Direct				5	117.65	0.9	0.0514	0.0462	0.0462	15.1	0.0462	0.0462	15.1	15.1		31.3	1672.8	0.055	1.92	0.03	1	3		1	1G,3.0X	23.5	7.8	M1
K2	MH	65449.14	280141.65	34.71	34.71	34.71																														-
K3	COMBO SEP	65440.01	280138.03	34.39	34.39	34.39	1l	Direct				5	117.65	0.9	0.0731	0.0658	0.0658	21.5	0.0658	0.0658	21.5	21.5		21.5	2285	0.028	2.99	0.01	1.9	0.9		1	2G,0.5X	10.5	11.1	M2
L1	GULLY	65455.38	280128	34.44	34.44	34.44	1l	Direct				5	117.65	0.9	0.029	0.0261	0.0261	8.5	0.0261	0.0261	8.5	8.5		8.5	114	0.028	1.5	0.01	1.1	2		1	1G,1.5X	6.8	1.7	LOST
M1	COMBO SEP TWIN	65484.27	280088.05	33.91	33.91	33.91	1l	Direct				5	117.65	0.9	0.1212	0.1091	0.1091	35.6	0.1091	0.1091	35.6	35.6		43.4	70.7	0.053					0.071	1		43.4		LOST
M2	COMBO SEP TWIN	65458.92	280080.13	33.71	33.71	33.71																		28.8	1540.7	0.076	2.74	0.02	0.1	3		1	0.5G,3.0X	28.8		LOST
M3	MH	65454.96	280079.02	33.71	33.71	33.97																														-
N1	HW	65521.81	279075.98	31	31.86	31.86																		0										0		-
N2	HW outlet	65522.52	279088.07	30.93	31.79	31.79																														-
O1	SEP	65498.65	280051.33	34.22	34.22	34.22	1l	Direct				5	117.65	0.9	0.0849	0.0764	0.0764	25	0.0764	0.0764	25	25		25	723.6	0.042	1.67	0.03	2	2.6		1	2G,1.5X	15.5	9.5	LOST
R1	SEP	65515.67	279984.54	35.96	35.96	35.96	1l	Direct				5	117.65	0.9	0.0514	0.0462	0.0462	15.1	0.0462	0.0462	15.1	15.1		18.9	1018.1	0.034	1.74	0.02	2.1	2		1	2G,1.5X	13.6	5.4	LOST
R2	SEP	65494.91	279997.78	35.24	35.24	35.24	1l	Direct				5	117.65	0.9	0.1085	0.0976	0.0976	31.9	0.0976	0.0976	31.9	31.9		42.5	1079.4	0.051	1.85	0.05	2.4	3		1	2G,3.0X	24.7	17.7	M2
Q1	SEP	65530.46	279942.86	36.72	36.72	36.72	1l	Direct				5	117.65	0.9	0.0749	0.0674	0.0674	22	0.0674	0.0674	22	22		22	500.9	0.046	1.6	0.03	1.2	3		1	1G,3.0X	18.2	3.8	R1
Q2	SEP	65516.35	279938.44	36.43	36.43	36.43	1l	Direct				5	117.65	0.9	0.0995	0.0896	0.0896	29.3	0.0896	0.0896	29.3	29.3		29.3	765.8	0.05	1.83	0.03	1.2	3		1	1G,1.5X	18.7	10.6	R2
Q3	MH	65491.73	279996.69	35.23	35.23	35.4																														-
Q5	MH	65469.14	279984.94	35.28	35.28	33																														-

CAUTION
SERVICES SHOWN ARE TO BE USED AS A GUIDE ONLY. SERVICES SHALL BE MANUALLY LOCATED BY HAND PRIOR TO MECHANICAL EXCAVATION. RELEVANT PERMITS SHALL BE OBTAINED PRIOR TO SITE WORKS AND A DBYD ENQUIRY SHALL BE UNDERTAKEN NO EARLIER THAN 30 DAYS BEFORE CONSTRUCTION. A FULL SET OF THE DBYD DOCUMENTS ARE TO BE KEPT ON SITE AT ALL TIMES. CONFLICTING SERVICES ARE TO BE RELOCATED/PROTECTED TO THE SATISFACTION OF THE SERVICE AUTHORITY PRIOR TO WORKS.

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REV	DATE	BY	DESCRIPTION
0	04.23	DW	ISSUED FOR CONSTRUCTION

AMENDMENTS

AUTHORISATION

PROJECT MANAGER — DATE

DESIGNED D.WEERTS — CHECKED — DATE

APPROVED

DESIGN CO-ORDINATOR — DATE

DRAWN C.CAYATTE

SCALE: (A1)

DATUM: A.H.D.

HENLEY BROOK AVE - STAGE 3

MESSARA AVENUE TO PARK STREET

DUAL CARRIAGEWAY

DRAINAGE HYDROLOGY Q10

PROFORMCIVIL ENGINEERING GROUP www.proformcivil.com

city of swan

DRAWING No: R771-127

REV No: 0

OPERATIONS

HYDRAULICS Q100 (1% AEP)

Pipe ID (-)	Pipe Type (-)	Pipe Length (m)	Pipe Size (mm)	Full Pipe Area Af (sq.m)	Pipe Grade (%)	Pipe Grade (1 in)	Full-area Tct (min)	Full-area I (mm/hr)	Full-area Sum CA (ha)	Full-area Qc=CIA (L/s)	Part-area Tct (min)	Part-area I (mm/hr)	Part-area Sum CA (ha)	Part-area Qc=CIA (L/s)	Direct Node Flow Qdg (L/s)	Peak Flow Qrat (L/s)	Net Bypass Flow Qb (L/s)	Pipe Flow Q (L/s)	Excess Pipe Flow Qx (L/s)	Capacity Flow Qcap (L/s)	Q/Qcap Ratio (-)	Full Pipe Vel Vf=Q/Af (m/s)	Norm Depth Vel Vn=Q/An (m/s)	Crit Depth Vel Vc=Q/Ac (m/s)	Capacity Vel Vcap=Qcap/Af (m/s)	US Node Grate RL (m)	Pipe US IL (m)	Pipe DS IL (m)	DS Node Grate RL (m)	Cover Limit (m)	Cover Min (m)	Pipe DS Bend (deg)	Pipe DS Drop (m)	US Node Ku (-)	US Node Kw (-)	Pipe V'head (m)	P'head Loss (Ku.V'head) (m)	WSE Loss (Kw.V'head) (m)	Pipe T'head Loss (m)	US Node HGL (m)	Pipe US HGL (m)	Pipe DS HGL (m)	DS Node HGL (m)	HGL Grade (%)	HGL Grade (1 in)	F'board Limit (m)	F'board US (m)
AB1 to AB2	RCP 4	6.67	450	0.159	1.9	52.6	253.93	17.82	7.7083	381.5	5	214.27	0.2517	149.8		381.5		381.5	378.6	393.5	0.97	2.4	93.43	62.96	2.47	31.63	30.62	30.49	31.66	0	-0.11	9.9	0	1.5		0	0		0	31.63	31.63	31.63	31.63	0	915615.5	0.3	0
AB2 to AB3	RCP 4	26.62	450	0.159	0.79	126.1	253.99	17.82	7.8805	390	24	89.36	0.9915	246.1		390	-18.9	371.1	365.3	254	1.46	2.33	2.33	2.43	1.6	31.66	30.49	30.28	32.37	0.7	0.35	26.4	0.9	0.85	0.94	0	0	0	0	31.63	31.63	31.63	31.63	0	241953.1	0.3	0.03
AB3 to AB4	RCP 4	6.72	450	0.159	0.51	197.4	254.21	17.81	7.8805	389.8	24.23	88.82	0.9915	244.6		389.8	-18.9	370.9	354.9	203	1.83	2.33	2.33	2.43	1.28	32.37	29.38	29.34	32.39	0.7	2.5	0.5	-0.934	1.52	1.92	0	0	0	0	31.63	31.63	31.63	31.63	0	32033.7	0.3	0.74
AB4 to AB5	RCP 4	56.97	450	0.159	1	100	254.27	17.8	7.8805	389.7	24.28	88.69	0.9915	244.3		389.7	-18.9	370.8	47.3	285.2	1.3	2.33	2.33	2.43	1.79	32.39	30.28	29.71	31.54	0.7	0.36	0		0.22	0.23	0.21	0.05	0.05	0.73	31.63	31.58	30.85	30.85	1.29	77.7	0.3	0.76
AD1 to AD2	RCP 4	12.97	300	0.071	1	100	5	214.27	0.0623	37.1	5	214.27	0.0523	37.1		37.1		37.1		96.7	0.38	0.52	1.28	1.07	1.37	31.78	30.77	30.64	31.84	0.7	0.7	94.7	0.065	3.58		0.01	0.05		0.02	31.73	31.68	31.66	31.66	0.15	681.3	0.3	0.05
AD2 to S9	RCP 4	54.63	375	0.11	0.62	162.3	5.11	212.49	0.111	65.5	5	214.27	0.1097	65.3		65.5		65.5		137.7	0.48	0.59	1.23	1.2	1.25	31.84	30.57	30.24	32.45	0.7	0.74	-94.8	0	1.9	2.09	0.02	0.03	0.04	0.08	31.66	31.62	31.55	31.56	0.14	716.6	0.3	0.17
AF1 to S10	RCP 4	23.33	300	0.071	1	100										0		0		96.7	0	0	0	0	1.37	31.35	30.34	30.1	31.41	0.7	0.7	-94.2	0.211			0			0	31.3	31.3	31.3	31.31	0	1000000	0.3	0.05
AG1 to S11	RCP 4	25.71	300	0.071	1	100										0		0		96.7	0	0	0	0	1.37	31.24	30.21	29.95	31.32	0.7	0.7	-1.1	0.202			0			0	31.21	31.21	31.21	31.24	0	1000000	0.3	0.02
AH1 to AH2	RCB	66.01	(3x)x600	2.16	0.3	330									1440	1440		1440		3127.9	0.46	0.67	1.41	1.58	1.45	33	29.88	29.68	31.2	1.1	-0.52	0		1		0.02	0.02		0.04	31.05	31.02	30.98	30.98	0.06	1557.2	0.3	1.95
AI1 to AO11	RCP 4	20.79	375	0.11	1	100	5	214.27	0.0509	30.3	5	214.27	0.0509	30.3		30.3	3.2	33.5		175.4	0.19	0.3	1.22	0.97	1.59	31.85	30.75	30.54	31.85	0.7	0.7	-90.6	0.065	1		0	0		0.14	31.13	31.12	30.98	30.98	0.69	145.4	0.3	0.73
AJ1 to AO14	RCP 4	20.08	300	0.071	1	100	5	214.27	0.0524	31.2	5	214.27	0.0524	31.2		31.2	-5.5	25.7		96.7	0.27	0.36	1.16	0.95	1.37	31.3	30.28	30.08	31.27	0.7	0.7	-90.2	0.165	4.9		0.01	0.03		0.01	31.03	30.99	30.98	30.98	0.07	1415.7	0.3	0.28
AK1 to AO13	RCP 4	20.77	375	0.11	1	100	5	214.27	0.0496	29.5	5	214.27	0.0496	29.5		29.5	2.4	31.9		175.4	0.18	0.29	1.21	0.96	1.59	31.47	30.36	30.16	31.46	0.7	0.7	-90.2	0.065	8.32		0	0.04		0.01	31.02	30.99	30.98	30.98	0.03	3015.7	0.3	0.45
AL1 to AO12	RCP 4	20.72	375	0.11	1	100	5	214.27	0.0505	30	5	214.27	0.0505	30		30	2.7	32.7		175.4	0.19	0.3	1.22	0.96	1.59	31.66	30.56	30.35	31.66	0.7	0.7	-90.1	0.065	7		0	0.04		0.01	31.03	30.99	30.98	30.98	0.03	2877.5	0.3	0.63
AM1 to AM2	RCP 4	35.11	(2x)375	0.221	0.56	179.7	229.3	19.1	8.7373	444.2	229.3	19.1	8.7373	444.2		444.2		444.2		261.7	1.7	2.01	2.01	2.12	1.18	31.14	30.37	30.17	30.95	0.7	0.76	0		1		0.21	0.21		0.21	30.95	30.74	30.51	30.51	0.67	150.3	0.3	0.19
AN1 to AO10	RCP 4	20.82	375	0.11	1	100	5	214.27	0.0511	30.4	5	214.27	0.0511	30.4		30.4	4.1	34.6		175.4	0.2	0.31	1.23	0.98	1.59	32.05	30.94	30.73	32.04	0.7	0.7	-89.9	1.315	9.7		0	0.05		0.33	31.36	31.32	30.98	30.98	1.61	62	0.3	0.68
AO1 to AO2	RCP 4	25.34	375	0.11	1.02	98.3	24	89.36	13.3797	3321.2	5	214.27	2.8112	1673.2		3321.2	-3262	59.2		176.9	0.33	0.54	1.44	1.16	1.6	35.83	35.11	34.86	36.03	0.7	-0.01	3.9	0.05	9.7		0.01	0.14		0.3	35.63	35.49	35.19	35.19	1.19	83.9	0.3	0.2
AO2 to AO3	RCP 4	20.29	375	0.11	1	100	24.21	88.85	13.44	3317	5.21	210.8	2.8715	1681.5		3317	-3282.9	34.1		175.4	0.19	0.31	1.23	0.98	1.59	36.03	34.81	34.6	35.87	0.7	0.75	-39.4	0.035	1.21	1.29	0	0.01	0.01	0.23	35.19	35.18	34.95	34.95	1.16	86.5	0.3	0.84
AO3 to AO4	RCP 4	76.27	375	0.11	2.62	38.2	24.38	88.44	13.4696	3309.1	5.38	208.09	2.901	1676.9		3309.1	-3289.1	20		283.8	0.07	0.18	1.48	0.84	2.57	35.87	34.57	32.57	33.78	0.7	0.71	40.3	0.271	1.91	2.33	0	0		2.19	34.95	34.94	32.64	32.3	3.02	33.1	0.3	0.92
AO4 to AO5	RCP 4	17.61	375	0.11	1	100	25.02	86.95	13.6142	3288.4	6.02	198.38	3.0457	1678.3		3288.4	-3334.7	0		175.4	0	0	0	0	1.59	33.78	32.3	32.13	33.16	0.7	0.63	-38.5	0.091			0			0.18	32.3	32.3	32.13	32.03	1	100	0.3	1.48
AO5 to AO6	RCP 4	35.97	375	0.11	1	100	25.17	86.62	13.7412	3306.3	6.16	196.25	3.1727	1729.5		3306.3	-3376.9	0		175.4	0	0	0	0	1.59	33.16	32.03	31.68	32.81	0.7	0.81	1.4	0.04			0			0.36	32.03	32.03	31.68	31.64	1	100	0.3	1.13
AO6 to AO7	RCP 4	39.25	450	0.159	1	100	25.47	85.94	13.8556	3307.8	6.46	192.03	3.2871	1753.4		3307.8	-3371.8	0		285.2	0	0	0	0	1.79	32.81	31.64	31.24	32.62	0.7	0.83	0	0.02			0			0.39	31.64	31.64	31.24	31.22	1	100	0.3	1.17
AO7 to AO8	RCP 4	33.32	450	0.159	1	100	25.79	85.22	13.9561	3303.8	6.79	187.61	3.3876	1765.4		3303.8	-3361	0		285.2	0	0	0	0	1.79	32.62	31.22	30.89	32.46	0.7	0.93	0	0.02			0			0.24	31.22	31.22	30.98	30.98	0.73	137.4	0.3	1.4
AO8 to AO9	RCP 4	46.68	525	0.216	0.4	250	26.07	84.62	14.0508	3302.7	7.07	184.02	3.4823	1780		3302.7	-3349.6	0		272.1	0	0	0	0	1.26	32.46	30.87	30.68	32.23	0.7	0.96	-0.1	0.02			0			0	30.98	30.98	30.98	30.98	0	1000000	0.3	1.48
AO9 to AO10	RCP 4	40	525	0.216	0.4	250	26.46	83.79	14.1433	3291.9	7.46	179.22	3.5748	1779.6		3291.9	-3340.4	0		272.1	0	0	0	0	1.26	32.23	30.66	30.5	32.04	0.7	1.11	0.1	1.085			0			0	30.98	30.98	30.98	30.98	0	1000000	0.3	1.25
AO10 to AO11	RCP 4	40	525	0.216	0.4	250	26.79	83.1	14.2367	3286.2	7.79	175.3	3.6681	1786.2		3286.2	-3334.1	0		272.1	0	0	0	0	1.26	32.04	29.42	29.26	31.85	0.7	2.16	0	-1.217			0			0	30.98	30.98	30.98	30.98	0	1000000	0.3	1.06
AO11 to AO12	RCP 4	40	525	0.216	0.4	250	27.13	82.42	14.3295	3280.6	8.12	171.56	3.761	1792.3		3280.6	-3329.2	0		272.1	0	0	0	0	1.26	31.85	30.48	30.32	31.66	0.7	0.91	0.1	0.03			0			0	30.98	30.98	30.98	30.98	0	1000000	0.3	0.87
AO12 to AO13	RCP 4	40	600	0.283	0.4	250	27.46	81.75	14.421	3274.8	8.46	167.99	3.8525	1797.7		3274.8	-3325.1	0		388.5	0	0	0	0	1.37	31.66	30.29	30.13	31.46	0.7	0.84	-0.1	0.034			0			0	30.98	30.98	30.98	30.98	0	1000000	0.3	0.68
AO13 to AO14	RCP 4	40	600	0.283	0.4	250	27.79	81.1	14.5083	3268.3	8.79	164.57	3.9398	1801		3268.3	-3320.3	0		388.5	0	0	0	0	1.37	31.46	30.09	29.93	31.27	0.7	0.84	-0.2	0.02			0			0	30.98	30.98	30.98	30.98	0	1000000	0.3	0.48
AO14 to AO15	RCP 4	34.75	600	0.283	0.4	250	28.13	80.46	14.5997	3262.9	9.12	161.3	4.0312	1806.2		3262.9	-3324.8	0		388.5	0	0	0	0	1.37	31.27	29.91	29.77	31.2	0.7	0.85	58.2	0.045			0			0	30.98	30.98	30.98	30.98	0	1000000	0.3	0.29
AO15 to AO16	RCP 4	5.53	600	0.283	0.4	250	28.42	79.91	14.7529	3274.6	9.41	158.57	4.1844	1843.1		3274.6	-3268.2	6.4		388.5	0.02	0.02	0.51	0.58	1.37	31.2	29.73	29.71	31.2	0	0.2	0		1.6	1.78	0	0	0	0	30.98	30.98	30.98	30.98	0	912731.3	0.3	0.22
AP1 to AO9	RCP 4	20.82	375	0.11	1.24	80.6	5	214.27	0.0511	30.4	5	214.27	0.0511	30.4		30.4	5.4	35.9		195.3	0.18	0.32	1.35	0.99	1.77	32.24	31.19	30.93	32.23	0.7	0.65	-89.7	0.265	9.7		0.01	0.05		0.44	31.61	31.56	31.04	30.98	2.52	39.7	0.3	0.63
AQ1 to AO8	RCP 4	20.85	375	0.11	1.24	80.7	5	214.27	0.0515	30.7	5	214.27	0.0515	30.7		30.7	6.9	37.6		195.3	0.19	0.34	1.37	1.01	1.77	32.47	31.41	31.15	32.46	0.7	0.65	-90.1	0.281	9.7		0.01	0.06		0.43	31.84	31.78	31.26	30.98	2.5	39.9	0.3	0.62
AR1 to AO3	RCP 4	12.88	300	0.071	3.41	29.3	5	214.27	0.0159	9.5	5	214.27	0.0159	9.5		9.5	-3.3	6.1		178.7	0.03	0.09	1.18	0.63	2.53	36.37	35.31	34.87	35.87	0.7	0.69	11.8	0.304	7		0	0		0.66	35.62	35.61	34.95	34.95	5.16	19.4	0.3	0.75
AS1 to AS2	RCP 4	46.53	300	0.071	1	100	5	214.27	0.0585	34.8	5	214.27	0.0585	34.8		34.8		34.8		96.7	0.36	0.49	1.26	1.04	1.37	35.57	34.57	34.1	35.36	0.7	0.7	30.5	0.035	9.7		0.01	0.12		0.39	34.99	34.87	34.47	34.5	0.85	118.2	0.3	0.59
AS2 to AS3	RCP 4	49.13	300	0.071	3.35	29.9	5.39	207.97	0.2101	121.4	5.15	211.87	0.2073	122		122	-48.5	73.4		177	0.41	1.04	2.39	1.38	2.5	35.36	34.07	32.42	33.44	0.7	0.72	-12.3	0.067	1.93	2.44	0.06	0.11	0.13	1.59	34.5	34.37	32.78	32.8	3.24	30.9	0.3	0.86
AS3 to AS4	RCP 4	54.8	300	0.071	3.61	27.7	5.8	201.63	0.2838	159	5.55	205.34	0.281	160.3		160.3	-71.4	88.9		183.9	0.48	1.26	2.58	1.51	2.6	33.44	32.36	30.37	31.44	0.7	0.7	-42.4	0.061	1.5	1.76	0.08	0.12	0.14	1.68	32.8	32.66	30.98	31	3.07	32.6	0.3	0.64
AS4 to AS5	RCP 4	15.21	300	0.071	1	100	6.25	194.95	0.3577	193.7	6.01	198.44	0.3549	195.6		195.6	-93.1	102.5		96.7	1.06	1.45	1.54	1.64	1.37	31.44	30.31	30.16	31.3	0.7	0.7	40.8	0.04	1.71	1.91	0.11	0.18	0.21	0.17	31	30.79	30.62	30.65	1.12	89.1	0.3	0.44
AS5 to AS6	RCP 4	48.62	300	0.071	2.6	38.4	6.38	193.16	0.3577	191.9	6.14	196.6	0.3549	193.8		193.8	-93.1	100.7		156.1	0.65	1.42	2.35	1.62	2.21	31.3	30.12	28.86	29.81	0.7	0.72	-53	0.045	1.93	2.16	0.1	0.2	0.22	0.75	30.65	30.42	29.67	29.69	1.54	64.9	0.3	0.65
AS6 to AS7	RCP 4	22.51	300	0.071	3.07	32.6	6.79	187.66	0.4476	233.3	6.4	192.92	0.4404	236		236	-114.2	121.8		169.4	0.72	1.72	2.61	1.84	2.4	29.81	28.81	28.12	28.76	0.7	0.3	0		1.69	1.82	0.15	0.26	0.28	0.36	29.69	29.42	29.06	29.06	1.58	63.1	0.3	0.12
AT1 to AT2	RCP 4	31.26	300	0.071	6.08	16.4										0		0		238.6	0	0	0	0	3.38	37.6	37.01	35.11	36.21	0.7	0.43	5.5	0.118			0			1.66	37.01	37.01	35.35	35.35	5.32	18.8	0.3	0.59
AT2 to AS2	RCP 4	17.47	300	0.071	4.21	23.8	5	214.27	0.0927	55.2	5	214.27	0.0927	55.2		55.2	-31.1	24.1		198.5	0.12	0.34	1.9	0.93	2.81	36.21	34.99	34.26	35.36	0.7	0.75	-60.9	0.188	9.7		0.01	0.06		0.81	35.35	35.29	34.47	34.5	4.68	21.4	0.3	0.86
AW1 to AW2	RCP 4	23.48	300	0.071	2.1	47.7	190.72	21.66	37.1033	2232.1	5	214.27	1.0582	629.8		2232.1	-2148.1	84		140.1	0.6	1.19	2.07	1.47	1.98	29.05	27.97	27.48	28.15	0.7	0.7	0		3.44		0.07	0.25		0.18	28.97	28.72	28.54	28.54	0.75	132.6	0.3	0.08
AZ1 to AO4	RCP 4	10.63	300	0.071	1	100	5	214.27	0.1447	86.1	5	214.27	0.1447	85.1		86.1	-45.6	40.5		96.7	0.42	0.57	1.31	1.1	1.37	33.37	32.45	32.35	33.78	0.6	0.6	-52.8	0.045	9.52		0.02	0.15		0.2	32.91	32.75	32.48	32.3	2.55	39.3	0.3	0.45
B1 to Ex J1	RCP 4	13.41	300	0.071	1	100	5	214.27	0.0678	40.3	5	214.27	0.0678	40.3		40.3	-18.6	21.7		96.7	0.22	0.31	1.1	0.9	1.37	36.37	35.34	35.21	36.57	0.7	0.7	99.5	0.065	9.7		0	0.05		0.03	35.69	35.64	35.62	35.64	0.22	456.2	0.3	0.68
BD1 to AO6	RCP 4	20.65	375	0.11	1	100	5	214.27	0.0694	41.3	5	214.27	0.0694	41.3		41.3	-0.6	40.7		175.4	0.23	0.37	1.29	1.03	1.59	32.82	31.76	31.56	32.81	0.7	0.65	-90	-0.077	9.7		0.01	0.07		0.38	32.21	32.14	31.68	31.64	2.22	45	0.3	0.61
BE1 to AO7	RCP 4	20.75	300	0.071	1	100	5	214.27	0.0524	31.2	5	214.27	0.0524	31.2		31.2	7.8	38.9		96.7	0.4	0.55	1.29	1.08	1.37	32.63	31.6	31.39	32.62	0.7	0.7	-90.2	0.171	9.7		0.02	0.15		0.31	32.05	31.9	31.53	31.22	1.81	55.3	0.3	0.57
BF1 to BF2	HDPE SN8	8	300	0.071	1.25	80	5	214.27	0.1142	68	5	214.27	0.1142	68		68		68		108.2	0.63	0.96	1.62	1.33	1.53	30.65	29.92	29.82	31.86	1.1	0.45	0		1.5		0.05	0.07		0.14	30.29	30.22	30	30	2.85	35.1	0.3	0.36
BG1 to AO15	RCP 4	23.51	375	0.11	1	100	5	214.27	0.0801	47.7	5	214.27	0.0801	47.7		47.7	40	87.6		175.4	0.5	0.79	1.59	1.32	1.59	31.26	30.2	29.96	31.2	0.7	0.65	-13.5	0.237	4.61		0.03	0.15		0.06	31.19	31.04	30.98	30.98	0.25	400.5	0.3	0.07
C1 to Ex J1	RCP 4	4.71	300	0.071	1	100	5	214.27	0.0949	56.5	5	214.27	0.0949	56.5		56.5	-24	32.5		96.7	0.34	0.46	1.23	1.02	1.37	36.4	35.51	35.47	36.57	0.7	0.7	-17.2	0.32	9.7		0.01	0.1		0.16	35.92	35.81	35.62	35.64	4.18	23.9	0.3	0.48
D1 to D2	RCP 4	6.91	300	0.071	1	100	5	214.27	0.036	21.4	5	214.27	0.036	21.4		21.4	-13.1	8.3		96.7	0.09	0.12	0.84	0.69	1.37	37.08	36.04	35.97	37.08	0.7	0.7	0		9.7		0	0.01		0.27	36.35	36.34	36.03	36.03	4.48	22.3	0.3	0.73
E1 to Ex Ak3	RCP 4	12.85	300	0.071	0.78	128.5	5	214.27	0.065	38.7	5	214.27	0.065	38.7		38.7	-15.2	23.5		85.3	0.28	0.33	1.03	0.92	1.21	36.39	35.5	35.4	36.77	0.7	0.57	115.2	0.155	9.7		0.01	0.05		0.08	35.85	35.8	35.72	35.74	0.6	166.4	0.3	0.53
F1 to Ex Ak3	RCP 4	3.03	300	0.071	1	100	5	214.27	0.1171	69.7	5	214.27	0.1171	69.7		69.7	-35.4	34.3		96.7	0.35	0.48	1.25	1.04	1.37	36.28	35.4	35.37	36.77	0.7	0.7	-12.7	0.125	9.7		0.01	0.12		0	35.84	35.73	35.72	35.74	0.13	796.6	0.3	0.43
H1 to G1	RCP 4	14.65	300	0.071	1	100	5	214.27	0.0609	36.2	5	214.27	0.0609	36.2		36.2	-16	20.2		96.7	0.21	0.29	1.08	0.88	1.37	35.92	34.9	34.75	35.87	0.7	0.7	124	0.08	9.7		0	0.04		0.01	35.26	35.21	35.21	35.25	0.04	2285.8	0.3	0.67
I1 to J2	RCP 4	15.37	300	0.071	1	100	5	214.27	0.1186	70.6	5	214.27	0.1186	70.6		70.6	-34.3	36.3		96.7	0.38	0.51	1.27	1.06	1.37	34.88	33.85	33.7	34.94	0.7	0.7	147.1	0.198	9.7		0.01	0.13		0.08	34.28	34.15	34.07	34.12	0.52	192	0.3	0.6
J1 to J2	RCP 4	19.55	300	0.071	1	100	5	214.27	0.041	24.4	5	214.27	0.041	24.4		24.4	7.2	31.6		96.7	0.33	0.45	1.22	1.01	1.37	34.77	33.74	33.55	34.94	0.7	0.7	59.4	0.045	7		0.01	0.07		0.02	34.17	34.09	34.07	34.12	0.11	936.7	0.3	0.6
J2 to igrorez	RCP 4	1.08	300	0.071	1	100	5.16	211.59	0.1595	93.8	5.13	212.16	0.1593	93.9		93.9	20.7	114.5		96.7	1.18	1.62	1.62	1.76	1.37	34.94	33.5	33.49	34.94	0.7	1.11	0	0	2.03	2.36	0.13	0.27	0.32	0.03	34.12	33.8	33.75	33.75	4.74	21.1	0.3	0.82
K1 to K2	RCP 4	13.55	300	0.071	1	100	5	214.27	0.0462	27.5	5	214.27	0.0462	27.5		27.5	7.4	34.9		96.7	0.36	0.49	1.26	1.04	1.37	34.41	33.41	33.27	34.71	0.7	0.67	0	0	9.7		0.01	0.12		0.11	33.83	33.71	33.6	33.61	0.8	125.2	0.3	0.58
K2 to K3	RCP 4	9.83	300	0.071	1	100	5.13	212.19	0.0723	42.6	5.11	212.41	0.0723	42.6		42.6	0.9	43.5		96.7	0.45	0.62	1.33	1.13	1.37	34.71	33.27	33.18	34.39	0.7	0.89	-0.7	0	1.41	1.69	0.02	0.03	0.03	0.06	33.61	33.57	33.51	33.51	0.62	161.2	0.3	1.11
K3 to Ex A01	RCP 4	1.97	300	0.071	1	100	5.21	210.86	0.1381	80.9	5.19	211.07	0.1381	81		81	-25.7	55.3		96.8	0.57	0.78	1.41	1.23	1.37	34.39	33.18	33.16	34.53	0.7	0.99	0		1.2	1.21	0.03	0.04	0.04	0.08	33.51	33.48	33.37	33.37	5.38	18.6	0.3	0.88
L1 to K2	RCP 4	15.1	300	0.071	0.4	250.2	5	214.27	0.0261	15.5	5	214.27	0.0261	15.5		15.5	-6.5	9.1		61.2	0.15	0.13	0.62	0.7	0.87	34.44	33.45	33.39	34.71	0.7	0.67	-84.9	0.119	7		0	0.01		0.15	33.76	33.75	33.6	33.61	1.01	99.4	0.3	0.68
M1 to M2	RCP 4	27.04	300	0.071	1	100	5	214.27	0.1091	64.9	5	214.27	0.1091	64.9		64.9	-29.6	35.3		96.7	0.37	0.5	1.26	1.05	1.37	33.91	32.88	32.61	33.71	0.7	0.7	1.8	0.02	8.82		0.01	0.11		0.04	33.38	33.26	33.23	33.23	0.13	749.9	0.3	0.53
M2 to M3	RCP 4	4.11	300	0.071	1	100	5.23	210.57	0.1091	63.8	5.23	210.57	0.1091	63.8		63.8	39	102.7		96.7	1.06	1.45	1.54	1.64	1.37	33.71	32.59	32.55	33.71	0.7	0.9	0	0.506	3.16	3.18	0.11	0.34	0.34	0.06	33.23	32.89	32.79	32.79	2.26	44.2	0.3	0.48
N1 to N2	HDPE SN8	12.12	450	0.159	0.58	173.8										0		0		216.4	0	0	0	0	1.36	31.86	31.01	30.94	31.79	0	0.12	0				0			0.07	31.01	31.01	30.94	30.94	0.58	173.8	0.3	0.85
O1 to Ex A03	RCP 4	26.43	300	0.071	1	100	5	214.27	0.0764	45.5	5	214.27	0.0764	45.5		45.5	-28.6	16.9		96.7	0.17	0.24	1.03	0.84	1.37	34.22	33.19	32.92	34.04	0.7	0.7	0	0.02	9.7		0	0.03		0.43	33.52	33.49	33.01	33.01	1.81	55.1	0.3	0.7
R1 to R2	RCP 4	24.55	300	0.071	3.48	28.7	5	214.27	0.0462	27.5	5	214.27	0.0462	27.5		27.5	-10.6	17		180.4	0.09	0.24	1.6	0.84	2.55	35.96	35.07	34.22	35.24	0.7	0.7	-51.5	0.045	9.7		0	0.03		0.15	35.4	35.37	35.23	35.23	0.6	165.7	0.3	0.56
R2 to Q3	RCP 4	3.12	300	0.071	1	100	5.2	210.91	0.1439	84.3	5	214.27	0.142	84.5		84.5	-39.7	44.8		96.7	0.46	0.63	1.34	1.14	1.37	35.24	34.17	34.14	35.23	0.7	0.84	-8.7	2.863	2.02	2.09	0.02	0.04	0.04	0.01	35.23	35.18	35.18	35.23	0.21	466.7	0.3	0.01
Q1 to Q2	RCP 4	14.37	300	0.071	2.96	33.8	5	214.27	0.0674	40.1	5	214.27	0.0674	40.1		40.1	-18.5	21.6		166.4	0.13	0.31	1.62	0.9	2.35	36.72	35.82	35.39	36.43	0.7	0.7	84.5	0.06	9.7		0	0.05		0.44	36.17	36.12	35.68	35.68	3.09	32.4	0.3	0.55
Q2 to Q3	RCP 4	63.23	300	0.071	1.51	66.1	5.12	212.29	0.157	92.6	5	214.27	0.1554	92.5		92.6	-51.3	41.3		119	0.35	0.58	1.53	1.11	1.68	36.43	35.33	34.38	35.23	0.7	0.7	-94.6	3.098	2.38	2.7	0.02	0.04	0.05	0.46	35.68	35.63	35.18	35.23	0.72	138.3	0.3	0.75
S1 to S2	RCP 4	14.62	300	0.071	2.91	34.4	5	214.27	0.0848	50.5	5	214.27	0.0848	50.5		50.5	-28.8	21.7		164.9	0.13	0.31	1.61	0.9	2.33	36.48	35.59	35.16	36.2	0.7	0.7	-86.3	0.06	9.7		0	0.05		0.44	35.93	35.89	35.44	35.45	3.03	33	0.3	0.54
S2 to S3	RCP 4	82.67	300	0.071	2.19	45.6	5.12	212.26	0.2134	125.8	5	214.27	0.2114	125.8		125.8	-84	41.8		143.3	0.29	0.59	1.76	1.11	2.03	36.2	35.1	33.29	34.2	0.7	0.7	1.4	0.145	2.35	2.69	0.02	0.04	0.05	1.86	35.45	35.4	33.54	33.55	2.26	44.3	0.3	0.75
S3 to S4	RCP 4	46.94	300	0.071	2.83	35.3	5.81	201.43	0.4013	224.5	5.69	203.28	0.3992	225.4		225.4	-152.6	72.8		162.8	0.45	1.03	2.24	1.37	2.3	34.2	33.14	31.82	32.88	0.7	0.72	0.5	0.258	1.69	2.01	0.05	0.09	0.11	0.98	33.55	33.44	32.47	32.47	2.08	48	0.3	0.65
S4 to S5	RCP 4	39.91	450	0.159	1.26	79.7	6.2	195.69	0.5398	293.4	6.08	197.44	0.5377	294.9		294.9	-160.2	134.7		319.6	0.42	0.85	1.92	1.44	2.01	32.88	31.56	31.06	32.38	0.7	0.81	-0.2	0	1.64	1.89	0.04	0.06	0.07	0.09	32.47	32.41	32.32	32.33	0.22	448.1	0.3	0.4
S5 to S6	RCP 4	40	450	0.159	0.75	133.2	6.53	191.04	0.65	344.9	5.89	200.3	0.6254	348		348	-160.9	187		247.1	0.76	1.18	1.71	1.63	1.55	32.38	31.06	30.76	32.08	0.7	0.91	0	0	1.13	1.26	0.07	0.08	0.09	0.17	32.33	32.24	32.06	32.07	0.43	232.6	0.3	0.05
S6 to S7	RCP 4	30	450	0.159	0.71	139.9	6.87	186.59	0.7616	394.7	6.22	195.43	0.7371	400.1		400.1	-191.1	209		241.1	0.87	1.31	1.71	1.72	1.52	32.08	30.76	30.54	31.86	0.7	0.92	0.1	0	0.73	0.83	0.09	0.06	0.07	0.16	32.07	32	31.84	31.85	0.54	186.3	0.3	0.01
S7 to S8	RCP 4	28.99	525	0.216	0.46	217.8	7.12	183.38	0.8547	435.4	6.31	194.19	0.8207	442.7		442.7	-176.2	266.5		291.5	0.91	1.23	1.53	1.74	1.35	31.86	30.54	30.41	31.67	0.7	0.7	3.3	0.02	1.03	1.15	0.08	0.08	0.09	0.11	31.85	31.76	31.65	31.66	0.38	260.6	0.3	0.01
S8 to S9	RCP 4	50.75	750	0.442	0.3	333.3	7.36	180.39	1.033	517.6	6.55	190.84	0.999	529.6		529.6	-60.3	469.3	132	610	0.77	1.06	1.52	1.84	1.38	31.67	30.39	30.24	32.45	-2	0.47	-5.8	0	1.78	2.04	0.03	0.05	0.06	0.05	31.66	31.6	31.55	31.56	0.09	1090.4	0.3	0.01
S9 to S10	RCP 4	76.24	750	0.442	0.3	333.3	7.78	175.38	1.144	557.3	6.97	185.24	1.11	571.2		571.2	-60.3	510.8		610	0.84	1.16	1.55	1.89	1.38	32.45	30.24	30.01	31.41	-2	0.66	7.7	0.115	1.24	1.45	0.07	0.08	0.1	0.16	31.56	31.46	31.3	31.31	0.21	475.3	0.1	0.89
S10 to S11	RCP 4	24.15	750	0.442	0.34	291.7	8.42	168.39	1.144	535.1	7.61	177.42	1.11	547.1		547.1	-60.3	486.7		652.1	0.75	1.1	1.62	1.86	1.48	31.41	29.89	29.81	31.32	0.7	0.7	83.9	0.06	0.69	0.77	0.06	0.04	0.05	0.05	31.31	31.26	31.21	31.24	0.19	523.6	0.1	0.1
S11 to S12	RCP 4	16.97	750	0.442	0.15	666.6	8.62	166.3	1.144	528.5	7.81	175.09	1.11	539.9		539.9	-60.3	479.5	38.6	431.4	1.11	1.09	1.09	1.85	0.98	31.32	29.75	29.72	30.89	0	0.87	0		2.03	2.49	0.05	0.1	0.13	0.03	31.24	31.11	31.09	31.09	0.16	638.1	0.1	0.08
U1 to S3	RCP 4	19.5	300	0.071	3.48	28.7	5	214.27	0.0778	46.3	5	214.27	0.0778	46.3		46.3	-31.5	14.8		180.6	0.08	0.21	1.54	0.81	2.55	34.85	33.86	33.18	34.2	0.7	0.7	-47.6	0.04	9.7		0	0.02		0.63	34.19	34.16	33.54	33.55	3.22	31.1	0.3	0.67
V1 to S4	RCP 4	23.35	300	0.071	1	100	5	214.27	0.072	42.8	5	214.27	0.072	42.8		42.8	-23.5	19.3		96.7	0.2	0.27	1.07	0.87	1.37	32.87	31.85	31.62	32.88	0.7	0.7	-89.6	0.06	6.33		0	0.02		0.01	32.5	32.47	32.47	32.47	0.04	2510.5	0.3	0.37
W1 to S5	RCP 4	23.5	300	0.071	1	100	5	214.27	0.0533	31.7	5	214.27	0.0533	31.7		31.7	-8.1	23.7		96.7	0.24	0.33	1.13	0.93	1.37	32.38	31.36	31.12	32.38	0.7	0.7	-90	0.065	3.46		0.01	0.02		0.01	32.35	32.33	32.32	32.33	0.06	1671.9	0.3	0.03
X1 to S6	RCP 4	26.36	300	0.071	1	100	5	214.27	0.0592	35.2	5	214.27	0.0592	35.2		35.2	-13.2	22		96.7	0.23	0.31	1.11	0.91	1.37	32.11	31.08	30.82	32.08	0.7	0.7	-89.9	0.06	3.38		0	0.02		0.01	32.1	32.08	32.06	32.07	0.05	1935.7	0.3	0.01
Y1 to S7	RCP 4	27.12	300	0.071	1	100	5	214.27	0.0503	29.9	5	214.27	0.0503	29.9		29.9	-0.9	29		96.7	0.3	0.41	1.2	0.98	1.37	31.9	30.87	30.6	31.86	0.7	0.7	-89.9	0.06	3.37		0.01	0.03		0.02	31.89	31.86	31.84	31.85	0.09	1115.4	0.3	0.01
Z1 to Z2	RCP 4	5.47	300	0.071	4.57	21.9										0		0		206.9	0	0	0	0	2.93	31.68	31.25	31	31.66	0.7	-0.27	5.6	0.286			0			0	31.66	31.66	31.66	31.66	0	1000000	0.3	0.03
Z2 to S8	RCP 4	23.75	300	0.071	0.5	200	5	214.27	0.1025	61	5	214.27	0.1025	61		61	45.8	106.8	95.7	68.4	1.56	1.51	1.51	1.68	0.97	31.66	30.71	30.6	31.67	0.7	0.63	-89.1	0.207	3.65		0	0		0	31.66	31.65	31.65	31.66	0.01	7656.4	0.3	0

CAUTION
SERVICES SHOWN ARE TO BE USED AS A GUIDE ONLY. SERVICES SHALL BE MANUALLY LOCATED BY HAND PRIOR TO MECHANICAL EXCAVATION. RELEVANT PERMITS SHALL BE OBTAINED PRIOR TO SITE WORKS AND A DBYD ENQUIRY SHALL BE UNDERTAKEN NO EARLIER THAN 30 DAYS BEFORE CONSTRUCTION. A FULL SET OF THE DBYD DOCUMENTS ARE TO BE KEPT ON SITE AT ALL TIMES. CONFLICTING SERVICES ARE TO BE RELOCATED/PROTECTED TO THE SATISFACTION OF THE SERVICE AUTHORITY PRIOR TO WORKS.

REV	DATE	BY	DESCRIPTION
0	04.23	DW	ISSUED FOR CONSTRUCTION

AMENDMENTS

AUTHORISATION — PROJECT MANAGER, DATE
APPROVED — DESIGN CO-ORDINATOR, DATE
DESIGNED D.WEERTS — CHECKED — DATE — DRAWN C.CAYATTE

SCALE: (A1)
DATUM: A.H.D.

HENLEY BROOK AVE - STAGE 3
MESSARA AVENUE TO PARK STREET
DUAL CARRIAGEWAY
DRAINAGE HYDRAULICS Q100

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DRAWING No: R771-128
REV No: 0

OPERATIONS

HYDROLOGY Q100 (1% AEP)

Node Name	Node Type	Setout Easting	Setout Northing	Setout RL	Grate RL	Cover RL	Catch ID	Tc Method	Catch Length	Catch Slope	Catch Retardance	Time Tc	Intensity I	Runoff C	Area A	Full CA	Full Sum CA	Full Qc=CIA	Partial CA	Partial Sum CA	Partial Qc=CIA	Catchment Flow Qc	Direct Flow Qdg	Approach Flow Qa	Road Capacity	Flooded Depth	Flooded Width	Flooded VelDep	Road Grade	Road Xfall	Max Pond Depth	Choke Factor	Inlet Curve Name	Inlet Flow Qg	Bypass Flow Qb	Bypass Node
(-)	(-)	(m)	(m)	(m)	(m)	(m)	(-)	(-)	(m)	(%)	(-)	(min)	(mm/hr)	(-)	(ha)	(ha)	(ha)	(L/s)	(ha)	(ha)	(L/s)	(L/s)	(L/s)	(L/s)	(L/s)	(m)	(m)	(sq.m/s)	(%)	(%)	(m)	(-)	(-)	(L/s)	(L/s)	(-)
A1	SEP	65368.86	280499.42	36.16	36.16	36.16																		0										0		-
A2	MH	65371.15	280502.61	36.16	36.06	36.06																														-
AB1	HW	65486.16	279492.43	30.62	31.63	31.63	11	Direct				5	214.27	0.9	0.1133	0.102	7.7083	381.5	0.102	0.2517	149.8	381.5		381.5										381.5		-
							3P	Kinematic Wave	790.59	0.5	0.25	253.93	17.82	0.45	16.9029	7.6063			0.1498																	
AB2	GULLY	65492.2	279489.75	31.66	31.66	31.66	11	Direct				5	214.27	0.9	0.068	0.0612	0.1722	42.7	0.0612	0.0843	50.2	50.2		50.2	244.8	0.066	0.93	0.07	2.1	301.1		0.8	2G,5.0X	31.3	18.9	LOST
							3P	Kinematic Wave	100	2.5	0.25	24	89.36	0.45	0.2466	0.111			0.0231																	
AB3	MH	65514.09	279474.46	32.37	32.37	32.37																														-
AB4	MH	65517.33	279468.57	32.39	32.39	32.39																														-
AB5	GULLY	65544.37	279418.43	31.54	31.54	30.55																														-
AD1	GULLY	65571.33	279487.82	31.78	31.78	31.78	11	Direct				5	214.27	0.9	0.0692	0.0623	0.0623	37.1	0.0623	0.0623	37.1	37.1		37.1	198.5	0.092					0.3	0.5		37.1		LOST
AD2	GULLY	65570.94	279473.87	31.84	31.84	31.84	11	Direct				5	214.27	0.9	0.0542	0.0487	0.0487	29	0.0487	0.0487	29	29		29	198.5	0.079					0.3	0.5		29		LOST
AF1	SEP	65537.14	279398.8	31.35	31.35	31.35																		0					0.8	2.6		0.8	1G,1.5X	0		AG1
AG1	SEP	65535.73	279378.53	31.24	31.24	31.24																		0					0.4	3		0.8	0.5G,3.0X	0		AO15
AH1	HW Triple	65472.95	279356.43	29.88	33	30.88																	1440	1440										1440		-
AH2	HW outlet Triple	65538.75	279361.72	29.68	31.2	30.68																														-
AI1	SEP	65502.9	279200.58	31.85	31.85	31.85	11	Direct				5	214.27	0.9	0.0566	0.0509	0.0509	30.3	0.0509	0.0509	30.3	30.3		73.1	482.9	0.085	3.07	0.05	0.5	3		0.8	0.5G,3.0X	33.5	39.5	AL1
AJ1	SEP	65512.36	279319.99	31.3	31.3	31.3	11	Direct				5	214.27	0.9	0.0583	0.0524	0.0524	31.2	0.0524	0.0524	31.2	31.2		65.7	476.7	0.086	3.13	0.04	0.4	3		0.8	0.5G,15X	25.7	40	BG1
AK1	SEP	65508.83	279280.22	31.47	31.47	31.47	11	Direct				5	214.27	0.9	0.0551	0.0496	0.0496	29.5	0.0496	0.0496	29.5	29.5		66.4	498	0.082	2.96	0.04	0.5	3		0.8	0.5G,3.0X	31.9	34.5	AJ1
AL1	SEP	65506.05	279240.31	31.66	31.66	31.66	11	Direct				5	214.27	0.9	0.0561	0.0505	0.0505	30	0.0505	0.0505	30	30		69.6	482.9	0.083	3.02	0.05	0.5	3		0.8	0.5G,3.0X	32.7	36.9	AK1
AM1	HW Double	65493.63	279181.58	30.37	31.14	31.14	3P	Kinematic Wave	597.18	0.4	0.25	229.3	19.1	0.45	18.6082	8.3737	8.3737	444.2	8.3737	8.3737	444.2	444.2		444.2										444.2		-
AM2	HW outlet Double	65525.35	279166.53	30.17	30.95	30.95																														-
AN1	SEP	65500.49	279160.43	32.05	32.05	32.05	11	Direct				5	214.27	0.9	0.0568	0.0511	0.0511	30.4	0.0511	0.0511	30.4	30.4		77.3	482.9	0.087	3.14	0.05	0.5	3		0.8	0.5G,3.0X	34.6	42.8	AI1
AO1	GULLY	65467.16	278839.28	35.83	35.83	35.83	11	Direct				5	214.27	0.9	0.0339	0.0305	13.3797	3321.2	0.0305	2.8112	1673.2	3321.2		3321.2	1579.1	0.157	6.64	0.82	3.2	1		0.8	4G,0.5X	59.2	3262	LOST
							3P	Kinematic Wave	100	2.5	0.25	24	89.36	0.45	29.6648	13.3492			2.7806																	
AO2	SEP	65482.53	278859.15	36.03	36.03	36.03	11	Direct				5	214.27	0.9	0.067	0.0603	0.0603	35.9	0.0603	0.0603	35.9	35.9		35.9	1475.2	0.04	2.17	0.03	2.7	1.9		0.8	2G,1.5X	15	20.9	AZ1
AO3	SEP	65495.39	278874.71	35.87	35.87	35.87	11	Direct				5	214.27	0.9	0.0151	0.0136	0.0136	8.1	0.0136	0.0136	8.1	8.1		11.4	3048.7	0.02	2.2	0.01	3.9	1		0.8	4G,0.5X	5.3	6.2	LOST
AO4	MH	65496.55	278950.97	33.78	33.78	33.78																														-
AO5	SEP TWIN	65507.66	278964.22	33.16	33.16	33.16	11	Direct				5	214.27	0.9	0.1411	0.127	0.127	75.6	0.127	0.127	75.6	75.6		75.6	553.5	0.07	2.44	0.06	1.5	3		0.8	2G,3.0X	33.3	42.2	AO6
AO6	SEP	65509.37	279000.2	32.81	32.81	32.81	11	Direct				5	214.27	0.9	0.05	0.045	0.045	26.8	0.045	0.045	26.8	26.8		69	321.6	0.084	2.95	0.05	0.6	3		0.8	0.5G,3.0X	32.6	36.5	AO7
AO7	SEP	65512.51	279039.32	32.62	32.62	32.62	11	Direct				5	214.27	0.9	0.0534	0.0481	0.0481	28.6	0.0481	0.0481	28.6	28.6		65.1	321.6	0.082	2.88	0.05	0.5	3		0.8	0.5G,3.0X	31.6	33.5	AO8
AO8	SEP	65514.42	279072.59	32.46	32.46	32.46	11	Direct				5	214.27	0.9	0.048	0.0432	0.0432	25.7	0.0432	0.0432	25.7	25.7		59.2	321.6	0.08	2.78	0.04	0.5	3		0.8	0.5G,3.0X	30.1	29.1	AO9
AO9	SEP	65517.66	279119.16	32.23	32.23	32.23	11	Direct				5	214.27	0.9	0.046	0.0414	0.0414	24.6	0.0414	0.0414	24.6	24.6		53.7	321.6	0.077	2.68	0.04	0.5	3		0.8	0.5G,3.0X	28.4	25.3	AO10
AO10	SEP	65520.44	279159.06	32.04	32.04	32.04	11	Direct				5	214.27	0.9	0.0469	0.0422	0.0422	25.1	0.0422	0.0422	25.1	25.1		50.4	321.6	0.075	2.62	0.04	0.5	3		0.8	0.5G,3.0X	27.3	23.1	AO11
AO11	SEP	65523.22	279198.96	31.85	31.85	31.85	11	Direct				5	214.27	0.9	0.0466	0.042	0.042	25	0.042	0.042	25	25		48.1	321.6	0.074	2.57	0.04	0.5	3		0.8	0.5G,3.0X	26.6	21.5	AO12
AO12	SEP	65526	279238.87	31.66	31.66	31.66	11	Direct				5	214.27	0.9	0.0455	0.041	0.041	24.4	0.041	0.041	24.4	24.4		45.9	321.6	0.072	2.53	0.04	0.5	3		0.8	0.5G,3.0X	25.9	20	AO13
AO13	SEP	65529.22	279278.74	31.46	31.46	31.46	11	Direct				5	214.27	0.9	0.0419	0.0377	0.0377	22.4	0.0377	0.0377	22.4	22.4		42.4	321.6	0.07	2.46	0.03	0.5	3		0.8	0.5G,3.0X	24.8	17.7	AO14
AO14	SEP	65531.56	279318.67	31.27	31.27	31.27	11	Direct				5	214.27	0.9	0.0433	0.039	0.039	23.2	0.039	0.039	23.2	23.2		40.9	283.5	0.073	2.54	0.03	0.5	3		0.8	0.5G,3.0X	24.3	16.6	AO15
AO15	COMBO SEP TWIN	65533.97	279353.34	31.2	31.2	31.2	11	Direct				5	214.27	0.9	0.0812	0.0731	0.0731	43.5	0.0731	0.0731	43.5	43.5		60.1	18.4	0.09					0.045	0.5		60.1		-
AO16	HW outlet	65539.1	279355.93	29.7	31.2	31.2																														-
AP1	SEP	65497.7	279120.4	32.24	32.24	32.24	11	Direct				5	214.27	0.9	0.0568	0.0511	0.0511	30.4	0.0511	0.0511	30.4	30.4		82.8	482.9	0.089	3.22	0.05	0.5	3		0.8	0.5G,3.0X	35.9	46.9	AN1
AQ1	SEP	65494.47	279074.03	32.47	32.47	32.47	11	Direct				5	214.27	0.9	0.0572	0.0515	0.0515	30.7	0.0515	0.0515	30.7	30.7		90	482.9	0.092	3.32	0.05	0.5	3		0.8	0.5G,3.0X	37.6	52.4	AP1
AR1	GULLY	65497.64	278862.01	36.37	36.37	36.37	11	Direct				5	214.27	0.9	0.0177	0.0159	0.0159	9.5	0.0159	0.0159	9.5	9.5		9.5	1158.9	0.025	1.11	0.02	3.9	2.3		0.8	4G,1.5X	6.1	3.3	AO3
AS1	GULLY	65468.1	278821.88	35.57	35.57	35.57	11	Direct				5	214.27	0.9	0.065	0.0585	0.0585	34.8	0.0585	0.0585	34.8	34.8		34.8										34.8		-
AS2	GULLY	65502.03	278789.94	35.36	35.36	35.36	11	Direct				5	214.27	0.9	0.0653	0.0588	0.0588	35	0.0588	0.0588	35	35		35	7073.4	0.043	1.55	0.05	3.9	2.8		0.8	4G,1.5X	17.6	17.4	AS3
AS3	SEP	65515.67	278742.79	33.44	33.44	33.54	11	Direct				5	214.27	0.9	0.0819	0.0737	0.0737	43.9	0.0737	0.0737	43.9	43.9		61.3	1278	0.054	1.96	0.06	3.7	3.1		0.8	4G,3.0X	21	40.3	AS4
AS4	SEP	65541.56	278694.49	31.44	31.44	31.44	11	Direct				5	214.27	0.9	0.0821	0.0739	0.0739	44	0.0739	0.0739	44	44		84.3	2594.8	0.047	3.75	0.04	3	1.5		0.8	2G,1.5X	22.3	62	AS6
AS5	MH	65555.9	278689.43	31.3	31.3	31.3																														-
AS6	SEP	65579.52	278646.89	29.81	29.81	29.81	11	Direct				5	214.27	0.9	0.0999	0.0899	0.0899	53.5	0.0899	0.0899	53.5	53.5		115.5	633.5	0.077	2.7	0.09	2.1	3		0.8	2G,3.0X	32.4	83.1	AW1
AS7	GULLY TWIN	65602.37	278644.4	28.76	28.76	28.76																														-
AT1	SEP	65534.28	278827.3	37.6	37.6	37.6																		0					2.5	3		0.8	2G,1.5X	0		LOST
AT2	GULLY	65514.31	278802.33	36.21	36.21	36.21	11	Direct				5	214.27	0.9	0.103	0.0927	0.0927	55.2	0.0927	0.0927	55.2	55.2		55.2	0.4	0.005	0.72	0.16	4.2	2.6		0.8	4G,1.5X	24.1	31.1	LOST
AW1	SEP	65615.78	278597.47	29.05	29.05	29.05	11	Direct				5	214.27	0.9	0.0975	0.0878	37.1033	2232.1	0.0878	1.0582	629.8	2232.1		2315.2	337.9	0.15	5.81	0.38	0.6	3		0.8	0.5G,3.0X	84	2231.2	LOST
							3P	Kinematic Wave	624.5	0.6	0.25	190.72	21.66	0.45	82.2567	37.0155			0.9704																	
AW2	GULLY	65639.59	278596.7	28.15	28.15	28.15																														-
AZ1	SEP TWIN	65485.95	278951.69	33.37	33.37	33.37	11	Direct				5	214.27	0.9	0.1607	0.1447	0.1447	86.1	0.1447	0.1447	86.1	86.1		107	945.1	0.076	2.75	0.08	2	3		0.8	2G,3.0X	40.5	66.5	BD1
B1	SEP TWIN	65381.44	280449.66	36.37	36.37	36.37	11	Direct				5	214.27	0.9	0.0753	0.0678	0.0678	40.3	0.0678	0.0678	40.3	40.3		40.3	6816.1	0.063	2.19	0.04	0.8	3		0.8	1G,1.5X	21.7	18.6	LOST
BB1	COMBO SEP	65408.88	280240.86	35.43	35.43	35.43	11	Direct				5	214.27	0.9	0.1226	0.1103	0.1103	65.7	0.1103	0.1103	65.7	65.7		133.2	5809.6	0.097	3.38	0.08	0.9	3		0.31	1G,3.0X	21.5	111.8	J2
BC1	SEP	65422.38	280246.13	35.43	35.43	35.43	11	Direct				5	214.27	0.9	0.0723	0.0651	0.0651	38.7	0.0651	0.0651	38.7	38.7		70	454.9	0.074	2.6	0.05	1	3		0.8	1G,3.0X	28.8	41.2	I1
BD1	SEP	65489.42	279001.59	32.82	32.82	32.82	11	Direct				5	214.27	0.9	0.0771	0.0694	0.0694	41.3	0.0694	0.0694	41.3	41.3		107.8	482.9	0.098	3.55	0.06	0.5	3		0.8	0.5G,3.0X	40.7	67.1	BE1
BE1	SEP	65492.15	279040.81	32.63	32.63	32.63	11	Direct				5	214.27	0.9	0.0582	0.0524	0.0524	31.2	0.0524	0.0524	31.2	31.2		98.2	482.9	0.095	3.43	0.06	0.5	3		0.8	0.5G,3.0X	38.9	59.3	AQ1
BF1	GULLY	65490.55	279367.73	30.65	30.65	30.65	11	Direct				5	214.27	0.9	0.1269	0.1142	0.1142	68	0.1142	0.1142	68	68		68										68		-
BG1	COMBO SEP TWIN	65511.88	279347.43	31.26	31.26	31.26	11	Direct				5	214.27	0.9	0.089	0.0801	0.0801	47.7	0.0801	0.0801	47.7	47.7		87.6	17.6	0.123					0.047	0.5		87.6		-
C1	SEP TWIN	65367.05	280442.53	36.4	36.4	36.4	11	Direct				5	214.27	0.9	0.1055	0.0949	0.0949	56.5	0.0949	0.0949	56.5	56.5		56.5	5675.7	0.071	2.46	0.05	0.8	3		0.8	1G,3.0X	32.5	24	LOST
Ex J1	MH	65368.75	280447.07	36.77	36.57	36.57																														-
D1	GULLY	65347.56	280369.4	37.08	37.08	37.08	11	Direct				5	214.27	0.9	0.04	0.036	0.036	21.4	0.036	0.036	21.4	21.4		21.4	238.5	0.027	3.69	0.01	1.3	1		0.8	1G,0.5X	8.3	13.1	LOST
D2	MH	65353.57	280366.23	37.08	37.08	37.08																														-
E1	SEP	65393.2	280341.26	36.39	36.39	36.39	11	Direct				5	214.27	0.9	0.0723	0.065	0.065	38.7	0.065	0.065	38.7	38.7		38.7	390.5	0.062	2.16	0.04	0.7	3		0.8	0.5G,3.0X	23.5	15.2	H1
Ex Ak3	MH	65380.84	280338.34	36.77	36.77	36.77																														-
F1	COMBO SEP	65379.58	280335.58	36.28	36.28	36.28	11	Direct				5	214.27	0.9	0.1301	0.1171	0.1171	69.7	0.1171	0.1171	69.7	69.7		69.7	2975.7	0.076	2.65	0.05	0.9	3.5		0.8	1G,3.0X	34.3	35.4	G1
G1	SEP	65391.73	280289.01	35.87	35.87	35.87	11	Direct				5	214.27	0.9	0.125	0.1125	0.1125	67	0.1125	0.1125	67	67		102.4	2995.4	0.087	3.06	0.07	0.9	3.5		0.8	1G,3.0X	34.8	67.6	BB1
H1	SEP	65405.51	280293.54	35.92	35.92	35.92	11	Direct				5	214.27	0.9	0.0677	0.0609	0.0609	36.2	0.0609	0.0609	36.2	36.2		51.5	447.4	0.066	2.32	0.04	1	3		0.8	1G,1.5X	20.2	31.2	BC1
I1	SEP	65443.4	280192.46	34.88	34.88	34.88	11	Direct				5	214.27	0.9	0.1318	0.1186	0.1186	70.6	0.1186	0.1186	70.6	70.6		111.8	454.9	0.089	3.1	0.07	1	3		0.8	1G,3.0X	36.3	75.5	K1
J1	COMBO SEP	65436.92	280169.22	34.77	34.77	34.77	11	Direct				5	214.27	0.9	0.0455	0.041	0.041	24.4	0.041	0.041	24.4	24.4		88.4	2797.2	0.075	3.45	0.05	0.9	2.2		0.8	1G,1.5X	31.6	56.8	LOST
J2	GULLY	65429.8	280187.43	34.94	34.94	34.94																		111.8	2584.7	0.091	3.17	0.07	0.9	3		0.8	1G,3.0X	47.8	64	J1
K1	SEP	65461.39	280146.51	34.41	34.41	34.41	11	Direct				5	214.27	0.9	0.0514	0.3462	0.0462	27.5	0.0462	0.0462	27.5	27.5		103	1672.8	0.086	3.01	0.07	1	3		0.8	1G,3.0X	34.9	68.1	M1
K2	MH	65449.14	280141.65	34.71	34.71	34.71																														-
K3	COMBO SEP	65440.01	280138.03	34.39	34.39	34.39	11	Direct				5	214.27	0.9	0.0731	0.0658	0.0658	39.2	0.0658	0.0658	39.2	39.2		39.2	2285	0.035	3.74	0.02	1.9	0.9		0.8	2G,0.5X	12.6	26.6	M2
Ex A01	MH	65438.19	280137.28	34.53	34.53	34.53																														-
L1	GULLY	65455.38	280128	34.44	34.44	34.44	11	Direct				5	214.27	0.9	0.029	0.0261	0.0261	15.5	0.0261	0.0261	15.5	15.5		15.5	114	0.035	1.88	0.02	1.1	2		0.8	1G,1.5X	9.1	6.5	LOST
M1	COMBO SEP TWIN	65484.27	280088.05	33.91	33.91	33.91	11	Direct				5	214.27	0.9	0.1212	0.1091	0.1091	64.9	0.1091	0.1091	64.9	64.9		133	35.3	0.071					0.071	0.5		35.3	97.7	LOST
M2	COMBO SEP TWIN	65458.92	280080.13	33.71	33.71	33.71																		88.5	1540.7	0.118	5.14	0.04	0.1	3		0.8	0.5G,3.0X	68.5	20	LOST
M3	MH	65454.96	280079.02	33.71	33.71	33.97																														-
N1	HW	65521.81	279075.98	31	31.86	31.86																		0										0		-
N2	HW outlet	65522.52	279088.07	30.93	31.79	31.79																														-
O1	SEP	65498.65	280051.33	34.22	34.22	34.22	11	Direct				5	214.27	0.9	0.0849	0.0764	0.0754	45.5	0.0764	0.0764	45.5	45.5		45.5	723.6	0.053	2.08	0.04	2	2.6		0.8	2G,1.5X	16.5	28.6	LOST
Ex A03	GULLY	65473.83	280042.04	34.04	34.04	34.04																														-
R1	SEP	65515.67	279984.54	35.96	35.96	35.96	11	Direct				5	214.27	0.9	0.0514	0.0462	0.0462	27.5	0.0462	0.0462	27.5	27.5		46	1018.1	0.047	2.43	0.04	2.1	2		0.8	2G,1.5X	17	29	LOST
R2	SEP	65494.91	279997.78	35.24	35.24	35.24	11	Direct				5	214.27	0.9	0.1085	0.0976	0.0976	58.1	0.0976	0.0976	58.1	58.1		90.9	1079.4	0.068	2.47	0.07	2.4	3		0.8	2G,3.0X	28.9	62	M2
Q1	SEP	65530.46	279942.86	36.72	36.72	36.72	11	Direct				5	214.27	0.9	0.0749	0.0674	0.0674	40.1	0.0674	0.0674	40.1	40.1		40.1	500.9	0.057	2	0.04	1.2	3		0.8	1G,3.0X	21.6	18.5	R1
Q2	SEP	65516.35	279938.44	36.43	36.43	36.43	11	Direct				5	214.27	0.9	0.0995	0.0896	0.0896	53.3	0.0896	0.0896	53.3	53.3		53.3	765.8	0.063	2.29	0.05	1.2	3		0.8	1G,1.5X	20.5	32.8	R2
Q3	MH	65491.73	279996.69	35.23	35.23	35.4																														-
S1	SEP	65554.08	279799.17	36.48	36.48	36.48	11	Direct				5	214.27	0.9	0.0942	0.0848	0.0848	50.5	0.0848	0.0848	50.5	50.5		50.5	543	0.06	2.1	0.05	1.6	3		0.8	2G,3.0X	21.7	28.8	U1
S2	SEP	65539.12	279798.78	36.2	36.2	36.2	11	Direct				5	214.27	0.9	0.1429	0.1286	0.1286	76.6	0.1286	0.1286	76.5	76.6		76.6	836.4	0.069	2.48	0.06	1.5	3		0.8	2G,1.5X	21.3	55.2	S3
S3	SEP	65536.19	279716.16	34.2	34.2	34.2	11	Direct				5	214.27	0.9	0.1223	0.11	0.11	65.5	0.11	0.11	65.5	65.5		120.7	1244.6	0.072	2.6	0.09	3.2	3		0.8	4G,3.0X	28.4	92.3	S4
S4	COMBO SEP	65532.83	279669.34	32.88	32.88	32.88	11	Direct				5	214.27	0.9	0.0739	0.0665	0.0655	39.6	0.0665	0.0665	39.5	39.6		131.9	942.7	0.082	2.98	0.09	2.2	3		0.8	2G,3.0X	55.6	76.3	S5
S5	SEP	65530.15	279629.52	32.38	32.38	32.38	11	Direct				5	214.27	0.9	0.0632	0.0569	0.0559	33.9	0.0569	0.0569	33.9	33.9		110.2	596.8	0.091	3.31	0.07	0.7	3		0.8	0.5G,3.0X	41.2	69	S6
S6	SEP	65527.38	279589.62	32.08	32.08	32.08	11	Direct				5	214.27	0.9	0.0583	0.0524	0.0524	31.2	0.0524	0.0524	31.2	31.2		100.2	596.8	0.088	3.19	0.06	0.7	3		0.29	0.5G,3.0X	14.2	86	S7
S7	SEP	65525.04	279559.71	31.86	31.86	31.86	11	Direct				5	214.27	0.9	0.0476	0.0429	0.0429	25.5	0.0429	0.0429	25.5	25.5		111.5	596.8	0.092	3.32	0.07	0.7	3		0.8	0.5G,3.0X	41.4	70.1	S8
S8	COMBO SEP TWIN	65523.01	279530.79	31.67	31.67	31.67	11	Direct				5	214.27	0.9	0.0842	0.0757	0.0757	45.1	0.0757	0.0757	45.1	45.1		115.2	137.5	0.134					0.15	0.5		115.2		-
S9	MH	65516.49	279480.45	32.45	32.45	32.45																														-

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CAUTION

SERVICES SHOWN ARE TO BE USED AS A GUIDE ONLY. SERVICES SHALL BE MANUALLY LOCATED BY HAND PRIOR TO MECHANICAL EXCAVATION. RELEVANT PERMITS SHALL BE OBTAINED PRIOR TO SITE WORKS AND A DBYD ENQUIRY SHALL BE UNDERTAKEN NO EARLIER THAN 30 DAYS BEFORE CONSTRUCTION. A FULL SET OF THE DBYD DOCUMENTS ARE TO BE KEPT ON SITE AT ALL TIMES. CONFLICTING SERVICES ARE TO BE RELOCATED/PROTECTED TO THE SATISFACTION OF THE SERVICE AUTHORITY PRIOR TO WORKS.

REV	DATE	BY	DESCRIPTION
0	04.23	DW	ISSUED FOR CONSTRUCTION

AMENDMENTS

AUTHORISATION

PROJECT MANAGER — DATE

DESIGNED D.WEERTS — CHECKED — DATE

APPROVED

DESIGN CO-ORDINATOR — DATE

DRAWN C.CAYATTE

SCALE: (A1)

DATUM: A.H.D.

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