HENLEY BROOK AVENUE EXTENSION

CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN

Prepared for:	City of Swan
Report Date:	29 August 2023
Version:	3
Report No.	2023-761

pgv ENVIRONMENTAL

Contents

List of Attachments

Tables

Plates

Figures

Appendices

1 INTRODUCTION

1.1 Background

The City of Swan is in the process of widening Henley Brook Avenue south of Gnangara Road and extending the Road through to just south of Henley Street (Figure 1). The proposed road works are within an unmade part of the road reserve at the northern end and mostly through private lots at the southern end (Figure 2).

The widening and extension work will result in the clearing of some native vegetation. An application for a Clearing permit has been submitted to the Department of Water and Environmental Regulation (DWER) (CPS 9953/1).

PGV Environmental was commissioned by the City of Swan to prepare a Construction Environmental Management Plan (CEMP) to be implemented during works to manage the impact of the proposed road works as required by DWER.

1.2 Information Requested

DWER identified a number of risk factors for land degradation to be managed. The factors identified that require management for the construction of the road extension to prevent land degradation are:

- Wind erosion;
- Water erosion;
- Subsurface acidification;
- Flood risk;
- Waterlogging; and
- Phosphorus export risk.

The CEMP includes management measures for dust prevention and stabilisation to minimise the risk of wind and water erosion during clearing and construction to prevent flooding and waterlogging and drainage design to include management of nutrients.

Given that most of the proposed road extension and surrounds are cleared of vegetation it is unlikely that the clearing for the construction of the road will have an impact on subsurface acidification exacerbated by the removal of the small amount of vegetation for the road. Pursuant to the *Contaminated Sites Act 2006* an investigation and if required Acid Sulphate Soils (ASS) Management Plan will be prepared for the road construction if there is any dewatering required or excavation into ASS risk soils. WAPC *Acid Sulphate Soils Planning Guidelines* (WAPC, 2009) indicate that "*acid sulphate soils are technically manageable in the majority of cases*" which would be applicable to the site.

The assessment of the Clearing Permit raised the following factors to be addressed as outlined in Water Quality Protection Notices (WQPN) as the proposed extension is located in a Public Drinking Water Source Area (PDWSA). The site is partly located within the Priority 2 (P2), Priority 3 (P3) and Priority 3* (P3*) as proclaimed under the *Rights in Water and Irrigation Act 1914* (RiWI Act).

P2 areas are normally assigned over rural land and are managed to minimise water quality risks. P3 areas are generally assigned over urban land, with the aim of managing water quality risks. In the Perth metropolitan area, strategic rezoning sometimes results in special priority 3* (P3*) areas, which recognise the increased risks to water quality and additional best management practices are required.

Specifically, the request from DWER states:

> *The preliminary assessment identified that the application area is located within the Priority 2 (P2), Priority 3 (P3) and Priority 3* (P3*) PDWSA proclaimed under the Rights in Water and Irrigation Act 1914 (RiWI Act)).*
>
> *Advice received from the department's Water Source Protection Planning branch indicates that road construction and upgrades would be considered a land use that is compatible with conditions in a P2, P3 and P3* area. However, the Water Source Protection Planning branch has advised that additional information (under specifications) is required to determine whether the proposed road construction and upgrades meets condition 37 specified in WQPN 25 and WQPN's 10, 28, 29, 44, 56 83, 84 and the associated brochure, noting the best environmental practices are applied to the application area*

Condition 37 of the WQPN 25 states:

> *In accordance with Roads to reuse: Product specification – recycled road base and recycled drainage rock:*
>
> - *Do not use recycled drainage rock in PDWSAs.*
> - *Do not use recycled road base in P1 areas, WHPZs and RPZs.*

The definitions of these are within *Roads to Reuse: Product Specification - recycled road base and recycled drainage rock* (Waste Authority, 2018):

> ***recycled drainage rock** means a uniformly blended mixture of coarse grained aggregate typically between 20 and 27 mm in particle size consisting of a mixture of rock, brick and other similar rubble material produced from the crushing and screening of C&D waste. This material does not contain concrete.*
>
> ***recycled road base** means a uniformly blended mixture of coarse and fine aggregate typically less than 19 mm in particle size consisting largely of concrete produced from the crushing and screening of C&D waste.*

The City of Swan confirms that they will not be using recycled drainage rock and recycled road base as meets these definitions due to the proximity of the PDWSA.

Management measures under the WQPNs as detailed in the advice include:

- WQPN 10: Contaminant spills – Emergency response plan (DWER, 2020)
- WQPN 28: Mechanical servicing and workshops (DWER, 2013a)
- WQPN 29: Mobile mechanical servicing and cleaning (DWER, 2013b)
- WQPN 44: Roads near sensitive water resources (DWER, 2006)
- WQPN 56: Tanks for fuel and chemical storage near sensitive water resources (DWER, 2018)

- WQPN 83: Infrastructure corridors near sensitive water resources (DWER, 2007)
- WQPN 84: Rehabilitation of disturbed land in PDWSAs (DWER, 2009)
- Brochure: Construction depots near sensitive water resources (DWER, 2008)

Information with regard to WQPNs 10, 44, 83 and 84 and additional details are provided in the CEMP.

WQPNs 28, 29, 56 and the Brochure are not addressed for the following reasons: There are no mechanical workshops or servicing proposed on the site. No fuels or oils will be stored on the site. There will be no on-site servicing or cleaning or depots constructed as part of the road extension works. There will be machinery stored on the site within a compound of hardstand.

The advice from DWER also identified the wetland habitats that are impacted by the proposed clearing for the road extension and provided the following advice:

> *The preliminary assessment identified that the proposed clearing intersects the St Leonards Creek and intersects 'Multiple use' palusplains (wetlands) (UFI 13758 and UFI 13396), which includes vegetation growing in association with a watercourse / wetland. The proposed clearing may result in the deterioration of surface water quality.*
>
> *Further information is required as to how the above risks to watercourse and wetland values (including surface water quality) resulting from the proposed clearing are proposed to be minimised or managed.*
>
> *A construction environmental management plan (or similar) outlining the strategies and procedures that will be implemented to minimise the impacts of clearing on water quality is recommended to be provided.*

The area of the road works that intersects St Leonards Creek is already predominantly cleared of native vegetation. The management measures included in the CEMP address the impacts on water quality in surrounding wetland areas.

1.3 Scope of Works

The CEMP has been prepared to manage the relevant factors as required by DWER and includes the following:

- Dust management procedures to manage the impacts of potential wind erosion;
- Management of surface water during clearing and construction to prevent waterlogging, water erosion and offsite impacts on surrounding wetland areas;
- Road design and stormwater controls to manage nutrients and petroleum derivatives in stormwater and ensure that there is no contaminant export from the road and ensure water quality and quantity in St Leonards Creek are maintained;
- Stormwater controls to ensure there is no sedimentation in St Leonards Creek;
- An emergency response plan for any potential spills during clearing and construction;
- Hygiene protocols to prevent the spread of dieback disease and other soil-borne pathogens;

- Management of the crossing of St Leonards Creek to ensure impacts on the creekline are minimised; and
- Landscaping strategies to be used in the road reserve.

2 EXISTING ENVIRONMENT

2.1 Topography

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

2.2 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).

The Land Degradation Risk Categories of the soil phases are outlined in Table 1.

Table 1: Land Degradation Risk Categories

Soil Type	Wind Erosion	Water Erosion	Subsurface Acidification	Flood Risk	Waterlogging	Phosphorus Export Risk
212Bs_Ja	50-70% of map unit has a high to extreme wind erosion risk	<3% of map unit has a high to extreme water erosion risk	>70% of map unit has a high subsurface acidification risk or is presently acid	<3% of the map unit has a moderate to high flood risk	<3% of map unit has a moderate to very high waterlogging risk	>70% of map unit has a high to extreme phosphorus export risk
212Bs_Ya	10-30% of map unit has a high to extreme wind erosion risk	<3% of map unit has a high to extreme water erosion risk	>70% of map unit has a high subsurface acidification risk or is presently acid	<3% of the map unit has a moderate to high flood risk	>70% of map unit has a moderate to very high waterlogging risk	10-30% of map unit has a high to extreme phosphorus export risk

Soil Type	Wind Erosion	Water Erosion	Subsurface Acidification	Flood Risk	Waterlogging	Phosphorus Export Risk
212Bs_J	10-30% of map unit has a high to extreme wind erosion risk	50-70% of map unit has a high to extreme water erosion risk	>70% of map unit has a high subsurface acidification risk or is presently acid	50-70% of the map unit has a moderate to high flood risk	>70% of map unit has a moderate to very high waterlogging risk	>70% of map unit has a high to extreme phosphorus export risk
212Bs_VC	3-10% of map unit has a high to extreme wind erosion risk	>70% of map unit has a high to extreme water erosion risk	>70% of map unit has a high subsurface acidification risk or is presently acid	>70% of the map unit has a moderate to high flood risk	>70% of map unit has a moderate to very high waterlogging risk	>70% of map unit has a high to extreme phosphorus export risk

Source – DPIRD, 2023

2.3 Hydrology

2.3.1 Groundwater

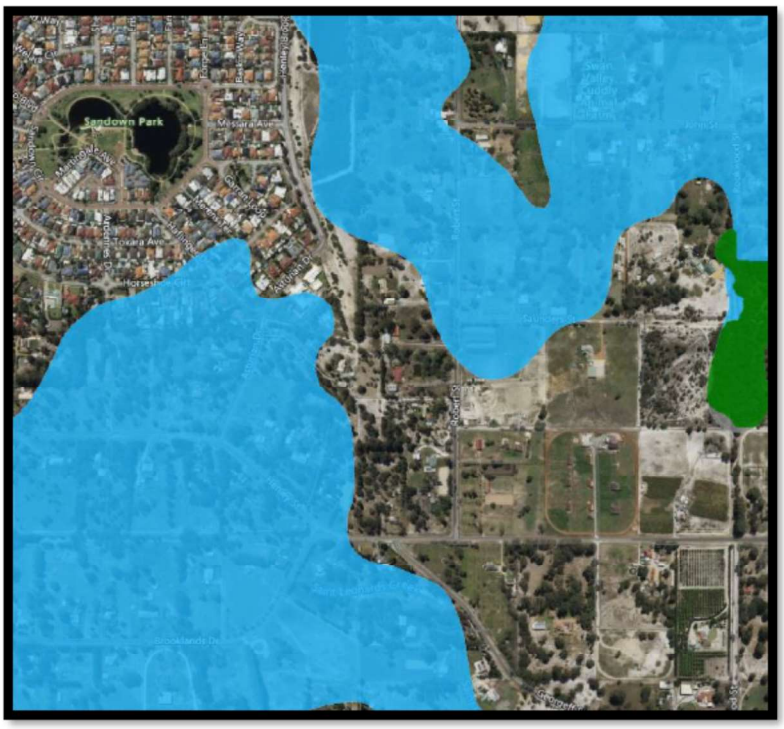
The site is on the Perth Surficial Swan and Mirrabooka aquifer. The Superficial Swan overlays the Leederville aquifer which is further described as the sub area Wanneroo member under the site and consists of poorly sorted fine – to medium-grained quartz with feldspar and occasionally trace heavy minerals.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

2.3.2 Surface Water

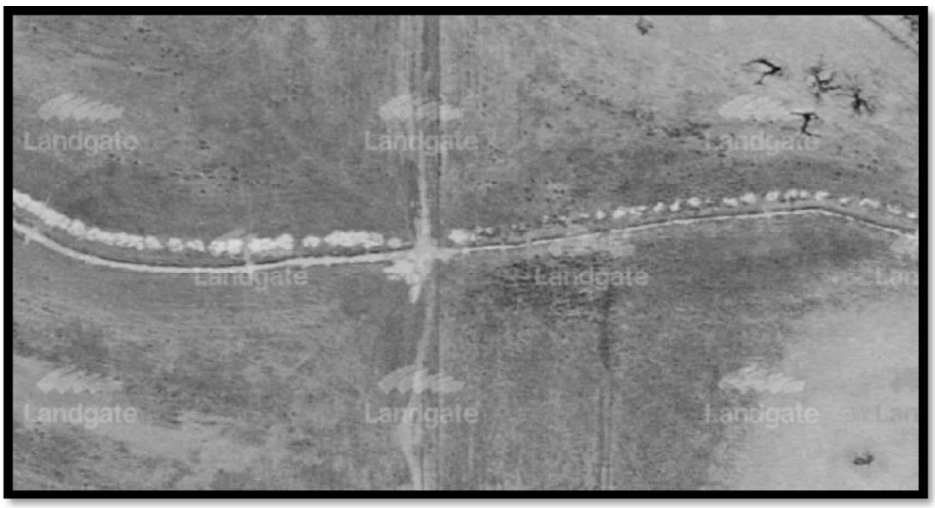
The southern end of the road extension works site passes through a 'Multiple Use' palusplain wetland (UFI 13396) (shown in blue on Plate 1). The wetland in this location is highly modified and largely cleared of native vegetation.

Plate 1: Wetland Mapping (National Map, 2023)



The southern part of the extension also 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



2.4 Vegetation

2.4.1 Vegetation Description

The road reserve in the northern part of the site is mostly cleared and does not contain native vegetation but is dominated by weeds including non-native Geraldton Wax (*Chamelaucium*

uncinatum). A few *Acacia saligna* (Orange Wattle) shrubs and *Adenanthos cygnorum* (Woolly Bush) occur in the northern half.

The vegetation in the central part of 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 trees (*Banksia attenuata, B. menziesii*) and Marri (*Corymbia calophylla*) trees. Most of the Marri trees are young (Plate 8), however several large trees also occur.

2.4.2 Vegetation Condition

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

3 CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN

3.1 Site access

Access to the site will not be possible for the public during road construction. Temporary fences at both ends of the road construction site will be installed as well as along the rear property boundary that abuts the road to prevent public access to the site. The new road is anticipated to remain closed until the entire section to Park St is completed so fencing arrangements will be necessary for a few years. Therefore, a temporary fence or a 1.2m high rural-style fence with star pickets will be installed and fencing will remain until the entire road is complete. The fence will be inspected weekly to ensure its function and placement are maintained. Contractor access points will only be from the existing roads.

Fencing will be inspected daily to ensure it is intact and repairs undertaken as needed as soon as possible after any damage has been reported.

Management Measures

M1 Fencing to be erected around to site to prevent public access

M2 Access to the site to be from existing roads

M3 Weekly inspections of fencing and timely repair of any damage

3.2 Dust Management

3.2.1 Objective

To prevent offsite impacts of dust from wind erosion prone soils.

3.2.2 Site Classification

The site is graded as Classification 2 – Low Risk in accordance with the *A Guideline for Managing the Impacts of Dust and Associated Contaminants from Land Development Sites, Contaminated Sites Remediation and other Related Activities* (DEC, 2011) as per the Site Classification Assessment Chart for Uncontaminated Dust.

3.2.3 Timing

The soil types on the site have a risk of wind erosion and therefore can have a risk of producing dust. The works are proposed to be undertaken in winter and therefore the risk of dust being produced is lowered due to the wet soils at that time of the year. Works may extent into summer at which time management measures as contained in the CEMP will be employed.

3.2.4 Hours of Operation

No works will be carried out after 5:00pm or before 7:00am Monday to Friday and not at all on Sundays or public holidays. Work will only be undertaken on Saturdays unless required.

3.2.5 Advisory Notices

Advisory notices are not required for Classification 2 sites, however residents of properties adjoining the road have been made aware of the intended works. A letter will be sent two weeks prior to commencement advising of the timing and extent of works.

3.2.6 Speed Limits

Low speeds will be maintained during construction in the road reserve to minimise dust generation. Signage will be erected to indicate appropriate travelling speeds.

3.2.7 Access Roads

Access roads are sealed and are not likely to cause an increased nuisance dust issue. If excessive dirt from operations is spilt onto roads that then create significant dust, the management of the dust will be the same as in the areas of active works.

3.2.8 Stripped and Stockpiled Soil

Topsoil will not be stripped in high wind or adverse conditions. Any stockpiles that are generated will be managed in accordance with Guidelines (DEC, 2011) and the contractor will:

- Locate stockpiles in sheltered areas where possible.
- Limit the height and slope of the stockpiles to reduce wind pick up;
- Orient stockpiles lengthwise into the wind so they offer the minimum cross-sectional area to prevailing winds;
- Stabilise stockpiles with mulch or hydromulch if stockpiles are producing nuisance dust; and
- Limit activity to the downwind side of the stockpile.

3.2.9 Water Carts

The soil will be kept damp whilst machinery is working by use of a water cart. The water cart will be kept onsite at all times and will be able to commence watering within 12 hours during the working week and 48 hrs over weekends of a reported dust complaint.

3.2.10 Stabilisation

Approved hydro-mulching equipment will be instructed to be deployed by the City in the event of sustained dust generation from soil piles or exposed banks.

3.2.11 Monitoring

Dust will be monitored by visual observation from the construction site and stockpiles. Installation of dust monitoring equipment is not proposed due to the low risk of dust being an issue.

3.2.12 Complaints Management

The contractor will be notified of any dust related complaint by either the complainant, the Department of Water and Environment Regulation (DWER) or the Local Authority. In the event that justifiable complaint is received, there will be a set protocol to be followed:

1. The site supervisor is informed of the complaint;
2. The site supervisor will contact the appropriate manager;

3. Upon verification of the legitimacy of the complaint the site supervisor will identify the source for the complaint and if possible provide an immediate solution;
4. If an immediate solution is not available the site supervisor will liaise with the manager to develop possible solutions;
5. Works that create dust will be ceased on-site until a solution can be implemented;
6. Upon the implementation of any solution site supervisor will report to the manager; and
7. The complainant will be informed of the actions taken and asked for feedback.

All complaints, actions and outcomes will be recorded and maintained for auditing for the duration of the construction period.

Management Measures

M4 No works will be carried out after 5:00pm or before 7:00am Monday to Saturday and not at all on Sundays or public holidays

M5 Low speed limits to be implemented on the site and signage installed at access points

M6 Stockpiles to be located in sheltered areas, lengthways to prevailing winds with limited height and slope

M7 Stabilise stockpiles with mulch or hydromulch if stockpiles are producing nuisance dust

M8 Water carts to be present in dry conditions

M9 Complaints register to be set up by the contractor

M10 All complaints, actions and outcomes will be recorded and maintained for auditing for the duration of the construction period

M11 Visual monitoring for dust to be undertaken during works

3.3 Surface Water Management

3.3.1 Stormwater

The construction of the road may create areas where surface run-off is exacerbated during construction works. Stormwater will be captured in temporary drainage swales and infiltrated within the road footprint.

The long-term drainage treatment for the proposed extension of Henley Brook Avenue will include a retention basin to be constructed on the north-western side of St Leonards Brook (Appendix 1). The retention basin will retain first flush events, in accordance with the Henley Brook Structure Plan Local Water Management Strategy (LWMS) (Emerge, 2020). The 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 6/m2 is recommended to provide adequate initial coverage and room for growth. Species will be native and planting in accordance with WQPN 84.

Management Measures

M12 Stormwater runoff during construction to be managed in temporary swales

M13 The drainage basin next to St Leonards Creek will be planted with native species as per the Henley Brook Structure Plan LWMS

3.3.2 Erosion and Sedimentation

All batters will be constructed to the specified grade and will be stabilised as soon as possible after they are constructed. The retention basin to be constructed on the west side of the road and close to St Leonards Creek will ensure that soil is not washed into the creekline. Steep road batters will be stabilised with Jute mats or vegetated in accordance with the Landscape Management Plan with stone pitching in areas of surface water overflow to prevent erosion.

During construction any stockpiles showing evidence of water erosion will be stabilised with mulch or hydromulch.

Monitoring of stockpiles, newly contoured land, and batters will be undertaken to inspect for signs of water erosion. Inspections will be undertaken on a weekly basis or after significant rainfall greater than the 1/1 ARI (16 mm in 15 minutes).

Management Measures

M14 Batters to be constructed to specified grades

M15 Batters greater than 1:2 to be stabilised as soon as possible after construction

M16 A retention basin will be constructed near St Leonards Creek to capture first flush stormwater events

M17 Batters greater than 1:2 to be vegetated and stone pitching to be used in stormwater overflow areas

M18 Stabilise stockpiles showing signs of water erosion with mulch or hydromulch

M19 Areas of open soil will be inspected weekly or after a 1/1 ARI rainfall event for signs of water erosion or sedimentation

3.4 Wetland Protection

The footprint of the road runs through St Leonards Creek which is a highly modified creekline that transports water downstream in winter/spring. The creekline has been completely cleared in the past and excavated to provide a drainage function to the surrounding land. Box culverts will be installed under the road at the creek crossing to ensure the function of the creekline is maintained. The construction of the crossover of the creekline will be undertaken in accordance with requirements of the Bed and Banks licence.

Management Measures

M20 St Leonards Creek crossover to be constructed using boxed culverts to ensure pre development water flows are maintained.

3.5 Spills Management

Refuelling machinery will need to take place on-site daily using a fuel trailer located within the compound. Refuelling on site will be undertaken on a sealed or bunded surface within the compound and construction vehicles will not be left unattended when refuelling.

To mitigate the risk of localised spill of hydrocarbon or other contaminant during construction the following will be undertaken:

- All portable toilets will be located in flat areas and managed by an appropriate contractor;
- No hydrocarbons or other hazardous materials will be stored outside of the compound; and
- A spill kit will be available at the site compound and any hydrocarbon spills will be cleaned up appropriately.

Management Measures

M21 Refuelling on site shall be undertaken on a sealed or bunded surface within the compound and never left unattended during refuelling.

M22 Portable toilets to be placed on level ground.

M23 A spill kit will be available at the site compound.

3.6 Emergency Response Plan

An Emergency Response Plan as per WQPN 10: *Contaminant spills – Emergency response plan* will be implemented. In the event of a serious emergency at the site, the following procedure will be followed:

1. Stop work.
2. All personnel shall leave the work zone and return to the emergency assembly area.
3. Await further instructions from the Construction Contractor and/or appointed representative.

Personnel will not return to the work area unless advised to do so by the Construction Contractor or an appointed representative. The Construction Contractor will notify the relevant service as to the details regarding any emergency as outlined in Table 4.

Table 2: Emergency Contact Information

Name	Contact Number
Ambulance / Police / Fire Brigade	000
Department of Environment Regulation Pollution Response Services (24/7)	1300 784 782
Wildcare helpline	(08) 9474 9055
City of Swan	(08) 9267 9267

Records will be kept of any incidents, accidents, hazardous situations, unusual events and unsafe health exposures and the corrective action taken. Emergency procedures and contact telephone numbers will be available on site at all times at a central location.

Management Measures

M24 Emergency procedure to be available on-site and followed if an emergency occurs

M25 Reporting of any emergencies as required

3.7 Dieback

3.7.1 Dieback Status

There are very few native plants remaining in the road reserve and as such the area is deemed to be 'Uninterpretable' for dieback.

3.7.2 Dieback Management

Phytophthora Dieback (*Phytophthora cinnamomi*) is a soil-borne pathogen that infects the roots of vulnerable species, limiting the roots ability to take up water, thereby weakening or killing the host plant. The spores of *Phytophthora* Dieback are transported by water and in soil. In sloping areas *Phytophthora* dieback spreads quickly in surface and sub-surface water flows. It spreads slower up-slope and on flat ground because it is restricted to movement by root-to-root contact.

Hygiene management procedures will be implemented on the site with signage erected at all access points to the development area. The signs should include the following procedures:

- Vehicle inspection protocols to ensure the vehicle is free from soil/organic material prior to entry and exit;
- Brush down of contaminated vehicles and machinery in dry weather
- Wash down of contaminated vehicles and machinery used in clearing with suitable disinfectant such as bleach dilution, methylated spirits or an approved product such as Phytoclean during wet weather.

The spread of *Phytophthora* Dieback is more prevalent in the winter months when the soil is wet and overland flows can spread the disease quickly. Initial clearing works will be scheduled as much as possible in drier conditions when the development areas are not waterlogged or have flowing water down drainage channels.

To prevent transfer of potentially infected soil into adjoining areas there will be no access to the adjoining areas outside of designated access points and no soil will be pushed into these areas. Earthworks will ensure that no contours are created that drain surface water from the development area to outside of the road reserve. Stockpiles of soil and mulch will be located and oriented as per the dust management plan (Section 3.2).

All soils or mulch to be imported to the site during works will be disease and pathogen free. All plants used for landscaping will be free of dieback. Any building materials will be free from soil.

Management Measures

M26 Soil in the construction footprint of grades greater than 1:2 will be stabilised so it is not prone to water erosion and being washed into adjoining areas.

M27 The following hygiene protocols will be followed:

- Vehicle inspection protocols to ensure the vehicle is free from soil/organic material prior to entry and exit;
- Brush down of contaminated vehicles and machinery in dry weather
- Wash down of contaminated vehicles and machinery used in clearing with suitable disinfectant such as bleach dilution, methylated spirits or an approved product such as Phytoclean during wet weather.

M28 Clearing works will be scheduled as much as possible when areas do not have flowing water or are waterlogged.

M29 There will be no soil pushed to the outside of the road footprint

M30 All imported landscaping and revegetation materials (i.e. soil, mulch, seedlings) brought onsite will be weed and certified dieback free.

M31 Imported pipes, stone pitching materials and other construction materials are to be free of mud and soil.

3.8 Landscaping

Landscaping in the drainage basin will be made up of largely native species. The retention basin will be planted with a mixed of reeds to trap any sediments and utilise any nutrient run-off to ensure that no nutrients are exported from the road.

Management Measure

M32 Landscaping to be mixture of native species with appropriate nutrient stripping species to be used in drainage infrastructure

3.9 Induction

The Construction Environmental Management Plan will be supplied by the Construction Superintendent to contractors on the site and the induction will address all management procedures and requirements outlined in this plan.

Management Measure

M33 CEMP to be provided as part of Induction Package

4 SUMMARY OF MANAGEMENT PLAN

Table 3 outlines the management actions as contained in the CEMP

Table 3: Summary of Management Plan

Factor	No.	Management Action
Access	M1	Fencing to be erected around to site to prevent public access
	M2	Access to the site to be from existing roads
	M3	Weekly inspections of fencing and timely repair of any damage
Dust Management	M4	No works will be carried out after 5:00pm or before 7:00am Monday to Saturday and not at all on Sundays or public holidays
	M5	Low speed limits to be implemented on the site and signage installed at access points
	M6	Stockpiles to be located in sheltered areas, lengthways to prevailing winds with limited height and slope;
	M7	Stabilise stockpiles with mulch or hydromulch if stockpiles are producing nuisance dust
	M8	Water carts to be present in dry conditions
	M9	Complaints register to be set up by the contractor
	M10	All complaints, actions and outcomes will be recorded and maintained for auditing for the duration of the construction period
	M11	Visual monitoring for dust to be undertaken during works
Stormwater	M12	Stormwater runoff during construction to be managed in temporary swales
	M13	The drainage basin next to St Leonards Creek will be planted with native species as per the Henley Brook Structure Plan LWMS
Erosion and Sedimentation	M14	Batters to be constructed to specified grades
	M15	Batters greater than 1:2 to be stabilised as soon as possible after construction
	M16	A retention basin will be constructed near St Leonards Creek to capture first flush stormwater events
	M17	Batters greater than 1:2 to be vegetated and stone pitching to be used in stormwater overflow areas
	M18	Stabilise stockpiles showing signs of water erosion with mulch or hydromulch
	M19	Areas of open soil will be inspected weekly or after a 1/1 ARI rainfall event for signs of water erosion or sedimentation
Wetland Protection	M20	St Leonards Creek crossover to be constructed using boxed culverts to ensure pre development water flows are maintained.
Spills Management	M21	Refuelling on site shall be undertaken on a sealed or bunded surface within the compound and never left unattended during refuelling
	M22	Portable toilets to be placed on level ground
	M23	A spill kit will be available at the site compound

Factor	No.	Management Action
Emergency Response Plan	M24	Emergency procedure to be available on-site and followed if an emergency occurs
	M25	Reporting of any emergencies as required
Dieback	M26	Soil in the construction footprint of grades greater than 1:2 will be stabilised so it is not prone to water erosion and being washed into adjoining areas.
	M27	The following hygiene protocols will be followed: • Vehicle inspection protocols to ensure the vehicle is free from soil/organic material prior to entry and exit; • Brush down of contaminated vehicles and machinery in dry weather • Wash down of contaminated vehicles and machinery used in clearing with suitable disinfectant such as bleach dilution, methylated spirits or an approved product such as Phytoclean during wet weather.
	M28	Clearing works will be scheduled as much as possible when areas do not have flowing water or are waterlogged.
	M29	There will be no soil pushed to the outside of the road footprint
	M30	All imported landscaping and revegetation materials (i.e. soil, mulch, seedlings) brought onsite will be weed and certified dieback free.
	M31	Imported pipes, stone pitching materials and other construction materials are to be free of mud and soil.
Landscaping	M32	Landscaping to be mixture of native species with appropriate nutrient stripping species to be used in drainage infrastructure
Induction	M33	CEMP to be provided as part of Induction Package

5 REFERENCES

Bolland, M. (1998) *Soils of the Swan Coastal Plain.* Department of Agriculture. Bunbury, Western Australia.

Department of Environment and Conservation (DEC) (2011) *A Guideline for Managing the Impacts of Dust and Associated Contaminants from Land Development Sites, Contaminated Sites Remediation and other Related Activities.* Perth, Western Australia

Department of Environmental Protection (DEP) (1996) *Land Development Sites and Impacts on Air Quality - A Guideline for the Prevention of Dust and Smoke Pollution from Land Development Sites in Western Australia* Perth Western Australia.

Department of Primary Industries and Regional Development (DPIRD) (2023) Natural Resource Management Shared Land Information Platform. Accessed June 2023 http://maps.agric.wa.gov.au/nrminfo/framesetup.asp Government of Western Australia, Perth.

Department of Water and Environmental Regulation (DWER) (2006) Water Quality Protection Note 44 *oads near sensitive water resources* Government of Western Australia, Perth.

Department of Water and Environmental Regulation (DWER) (2007) Water Quality Protection Note 83 *Infrastructure corridors near sensitive water resources* Government of Western Australia, Perth.

Department of Water and Environmental Regulation (DWER) (2008) Brochure *Construction depots near sensitive water resources* Government of Western Australia, Perth.

Department of Water and Environmental Regulation (DWER) (2009) Water Quality Protection Note 84 *Rehabilitation of disturbed land in public drinking water source areas* Government of Western Australia, Perth.

Department of Water and Environmental Regulation (DWER) (2013a) Water Quality Protection Note 29 *Mechanical servicing and workshops* Government of Western Australia, Perth.

Department of Water and Environmental Regulation (DWER) (2013b) Water Quality Protection Note 28 *Mobile mechanical servicing and cleaning* Government of Western Australia, Perth.

Department of Water and Environmental Regulation (DWER) (2018) Water Quality Protection Note 56 *Tanks for fuel and chemical storage near sensitive water resources* Government of Western Australia, Perth.

Department of Water and Environmental Regulation (DWER) (2020) Water Quality Protection Note 10 *Contaminant spills — emergency response plan* Government of Western Australia, Perth.

Emerge (2020) *Henley Brook Structure Plan Local Water Management Strategy* Perth, Western Australia

Environmental Protection Authority (EPA) (2000) *Guidance Statement No. 18 Prevention of air quality impacts from land development sites.* Perth Western Australia.

Government of Western Australia (2000) Bush Forever - *Keeping the Bush in the City. Volume 2: Directory of Bush Forever Sites*. Perth, Western Australia.

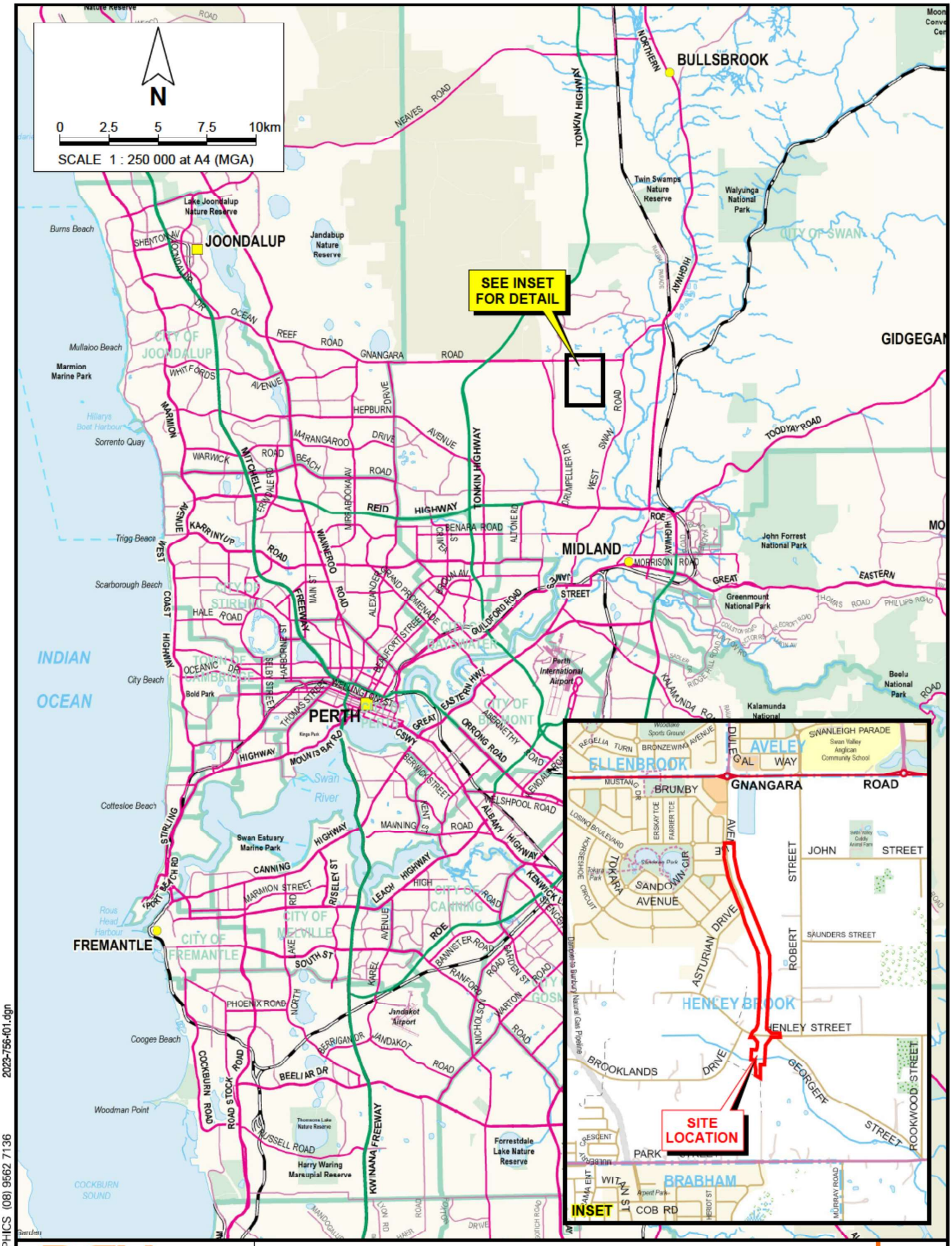
Landgate (2023) Historical Aerial Photography Accessed June 2023 https://www.landgate.wa.gov.au/bmvf/app/mapviewer/ Government of Western Australia,

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 June 2023 Government of Australia

Waste Authority (2018) *Roads to Reuse: Product Specification - recycled road base and recycled drainage rock* Perth, Western Australia

FIGURES



PINPOINT CARTOGRAPHICS (08) 9662 7136 2023-756-f01.dgn

pgv ENVIRONMENTAL

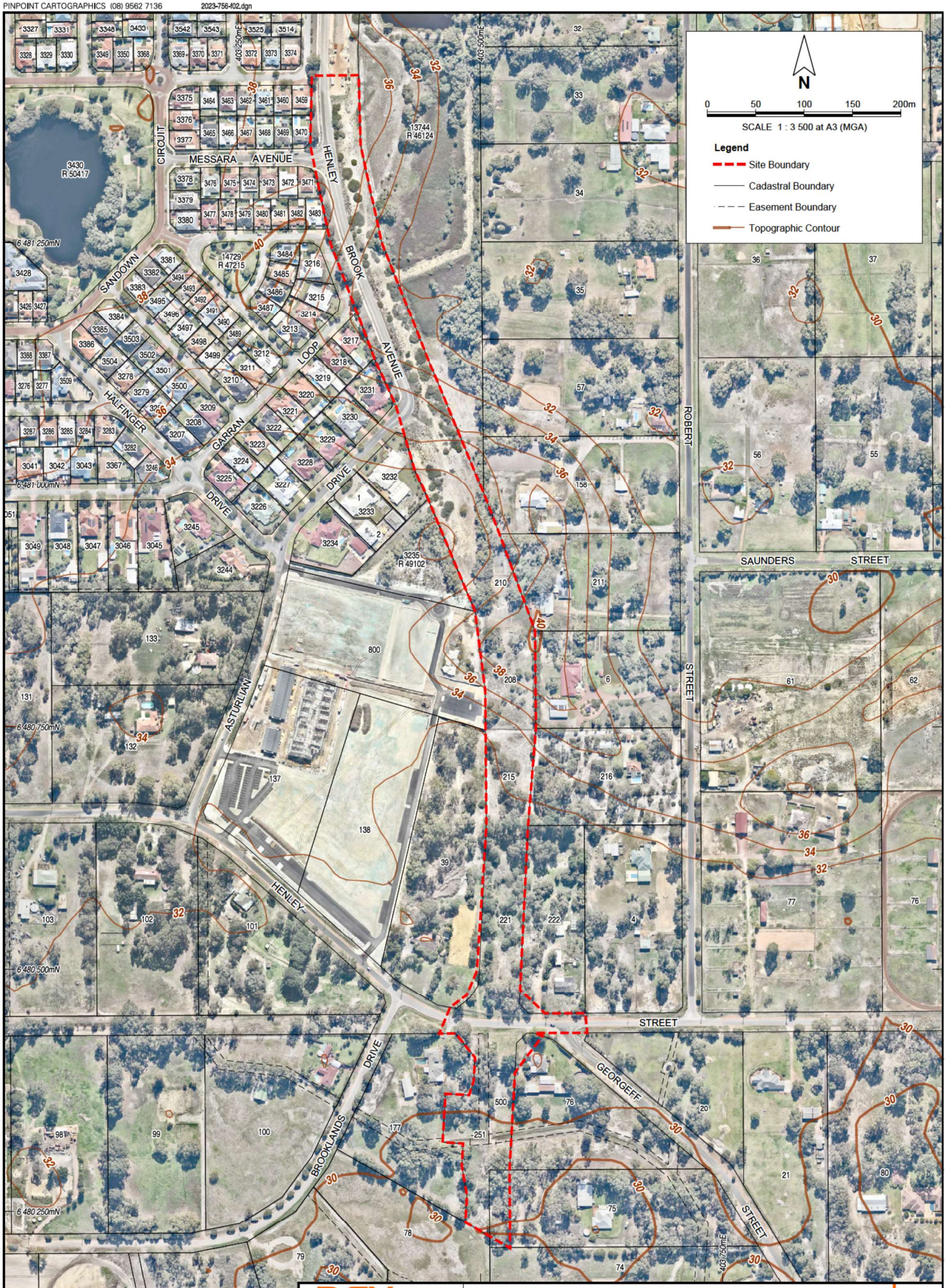
City of Swan
CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN
HENLEY BROOK AVENUE ROAD WORKS

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

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

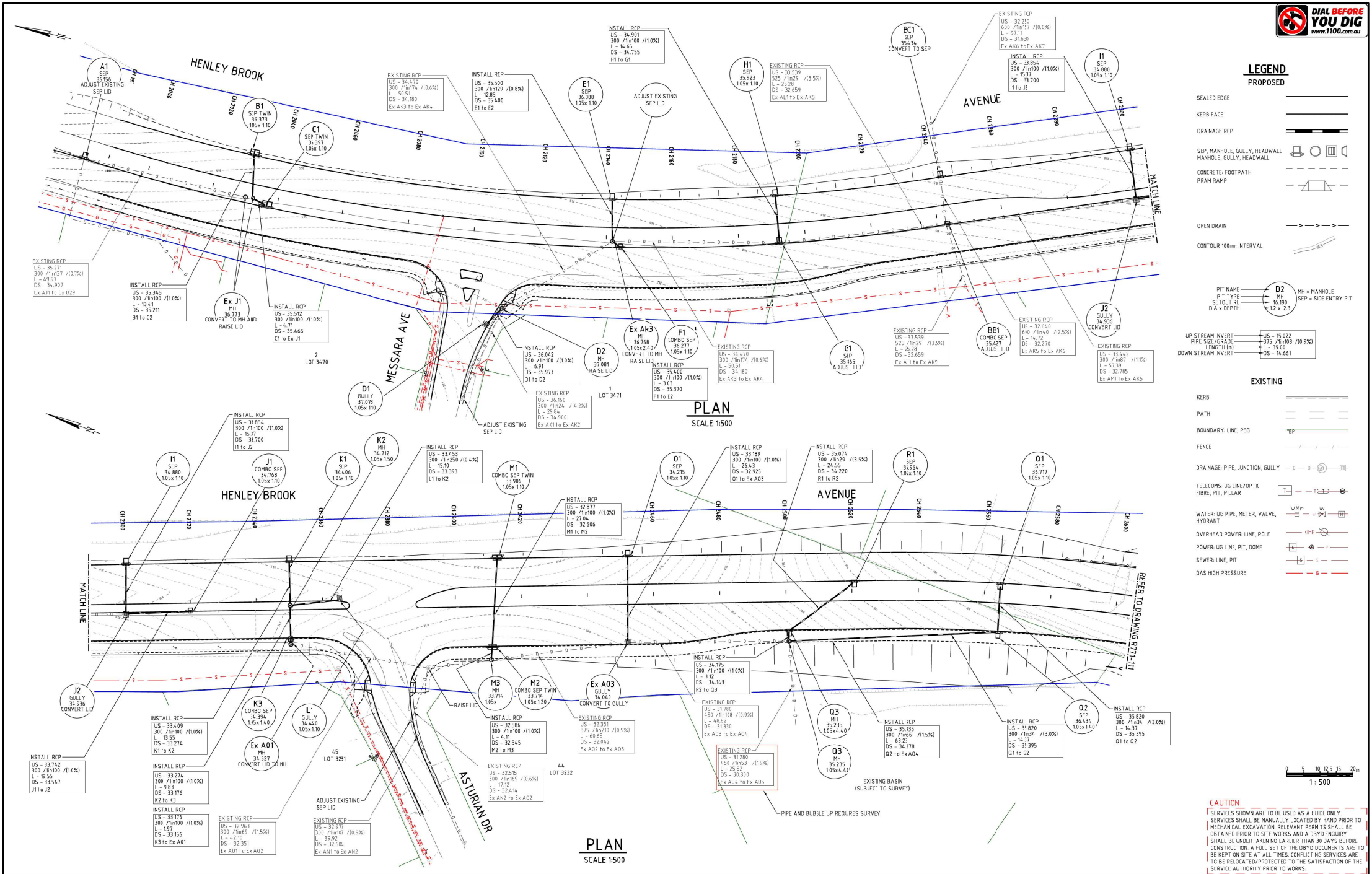
City of Swan
CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN
HENLEY BROOK AVENUE ROAD WORKS

SITE BOUNDARY AND TOPOGRAPHY

Figure 2

APPENDIX 1

Drainage Design



DIAL BEFORE YOU DIG www.1100.com.au

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 — e.g. 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 — e.g. US – 15.022, 375 /1in108 (0.9%), 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

1 : 500

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.

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: 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

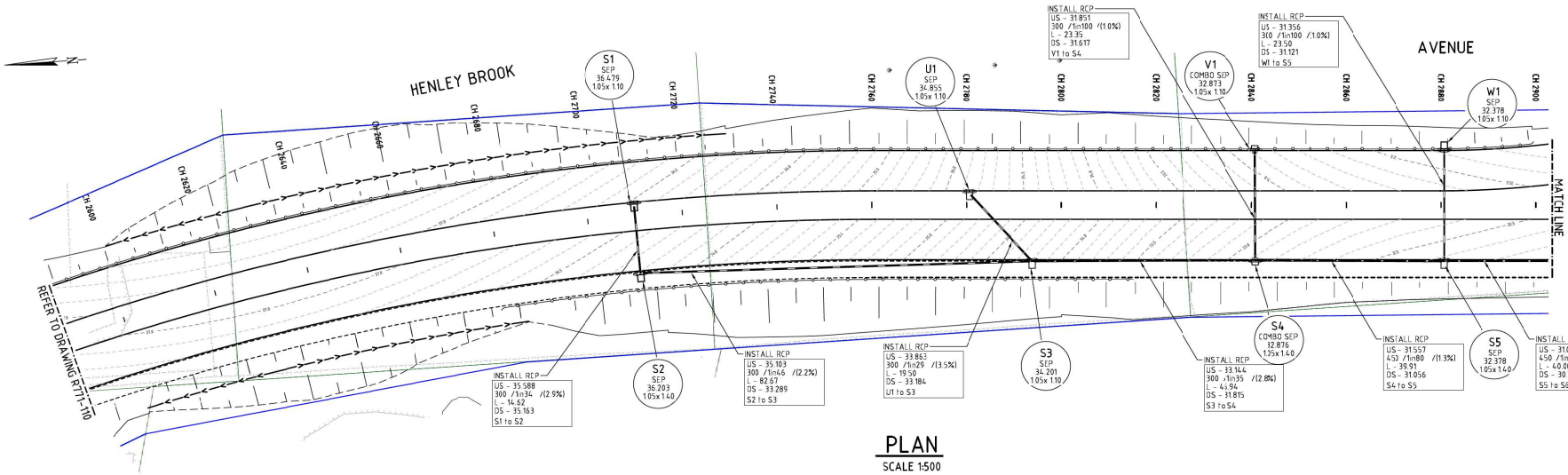
PROFORM CIVIL ENGINEERING GROUP www.proformcivil.com

city of swan

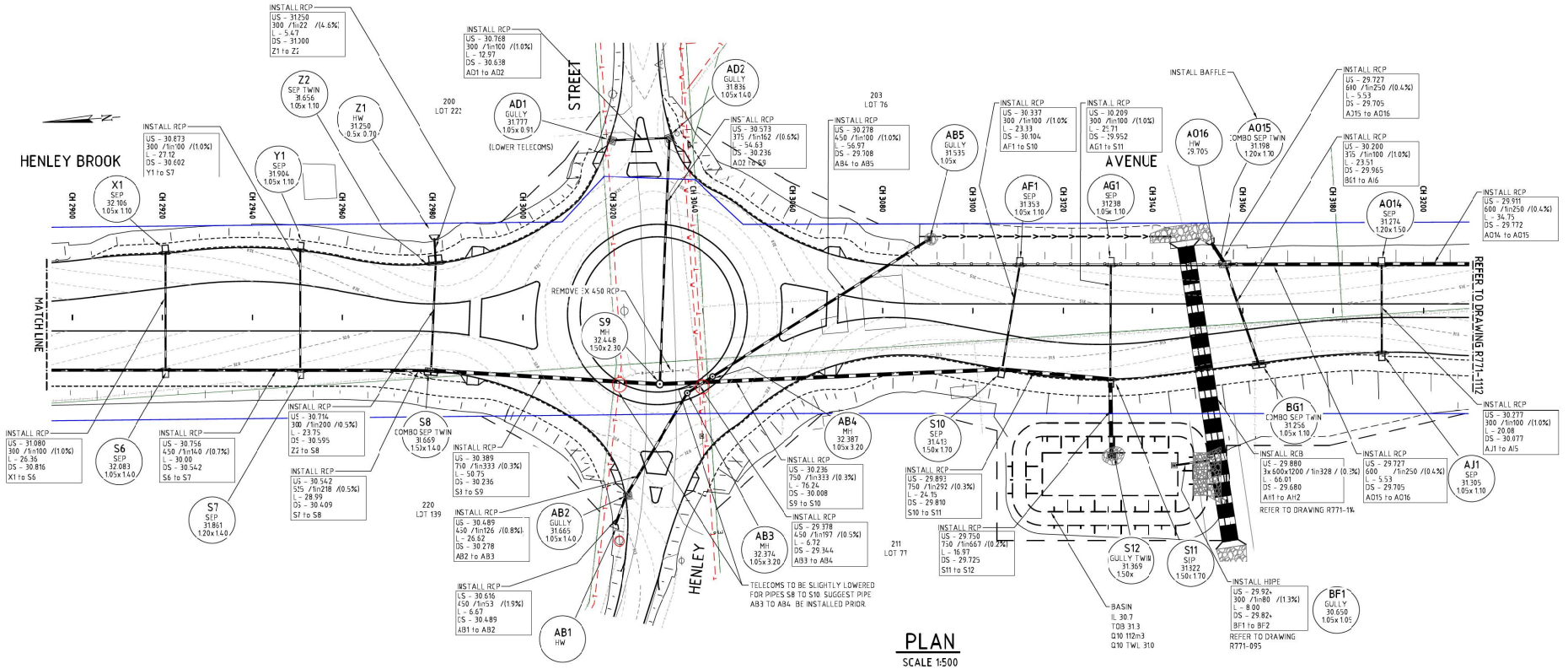
DRAWING No: R771-110

REV No: 0

OPERATIONS



PLAN
SCALE 1:500



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 / SET OUT RL / DIA x DEPTH — e.g. D2 / MH / 15.190 / 1.2 x 2.3 (MH = MANHOLE, SEP = SIDE ENTRY PIT)

UP STREAM INVERT / PIPE SIZE/GRADE / LENGTH (m) / DOWN STREAM INVERT — e.g. US – 15.022 / 375 /1in108 /(0.9%) / – 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

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.

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

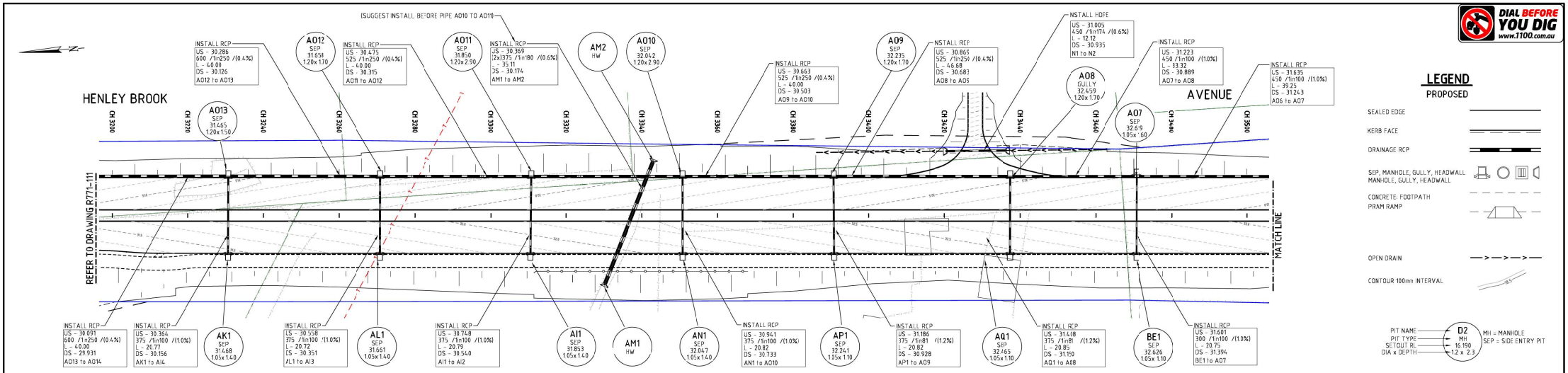
HENLEY BROOK AVE - STAGE 3
MESSARA AVENUE TO PARK STREET
DUAL CARRIAGEWAY
DRAINAGE PLAN SHEET 2 OF 4

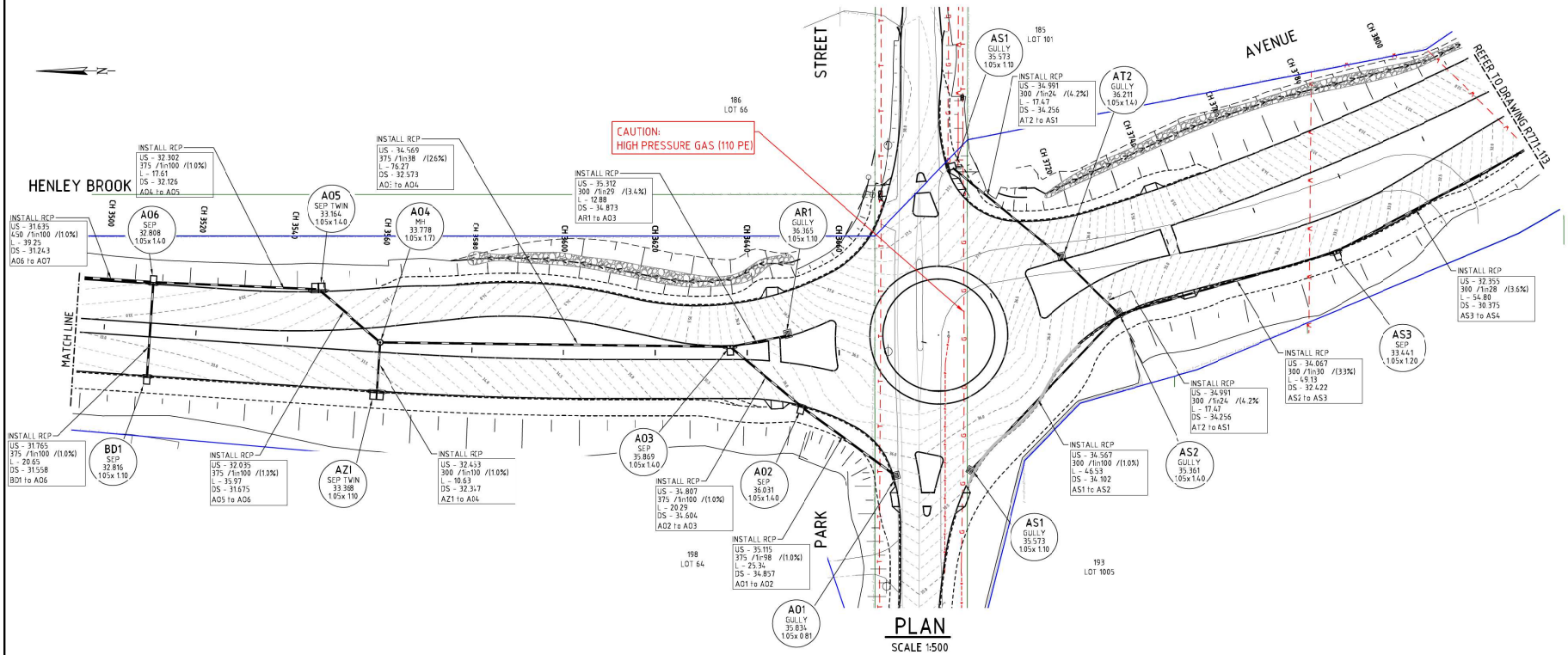
PROFORMCIVIL ENGINEERING GROUP www.proformcivil.com

city of swan

DRAWING No: R771-111
REV No: 0

OPERATIONS





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 / SET OUT RL / DIA x DEPTH — D2 / MH / 15.190 / 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%) / 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

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.

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: 1:500 (A1)

DATUM: A.H.D.

HENLEY BROOK AVE - STAGE 3

MESSARA AVENUE TO PARK STREET

DUAL CARRIAGEWAY

DRAINAGE PLAN SHEET 3 OF 4

PROFORM CIVIL ENGINEERING GROUP www.proformcivil.com

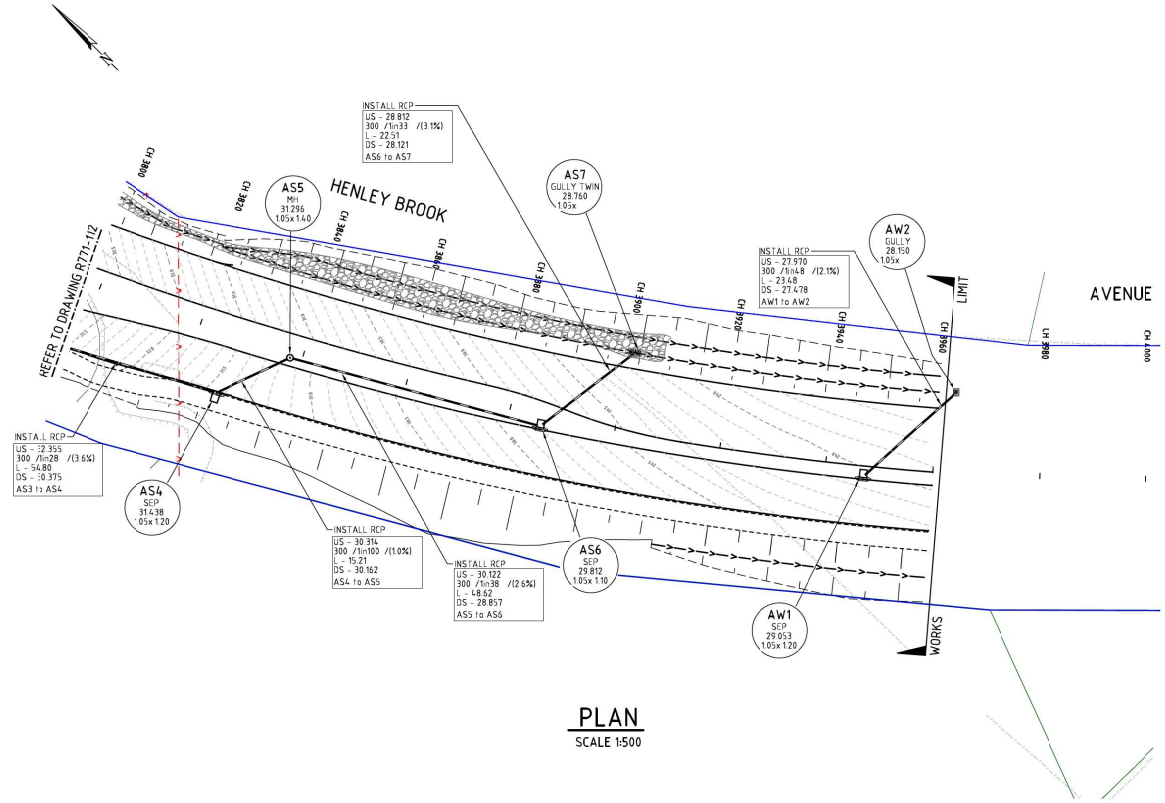
city of swan

DRAWING No: R771-112

REV No: 0

OPERATIONS

DIAL BEFORE YOU DIG www.1100.com.au



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%)
- 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

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.

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: 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.

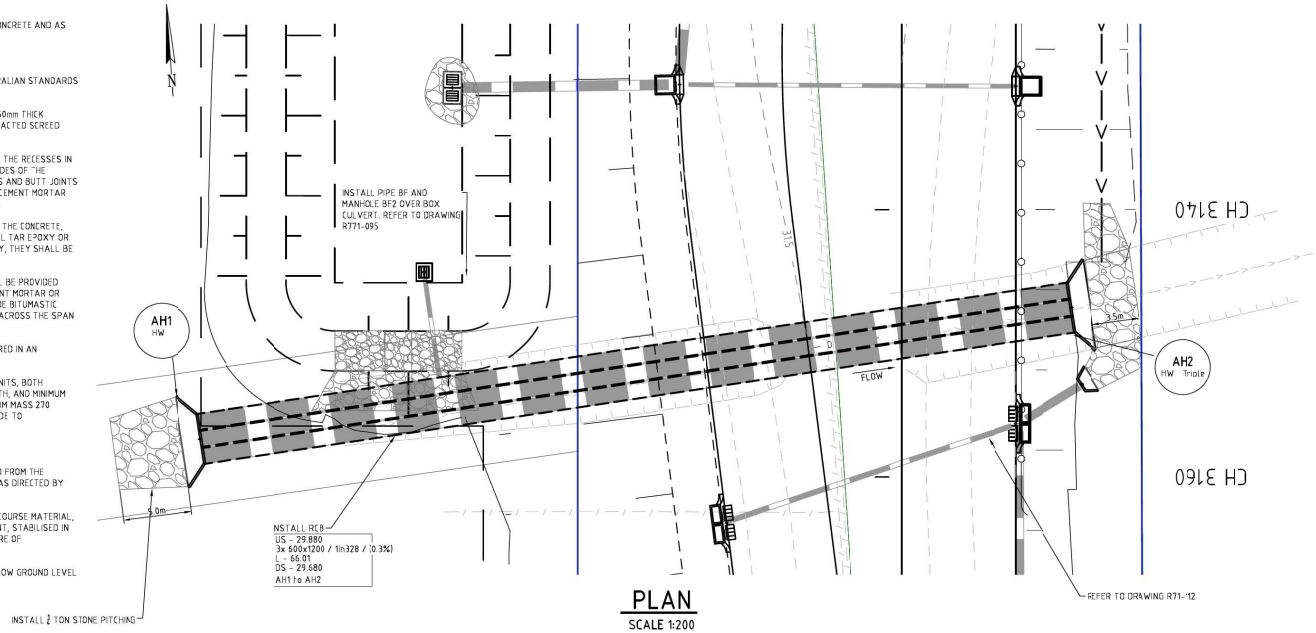
2.7. ALL EXTERNAL SURFACES OF JOINTS BETWEEN PRECAST CROWN UNITS, BOTH LATERALLY AND LONGITUDINALLY, SHALL BE COVERED FULL LENGTH, AND MINIMUM 250mm WIDTH, WITH STRIPS OF NON-WOVEN GEOTEXTILE OF MINIMUM MASS 270 GRAMS PER SQUARE METRE IN ACCORDANCE WITH AUSTROADS GUIDE TO GEOTEXTILES.

3. FOUNDATION & BACKFILL

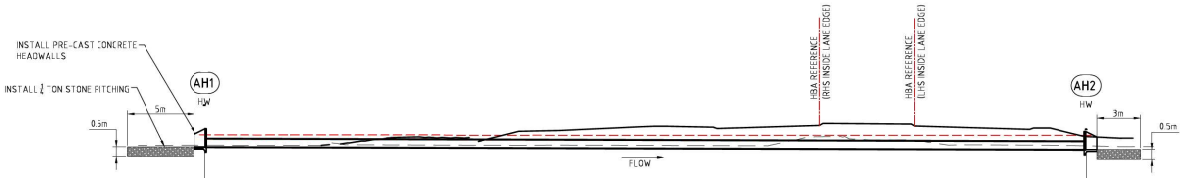
3.1. ALL SOFT, YIELDING OR UNSUITABLE MATERIAL SHALL BE REMOVED FROM THE FOUNDATION AND REPLACED WITH ORDINARY BACKFILL MATERIAL AS DIRECTED BY THE SUPERINTENDENT.

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.

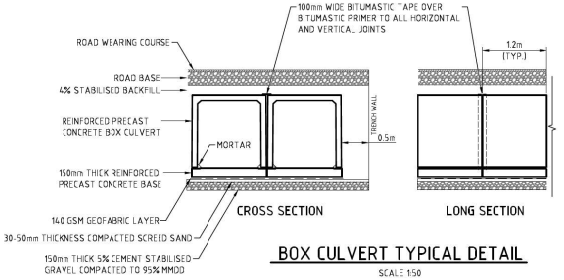


PLAN
SCALE 1:200



Diameter (mm)		(3x1x600 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		30.7+
INVERT LEVEL		29.88	29.68	29.43
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	0.01		66.01	

PROFILE
SCALE 1:200



BOX CULVERT TYPICAL DETAIL
SCALE 1:50

0 2 4 5 6 8m
1 : 200

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.

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

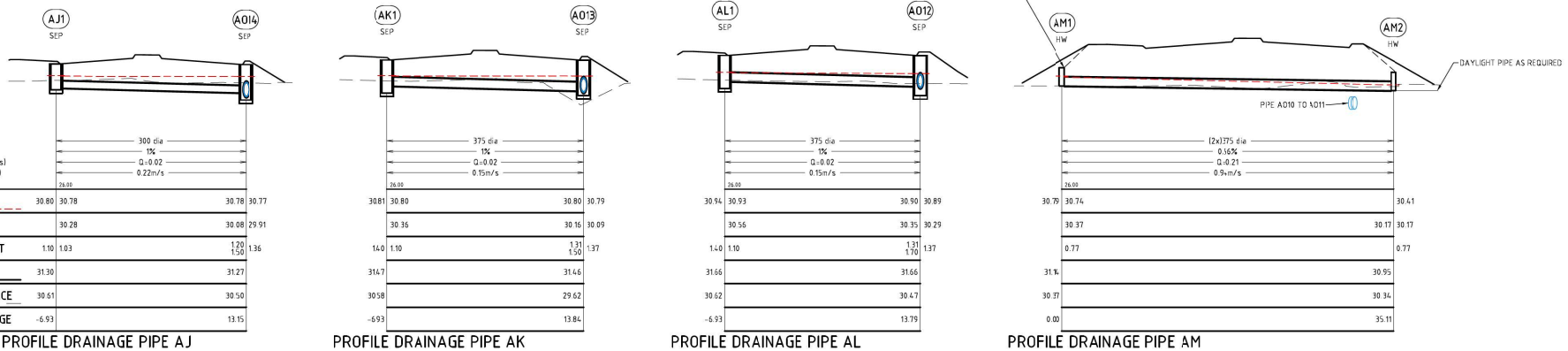
HENLEY BROOK AVE - STAGE 3
MESSARA AVENUE TO PARK STREET
DUAL CARRIAGEWAY
DRAINAGE PROFILES SHEET 1 OF 7

PROFORM CIVIL 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	

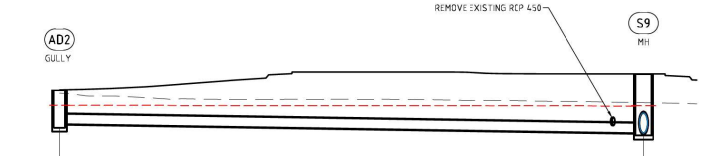
PROFILE DRAINAGE PIPE AK

	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

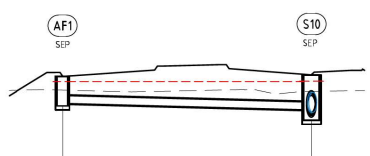
	AM1		AM2	
Diameter (mm)		(2x)375 dia		
Pipe Grade (%)		0.16%		
Design Flow (Q10 Cumecs)		Q=0.21		
Pipe Velocity (Q10 Flow)		0.94m/s		
DATUM RL	26.00			
HGL 10 YEAR	30.79	30.74		30.41
INVERT LEVEL		30.37		30.17
DEPTH TO INVERT		0.77		0.77
DESIGN SURFACE	31.14			30.95
NATURAL SURFACE	30.37			30.34
RUNNING CHAINAGE	0.00			35.11

PROFILE DRAINAGE PIPE AM



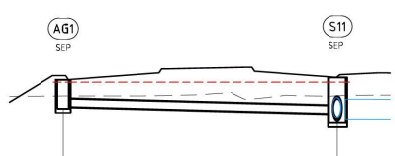
	AD2		S9	
Diameter (mm)		375 dia		
Pipe Grade (%)		0.62%		
Design Flow (Q10 Cumecs)		Q=0.04		
Pipe Velocity (Q10 Flow)		0.33m/s		
DATUM RL	27.00			
HGL 10 YEAR	31.29	31.27	31.25 / 31.26	31.22
INVERT LEVEL	30.64	30.57	30.24	30.24
DEPTH TO INVERT	1.20 / 1.40	1.26	2.30	2.21
DESIGN SURFACE	31.84		32.45	
NATURAL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

PROFILE DRAINAGE PIPE AD



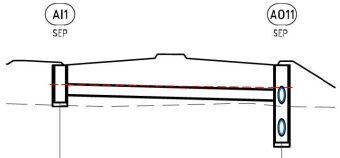
	AF1		S10	
Diameter (mm)		300 dia		
Pipe Grade (%)		1%		
Design Flow (Q10 Cumecs)		Q=0		
Pipe Velocity (Q10 Flow)		0m/s		
DATUM RL	26.00			
HGL 10 YEAR	31.17	31.17		31.15
INVERT LEVEL	30.34	30.10		29.89
DEPTH TO INVERT	1.10	1.02	1.31 / 1.70	1.52
DESIGN SURFACE	31.35		31.41	
NATURAL SURFACE	30.84		30.79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

PROFILE DRAINAGE PIPE AF



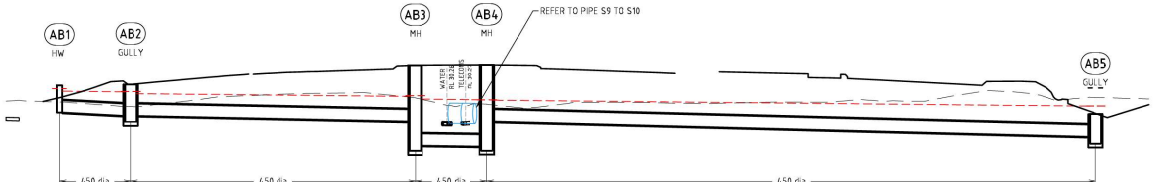
	AG1		S11	
Diameter (mm)		300 dia		
Pipe Grade (%)		1%		
Design Flow (Q10 Cumecs)		Q=0		
Pipe Velocity (Q10 Flow)		0m/s		
DATUM RL	26.00			
HGL 10 YEAR	31.14		31.14 / 31.5	31.10
INVERT LEVEL	30.21		29.55	29.75
DEPTH TO INVERT	1.10	1.03	1.37 / 1.70	1.57
DESIGN SURFACE	31.24		31.22	
NATURAL SURFACE	30.62		30.63	
RUNNING CHAINAGE	-6.93		18.78	

PROFILE DRAINAGE PIPE AG



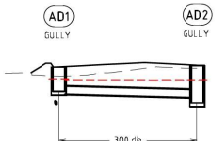
	AI1		AO11	
Diameter (mm)		375 dia		
Pipe Grade (%)		1%		
Design Flow (Q10 Cumecs)		Q=0.02		
Pipe Velocity (Q10 Flow)		0.15m/s		
DATUM RL	26.00			
HGL 10 YEAR	31.12		31.02	31.00
INVERT LEVEL	30.75		30.54	30.48
DEPTH TO INVERT	1.40	1.10	1.31 / 2.90	1.37
DESIGN SURFACE	31.85		31.85	
NATURAL SURFACE	30.35		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	1.00	1.04 / 3.20	2.11	0.84 / 1.10
DESIGN SURFACE	31.63	31.66			32.37		31.39		30.55
NATURAL SURFACE	31.01	30.83			31.16		30.92		31.18
RUNNING CHAINAGE	0.00	6.67			33.29		43.02		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		31.34
NATURAL SURFACE	31.42		31.13
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

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.

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: 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

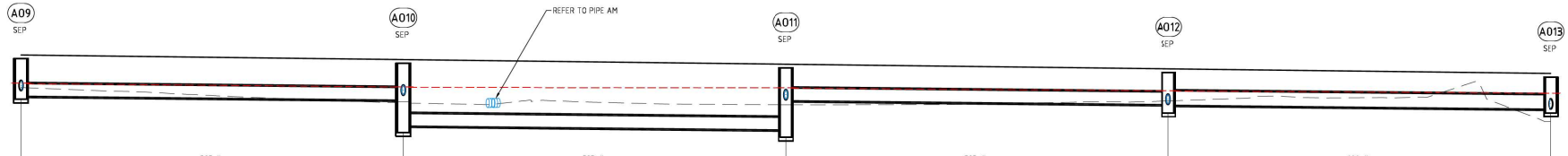
PROFORMCIVIL ENGINEERING GROUP www.proformcivil.com

city of swan

DRAWING No: R771-115

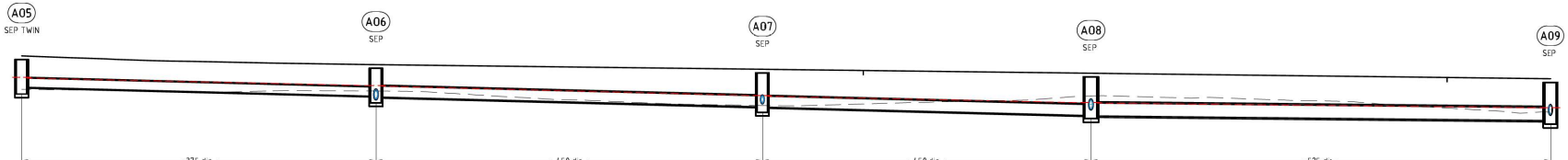
REV No: 0

OPERATIONS



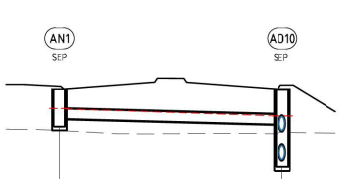
Diameter (mm)		525 dia				525 dia				525 dia			600 dia	
Pipe Grade (%)		0.4%				0.4%				0.4%			0.4%	
Design Flow (Q10 Cumecs)		Q=0.09				Q=0.1				Q=0.1			Q=0.1	
Pipe Velocity (Q10 Flow)		0.44m/s				0.44m/s				0.45m/s			0.35m/s	
DATUM RL	26.00													
HGL 10 YEAR	31.20	31.19			31.05	31.03			31.02	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				31.04				31.85				31.65		31.46
NATURAL SURFACE	31.03				31.43				30.31				30.47		29.62
RUNNING CHAINAGE	5.37				43.37				85.37				125.37		165.37

PROFILE DRAINAGE PIPE A0



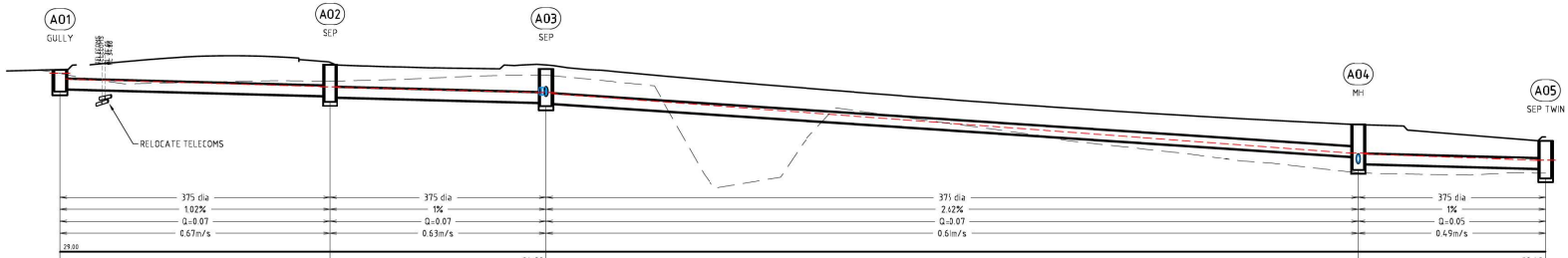
Diameter (mm)		375 dia				450 dia				450 dia			525 dia	
Pipe Grade (%)		1%				1%				1%			0.4%	
Design Flow (Q10 Cumecs)		Q=0.05				Q=0.07				Q=0.09			Q=0.01	
Pipe Velocity (Q10 Flow)		0.48m/s				0.47m/s				0.54m/s			0.43m/s	
DATUM RL	27.00													
HGL 10 YEAR	32.43 32.44	32.41			32.11 32.11	32.09			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 A0



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	31.33	31.32	31.05	31.03
INVERT LEVEL	30.94		30.71	29.42
DEPTH TO INVERT	1.40	1.11	1.31 2.91	2.62
DESIGN SURFACE	32.05		32.04	
NATURAL SURFACE	30.50		30.43	
RUNNING CHAINAGE	-6.93		13.81	

PROFILE DRAINAGE PIPE AN



Diameter (mm)		375 dia				375 dia				375 dia			375 dia	
Pipe Grade (%)		1.02%				1%				2.62%			1%	
Design Flow (Q10 Cumecs)		Q=0.07				Q=0.07				Q=0.07			Q=0.05	
Pipe Velocity (Q10 Flow)		0.67m/s				0.63m/s				0.61m/s			0.49m/s	
DATUM RL	29.00													
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		31.85
RUNNING CHAINAGE	-289.37				-264.03				-243.73				-167.47		-141.47

PROFILE DRAINAGE PIPE A0

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.

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

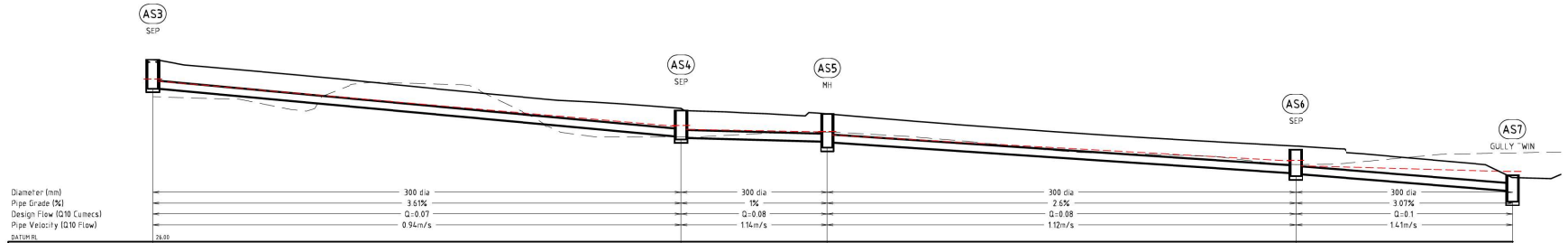
MESSARA AVENUE TO PARK STREET
DUAL CARRIAGEWAY
DRAINAGE PROFILES SHEET 3 OF 7

PROFORM CIVIL ENGINEERING GROUP
www.proformcivil.com

city of swan

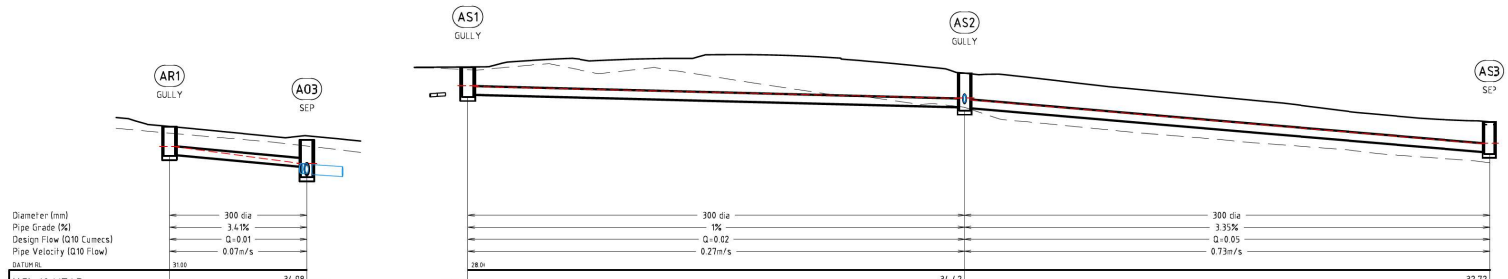
DRAWING No: R771-116
REV No: 0

OPERATIONS



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	100		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	-55.32				-10.53			4.68				53.30			75.81	

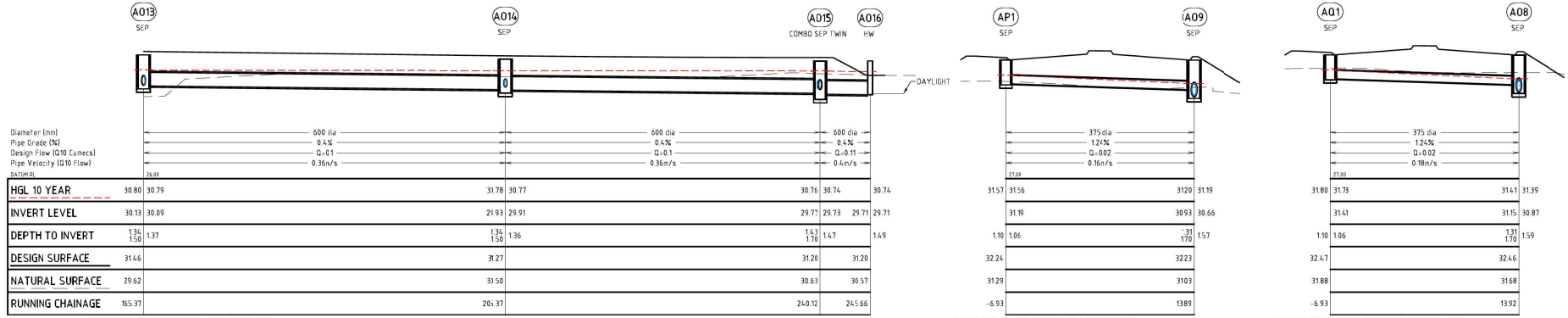
PROFILE DRAINAGE PIPE AS



Diameter (mm)		300 dia				300 dia				300 dia					
Pipe Grade (%)		3.41%				1%				3.35%					
Design Flow (Q10 Cumecs)		Q=0.01				Q=0.02				Q=0.05					
Pipe Velocity (Q10 Flow)		0.07m/s				0.27m/s				0.73m/s					
DATUM RL		31.00				28.01									
HGL 10 YEAR		35.61		34.98 34.99	34.94	34.90	34.37		34.42 34.43	34.37			32.72 32.74		
INVERT LEVEL		35.31		34.87	34.57		34.37		34.10	34.07			32.42		
DEPTH TO INVERT	1.10	1.05		1.00 1.40	1.30	1.10	1.01		1.26 1.40	1.29			1.12 1.20		
DESIGN SURFACE	36.37			35.87		35.57			35.36				33.54		
NATURAL SURFACE	36.12			35.64		35.49			34.09				32.01		
RUNNING CHAINAGE	0.00			12.88		-160.98			-114.46				-65.32		

PROFILE DRAINAGE PIPE AR

PROFILE DRAINAGE PIPE AS



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			31.78	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 1.78	1.47		1.49			
DESIGN SURFACE	31.46				31.27				31.20			31.20			
NATURAL SURFACE	29.62				31.50				30.63			30.57			
RUNNING CHAINAGE	165.37				205.37				240.12			245.66			

PROFILE DRAINAGE PIPE AO

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

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	31.73			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.

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 PROFILES SHEET 4 OF 7

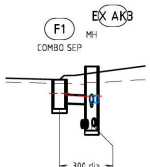
PROFORM CIVIL ENGINEERING GROUP
www.proformcivil.com

city of swan

DRAWING No: R771-117

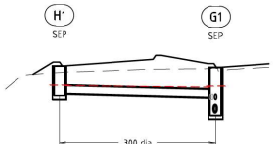
REV No: 0

OPERATIONS



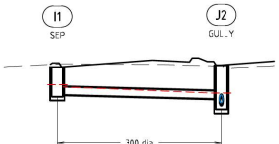
Diameter (mm)		300 dia				
Pipe Grade (%)		1%				
Design Flow (Q10 Cumecs)		Q=0.03				
Pipe Velocity (Q10 Flow)		0.38m/s				
DATUM RL		31.00				
HGL 10 YEAR	35.77	35.70	35.69 35.66	35.45		
INVERT LEVEL		35.40	35.37	35.25		
DEPTH TO INVERT	1.10	0.88	1.40 2.40	1.52		
DESIGN SURFACE	36.28	36.77				
NATURAL SURFACE	36.14	36.18				
RUNNING CHAINAGE	0.00	3.03				

PROFILE DRAINAGE PIPE F



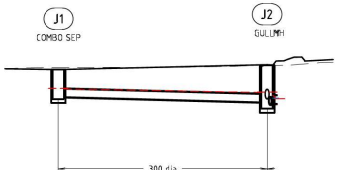
Diameter (mm)		300 dia				
Pipe Grade (%)		1%				
Design Flow (Q10 Cumecs)		Q=0.02				
Pipe Velocity (Q10 Flow)		0.22m/s				
DATUM RL		31.00				
HGL 10 YEAR	35.23	35.20	35.15 35.18	34.87		
INVERT LEVEL		34.90	34.75	34.67		
DEPTH TO INVERT	1.10	1.02	1.11 1.79	1.19		
DESIGN SURFACE	35.92	35.87				
NATURAL SURFACE	35.68	35.84				
RUNNING CHAINAGE	0.00	14.65				

PROFILE DRAINAGE PIPE H



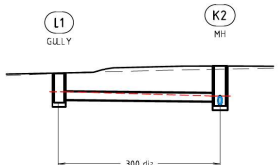
Diameter (mm)		300 dia				
Pipe Grade (%)		1%				
Design Flow (Q10 Cumecs)		Q=0.03				
Pipe Velocity (Q10 Flow)		0.4m/s				
DATUM RL		30.00				
HGL 10 YEAR	34.23	34.15	33.91 33.93	33.80		
INVERT LEVEL		33.85	33.70	33.50		
DEPTH TO INVERT	1.10	1.03	1.24 1.64	1.43		
DESIGN SURFACE	34.88	34.94				
NATURAL SURFACE	34.99	34.92				
RUNNING CHAINAGE	0.00	15.37				

PROFILE DRAINAGE PIPE I



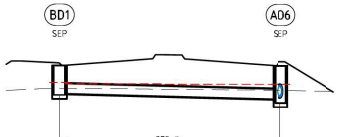
Diameter (mm)		300 dia				
Pipe Grade (%)		1%				
Design Flow (Q10 Cumecs)		Q=0.02				
Pipe Velocity (Q10 Flow)		0.21m/s				
DATUM RL		29.00				
HGL 10 YEAR	34.06	34.04	33.91 33.93	33.80		
INVERT LEVEL		33.74	33.55	33.50		
DEPTH TO INVERT	1.10	1.03	1.39 1.64	1.43		
DESIGN SURFACE	34.77	34.94				
NATURAL SURFACE	34.85	34.92				
RUNNING CHAINAGE	0.00	19.55				

PROFILE DRAINAGE PIPE J



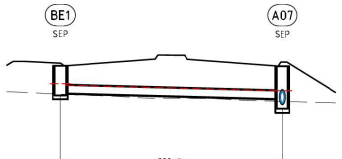
Diameter (mm)		300 dia				
Pipe Grade (%)		0.4%				
Design Flow (Q10 Cumecs)		Q=0.01				
Pipe Velocity (Q10 Flow)		0.1m/s				
DATUM RL		29.00				
HGL 10 YEAR		33.75	33.59	33.57		
INVERT LEVEL		33.45	33.39	33.27		
DEPTH TO INVERT	1.10	0.99	1.32 1.50	1.44		
DESIGN SURFACE	34.44	34.71				
NATURAL SURFACE	34.44	34.59				
RUNNING CHAINAGE	0.00	15.10				

PROFILE DRAINAGE PIPE L



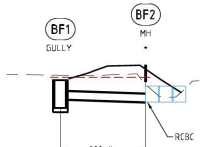
Diameter (mm)		375 dia				
Pipe Grade (%)		1%				
Design Flow (Q10 Cumecs)		Q=0.03				
Pipe Velocity (Q10 Flow)		0.28m/s				
DATUM RL		28.00				
HGL 10 YEAR	32.18	32.14	32.11 32.11	32.09		
INVERT LEVEL		31.76	31.56	31.64		
DEPTH TO INVERT	1.10	1.05	1.25 1.40	1.17		
DESIGN SURFACE	32.82	32.81				
NATURAL SURFACE	31.95	31.88				
RUNNING CHAINAGE	-6.93	13.72				

PROFILE DRAINAGE PIPE BD



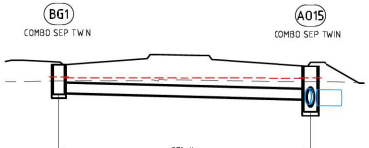
Diameter (mm)		300 dia				
Pipe Grade (%)		1%				
Design Flow (Q10 Cumecs)		Q=0.02				
Pipe Velocity (Q10 Flow)		0.34m/s				
DATUM RL		27.00				
HGL 10 YEAR	31.96	31.90	31.70 31.71	31.67		
INVERT LEVEL		31.60	31.39	31.22		
DEPTH TO INVERT	1.10	1.02	1.23 1.60	1.40		
DESIGN SURFACE	32.63	32.62				
NATURAL SURFACE	31.57	31.30				
RUNNING CHAINAGE	-6.93	13.82				

PROFILE DRAINAGE PIPE BE



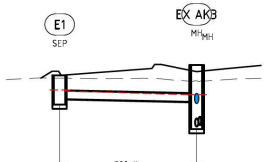
Diameter (mm)		300 dia				
Pipe Grade (%)		1.25%				
Design Flow (Q10 Cumecs)		Q=1.29				
Pipe Velocity (Q10 Flow)		18.21m/s				
DATUM RL		26.00				
HGL 10 YEAR		30.74		30.74		
INVERT LEVEL		29.92	29.82	30.60		
DEPTH TO INVERT	1.05	0.73	1.39	0.60		
DESIGN SURFACE	30.65	31.20				
NATURAL SURFACE	30.83	30.49				
RUNNING CHAINAGE	0.00	8.00				

PROFILE DRAINAGE PIPE BF



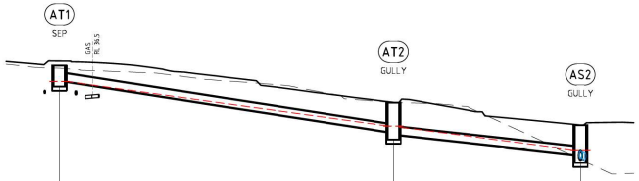
Diameter (mm)		375 dia				
Pipe Grade (%)		%				
Design Flow (Q10 Cumecs)		Q=0.03				
Pipe Velocity (Q10 Flow)		0.2m/s				
DATUM RL		26.00				
HGL 10 YEAR	30.79	30.76		30.74		
INVERT LEVEL		30.20		29.96	29.73	
DEPTH TO INVERT	1.10	1.06		1.23 1.70	1.47	
DESIGN SURFACE	31.26	31.20				
NATURAL SURFACE	30.65	30.63				
RUNNING CHAINAGE	0.00	23.51				

PROFILE DRAINAGE PIPE BG



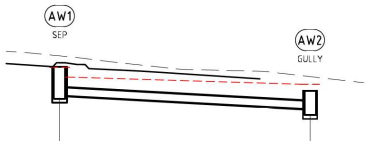
Diameter (mm)		300 dia				
Pipe Grade (%)		0.78%				
Design Flow (Q10 Cumecs)		Q=0.02				
Pipe Velocity (Q10 Flow)		0.28m/s				
DATUM RL		31.00				
HGL 10 YEAR	35.84	35.80	35.65 35.66	35.45		
INVERT LEVEL		35.50	35.40	35.25		
DEPTH TO INVERT	1.10	0.89	1.37 2.40	1.52		
DESIGN SURFACE	36.39	36.77				
NATURAL SURFACE	36.28	36.18				
RUNNING CHAINAGE	0.00	12.85				

PROFILE DRAINAGE PIPE E



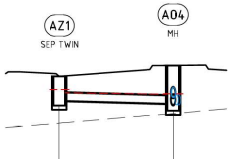
Diameter (mm)		300 dia		300 dia		
Pipe Grade (%)		6.08%		4.21%		
Design Flow (Q10 Cumecs)		Q=0		Q=0.02		
Pipe Velocity (Q10 Flow)		0m/s		0.28m/s		
DATUM RL		31.00				
HGL 10 YEAR		37.01	35.33	35.29	34.42 34.43	34.37
INVERT LEVEL		37.01	35.11	34.99	34.26	34.07
DEPTH TO INVERT	0.80	0.59	1.10 1.40	1.22	1.11 1.40	1.29
DESIGN SURFACE	37.60	16.21			35.36	
NATURAL SURFACE	37.50	16.21			34.09	
RUNNING CHAINAGE	-35.00	-3.74			13.73	

PROFILE DRAINAGE PIPE AT



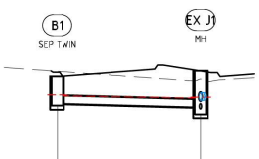
Diameter (mm)		300 dia				
Pipe Grade (%)		2.1%				
Design Flow (Q10 Cumecs)		Q=0.1				
Pipe Velocity (Q10 Flow)		1.49m/s				
DATUM RL		24.00				
HGL 10 YEAR	29.03	28.67			28.39	
INVERT LEVEL		27.97		27.48	27.25	
DEPTH TO INVERT	1.20	1.08		0.67	0.90	
DESIGN SURFACE	29.05	28.15				
NATURAL SURFACE	29.46	28.68				
RUNNING CHAINAGE	0.00	23.48				

PROFILE DRAINAGE PIPE AW



Diameter (mm)		300 dia				
Pipe Grade (%)		1%				
Design Flow (Q10 Cumecs)		Q=0.03				
Pipe Velocity (Q10 Flow)		0.48m/s				
DATUM RL		28.00				
HGL 10 YEAR	32.87	32.75	32.71	32.68		
INVERT LEVEL		32.45	32.35	32.39		
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



Diameter (mm)		300 dia				
Pipe Grade (%)		1%				
Design Flow (Q10 Cumecs)		Q=0.02				
Pipe Velocity (Q10 Flow)		0.27m/s				
DATUM RL		31.00				
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

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.

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.

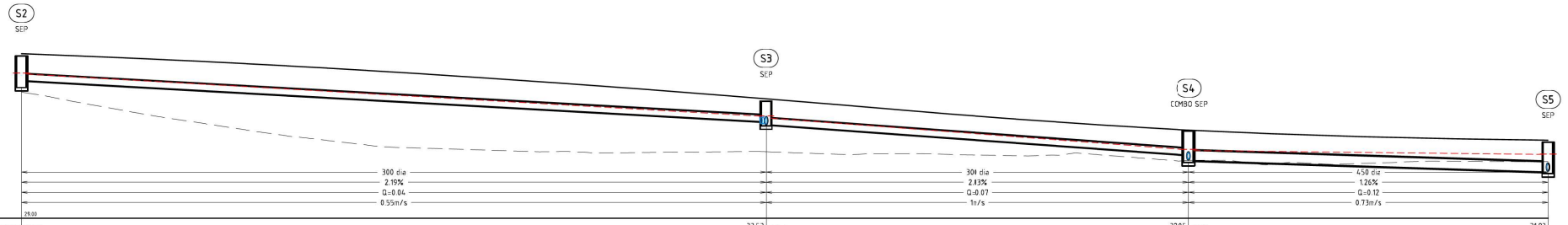
HENLEY BROOK AVE - STAGE 3
MESSARA AVENUE TO PARK STREET
DUAL CARRIAGEWAY
DRAINAGE PROFILES SHEET 5 OF 7

PROFORMCIVIL ENGINEERING GROUP
www.proformcivil.com

city of swan

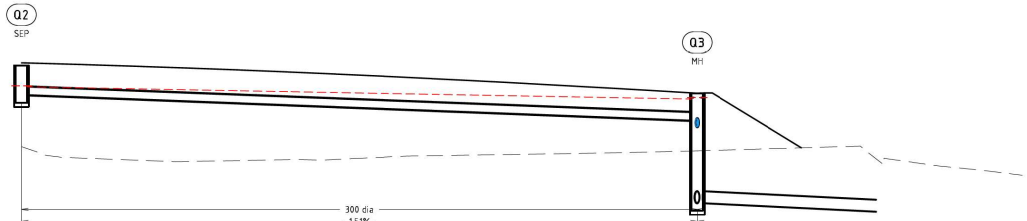
DRAWING No: R771-118
REV No: 0

OPERATIONS



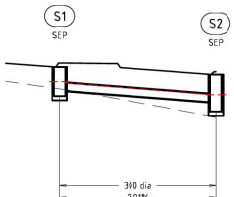
DATUM RL	29.00									
HGL 10 YEAR	35.45	35.40		33.53 33.54	33.44		32.05 32.06	32.01	31.83 31.84	
INVERT LEVEL	35.16	35.10		33.29	33.14		31.82	31.56	31.06	
DEPTH TO INVERT	1.04 1.40	1.10		0.91 1.10	1.06		1.06 1.40	1.32	1.40	1.32
DESIGN SURFACE	36.20			34.20			32.88		32.38	
NATURAL SURFACE	34.60			31.96			31.57		31.52	
RUNNING CHAINAGE	-45.87			36.80			83.74		123.65	

PROFILE DRAINAGE PIPE S



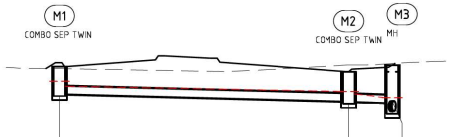
DATUM RL	29.00				
HGL 10 YEAR	35.67	35.63		35.18 35.23	34.96
INVERT LEVEL	35.39	35.33		34.38	31.28
DEPTH TO INVERT	1.04 1.40	1.10		1.02 4.40	4.12
DESIGN SURFACE	36.43			35.40	
NATURAL SURFACE	33.40			33.24	
RUNNING CHAINAGE	14.37			77.60	

PROFILE DRAINAGE PIPE Q



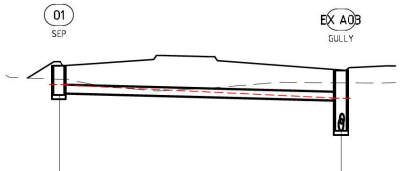
DATUM RL	30.00			
	35.92	35.85	35.45	
		35.55	35.16	
	1.10	0.89	1.04 1.40	
	36.48		36.20	
	35.66		34.60	
	-60.49		-45.87	

PROFILE DRAINAGE PIPE S



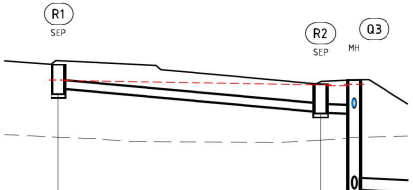
DATUM RL	29.00				
HGL 10 YEAR	33.35	33.18	32.98	32.89	32.74
INVERT LEVEL	32.88	32.61	32.59	32.55	32.14
DEPTH TO INVERT	1.10	1.03	1.11 1.20	1.13	1.42 1.83
DESIGN SURFACE	33.91		33.71		33.97
NATURAL SURFACE	33.83		33.97		34.02
RUNNING CHAINAGE	0.00		27.04		31.15

PROFILE DRAINAGE PIPE M



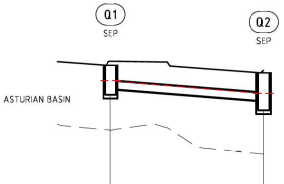
DATUM RL	28.00			
	33.51	33.49		33.01
		33.19	32.92	31.77
	1.10	1.03	1.12	2.27
	34.22		34.04	
	33.71		33.57	
	0.00		26.43	

PROFILE DRAINAGE PIPE O



DATUM RL	29.00				
	35.39	35.37	35.21	35.18 35.23	34.96
		35.07	34.22	34.17 34.14	31.28
	1.10	0.89	1.02 1.10	1.06 1.25 4.40	4.12
	35.96		35.24	35.40	
	33.25		33.14	33.24	
	0.00		24.55	27.67	

PROFILE DRAINAGE PIPE P



DATUM RL	30.00			
	36.15	36.12	35.67	
		35.82	35.39	
	1.10	0.90	1.04 1.40	
	36.72		36.43	
	34.29		33.40	
	0.00		27.40	

PROFILE DRAINAGE PIPE Q

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 WORKS AND A DBYD ENQUIRY SHALL BE LODGED 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.

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 PROFILES SHEET 6 OF 7

PROFORM CIVIL
ENGINEERING GROUP
www.proformcivil.com

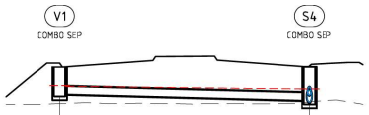
city of swan

DRAWING No: R771-119

REV No: 0

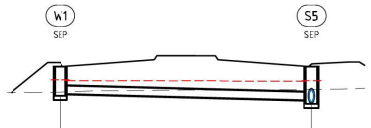
OPERATIONS

DIAL BEFORE YOU DIG www.1100.com.au



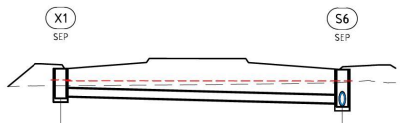
Diameter (mm)		300 dia				
Pipe Grade (%)		1%				
Design Flow (Q10 Cumecs)		Q=0.02				
Pipe Velocity (Q10 Flow)		0.22m/s				
DATUM RL	28.00					
HGL 10 YEAR	32.18	32.15		32.09 32.08	32.41	
INVERT LEVEL		31.85		31.62	31.16	
DEPTH TO INVERT	1.10	1.02		1.26 1.40	1.32	
DESIGN SURFACE	32.87			32.88		
NATURAL SURFACE	31.50			31.57		
RUNNING CHAINAGE	0.00			23.35		

PROFILE DRAINAGE PIPE V



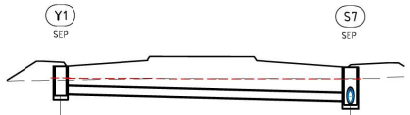
Diameter (mm)		300 dia				
Pipe Grade (%)		1%				
Design Flow (Q10 Cumecs)		Q=0.02				
Pipe Velocity (Q10 Flow)		0.27m/s				
DATUM RL	27.00					
HGL 10 YEAR	31.88	31.84		31.83 31.84	31.77	
INVERT LEVEL		31.36		31.12	31.06	
DEPTH TO INVERT	1.10	1.02		1.26 1.40	1.32	
DESIGN SURFACE	32.38			32.38		
NATURAL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

PROFILE DRAINAGE PIPE W



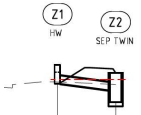
Diameter (mm)		300 dia				
Pipe Grade (%)		1%				
Design Flow (Q10 Cumecs)		Q=0.02				
Pipe Velocity (Q10 Flow)		0.32m/s				
DATUM RL	27.00					
HGL 10 YEAR	31.70	31.66		31.65 31.66	31.56	
INVERT LEVEL		31.08		30.82	30.76	
DEPTH TO INVERT	1.10	1.03		1.27 1.40	1.33	
DESIGN SURFACE	32.11			32.08		
NATURAL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

PROFILE DRAINAGE PIPE X



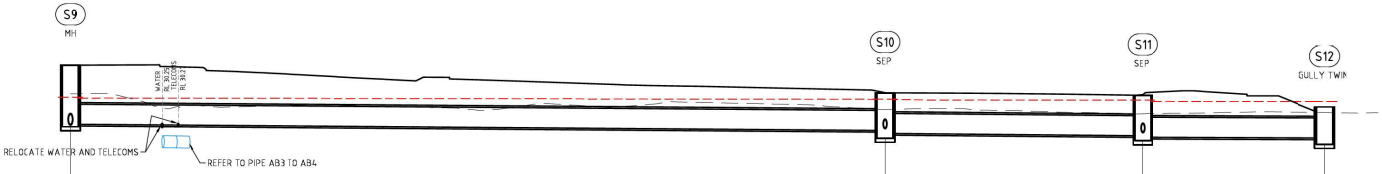
Diameter (mm)		300 dia				
Pipe Grade (%)		1%				
Design Flow (Q10 Cumecs)		Q=0.0				
Pipe Velocity (Q10 Flow)		0.26m/s				
DATUM RL	27.10					
HGL 10 YEAR	31.46	31.44		31.43 31.43	31.38	
INVERT LEVEL		30.87		30.60	30.54	
DEPTH TO INVERT	1.10	1.03		1.26 1.40	1.32	
DESIGN SURFACE	31.90			31.86		
NATURAL SURFACE	31.37			31.44		
RUNNING CHAINAGE	0.00			27.12		

PROFILE DRAINAGE PIPE Y



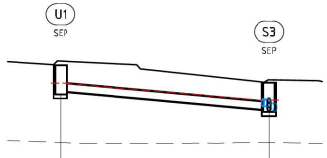
Diameter (mm)		300 dia				
Pipe Grade (%)		4.57%				
Design Flow (Q10 Cumecs)		Q=0				
Pipe Velocity (Q10 Flow)		0m/s				
DATUM RL	27.00					
HGL 10 YEAR		31.40	31.40			
INVERT LEVEL		31.25	31.00			
DEPTH TO INVERT		0.70	0.66 1.10			
DESIGN SURFACE			31.66			
NATURAL SURFACE		31.32	31.22			
RUNNING CHAINAGE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

PROFILE DRAINAGE PIPE Z



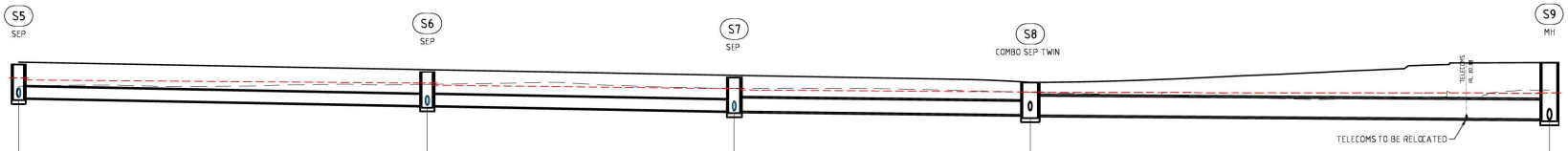
Diameter (mm)		750 dia			750 dia		750 dia	
Pipe Grade (%)		0.3%			0.34%		0.15%	
Design Flow (Q10 Cumecs)		Q=0.29			Q=0.28		Q=0.28	
Pipe Velocity (Q10 Flow)		0.67m/s			0.64m/s		0.63m/s	
DATUM RL	26.00							
HGL 10 YEAR	31.25 31.26	31.22		31.17	31.15	31.14 31.15	31.10	31.09
INVERT LEVEL	30.24	30.24		30.01	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



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	33.33 33.54	33.44
INVERT LEVEL		33.86	33.18	33.14
DEPTH TO INVERT	1.10	4.99	1.22 1.10	1.06
DESIGN SURFACE	34.85		34.20	
NATURAL SURFACE	31.96		31.36	
RUNNING CHAINAGE	0.00		19.50	

PROFILE DRAINAGE PIPE U



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
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.

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 PROFILES SHEET 7 OF 7

PROFORMCIVIL ENGINEERING GROUP www.proformcivil.com

city of swan

DRAWING No: R771-120
REV No: 0

OPERATIONS

DIAL BEFORE YOU DIG www.1100.com.au

PIT SCHEDULE

NAME	TYPE	EASTING	NORTHING	SETOUT RL	DIAMETER	DEPTH	REMARKS
A1	SEP	65368.86	2804.99.476	36.156	1.05	1.75	CONVERT SEP
A81	HW	65486.156	279492.43	30.616	0.5	1.02	
A82	GULLY	654.92.203	279489.748	31.665	1.05	1.4	
A83	MH	65514.087	279474.464	32.374	1.05	3.2	
A84	MH	65517.332	279468.574	32.387	1.05	3.2	
A85	GULLY	65544.371	279418.431	31.535	1.05	1.1	
A01	GULLY	65571.331	279487.817	31.77"	1.05	0.91	
A02	GULLY	65570.945	279473.871	31.836	1.05	1.4	
A^1	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	654.72.953	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	31.464	1.05	1.4	
A..1	SEP	65506.051	279240.309	31.66	1.05	1.4	
AM1	HW	654.93.629	279181.576	30.364	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	
AC12	SEP	65525.999	279238.867	31.658	1.2	1.7	
AO13	SEP	65529.22	279278.74	31.465	1.2	1.5	
AC14	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	654.82.526	278859.155	36.031	1.05	1.4	
AO3	SEP	654.95.393	278874.71	35.864	1.05	1.4	
AO4	MH	654.96.554	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	654.97.699	279120.401	32.241	1.05	1.1	
AQ1	SEP	654.94.469	279074.033	32.465	1.05	1.1	
AR1	GULLY	654.97.64	278862.009	36.365	1.05	1.1	
AS1	GULLY	654.68.096	278821.876	35.571	1.05	1.1	
AS2	GULLY	65502.028	278789.94	35.361	1.05	1.4	
AS3	SEP	65515.674	278742.752	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	
A^2	GULLY	65514.312	278802.333	36.21'	1.05	1.4	
AW1	SEP	65615.778	278597.47	29.053	1.05	1.2	
AW2	GULLY	65639.587	278596.659	28.15	1.05	0.9	
AZ1	SEP TWIN	654.85.949	278951.692	33.368	1.05	1.1	
B1	SEP TWIN	653.81.444	280449.664	36.371	1.05	1.1	
B81	COMBO SEP	654.08.878	280240.858	35.427	1.05	1.1	ADJUST LID
BC1	SEP	654.22.383	280246.134	35.434	1.05	1.46	CONVERT LID TO SEP
BD1	SEP	654.89.423	279001.586	32.816	1.05	1.1	
BE1	SEP	654.92.154	279040.865	32.624	1.05	1.1	
BF1	GULLY	654.90.552	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 AO3	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	28014.6.51	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	279480.433	32.448	1.5	2.3	
U1	SEP	65551.573	279728.336	34.855	1.05	1.1	
V1	COMBO SEP	65555.879	279657.828	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	279528.115	31.656	1.05	1.1	

PIPE SCHEDULE

NAME	DIAMETER	LENGTH	U/S IL	D/S IL	SLOPE(1in)	SLOPE(%)	CLASS
BF1 to BF2	300	8	29.924	29.824	-80	1.25	HDPE SN8
AO1 to AO2	300	12.97	34.768	30.638	-100	1	RCP 4
AF1 to S10	300	23.33	34.337	30.104	-100	1	RCP 4
AG1 to S11	300	25.71	34.209	29.952	-100	1	RCP 4
AJ1 to AI5	300	20.08	34.277	30.077	-100	1	RCP 4
AR1 to AO3	300	12.88	35.312	34.813	-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	32.442	-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	28.817	-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	34.216	-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	35.21	-100	1	RCP 4
BE1 to AO7	300	20.75	31.601	31.394	-100	1	RCP 4
C1 toEx J1	300	4.71	35.512	35.465	-100	1	RCP 4
D1 to D2	300	6.91	36.042	35.913	-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	34.715	-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	33.353	-250.2	0.4	RCP 4
M1 to M2	300	27.04	32.877	32.666	-100	1	RCP 4
M2 to M3	300	4.11	32.586	32.545	-100	1	RCP 4
O1 to Ex A03	300	26.43	31.189	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 A04	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	33.269	-45.6	2.19	RCP 4
S3 to S4	300	46.94	31.144	31.85	-35.3	2.83	RCP 4
U1 to S3	300	19.5	31.863	33.186	-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	31.873	30.642	-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	31.714	30.555	-200	0.5	RCP 4
AO2 to S9	375	54.63	34.573	30.236	-162.3	0.62	RCP 4
AI1 to AI2	375	20.79	34.748	30.54	-100	1	RCP 4
AK1 to AI4	375	20.77	34.364	30.156	-100	1	RCP 4
AL1 to AI3	375	20.72	34.558	30.351	-100	1	RCP 4
AN1 to AO10	375	20.82	34.941	30.733	-100	1	RCP 4
AO1 to AO2	375	25.34	33.115	34.857	-98.3	1.02	RCP 4
AO2 to AO3	375	20.29	34.807	34.664	-100	1	RCP 4
AO3 to AO4	375	76.27	34.569	32.513	-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	31.616	30.449	-52.6	1.9	RCP 4
AB2 to AB3	450	26.62	34.489	30.218	-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 AC9	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 AC13	600	40	30.286	30.126	-250	0.4	RCP 4
AO13 to AC14	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 AC16	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)x600	66.01	29.88	29.68	-330	0.3	RCB

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.

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

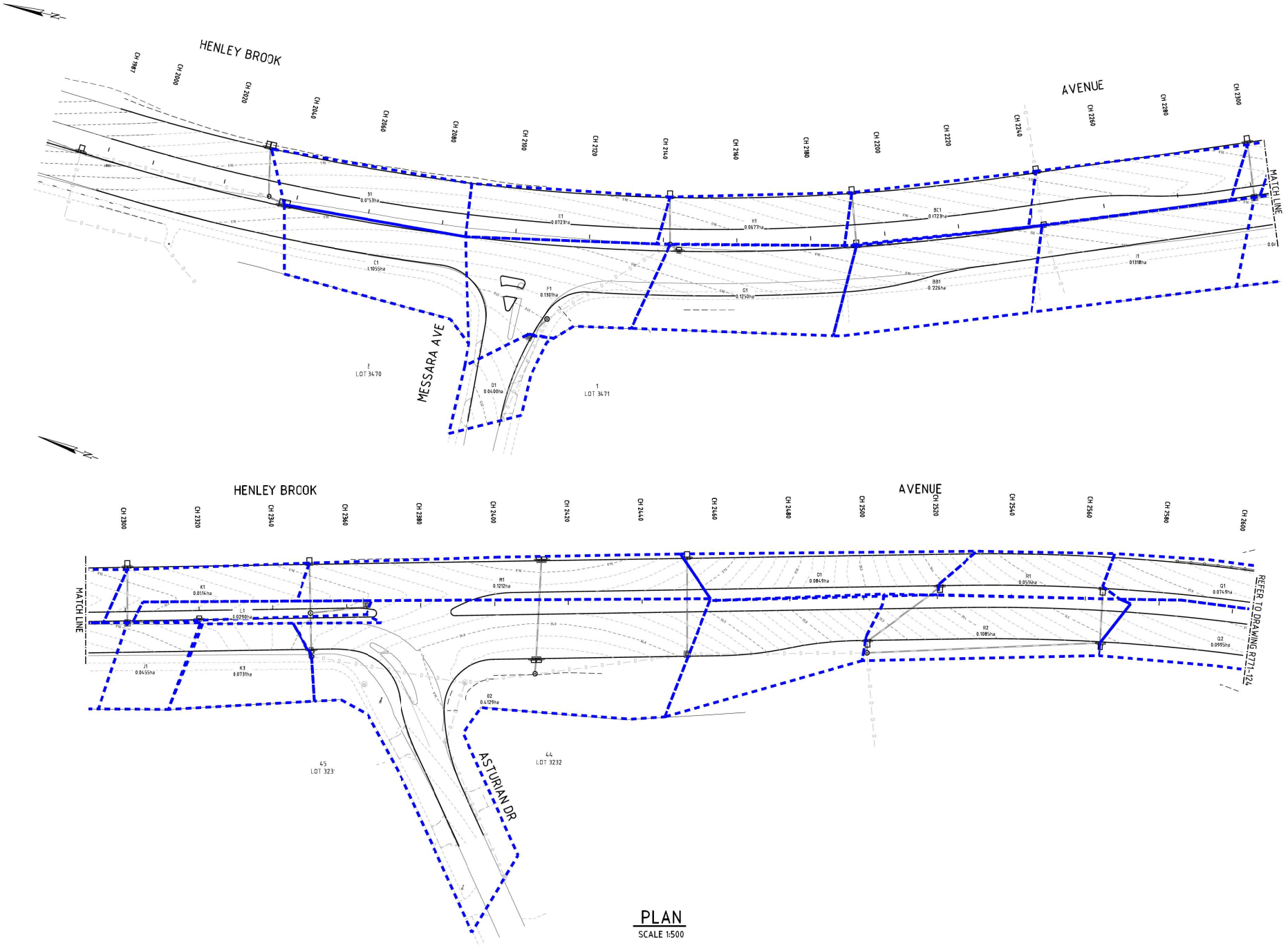
PROFORMCIVIL ENGINEERING GROUP www.proformcivil.com

city of swan

DRAWING No: R771-121

REV No: 0

OPERATIONS



PLAN
SCALE 1:500

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.

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

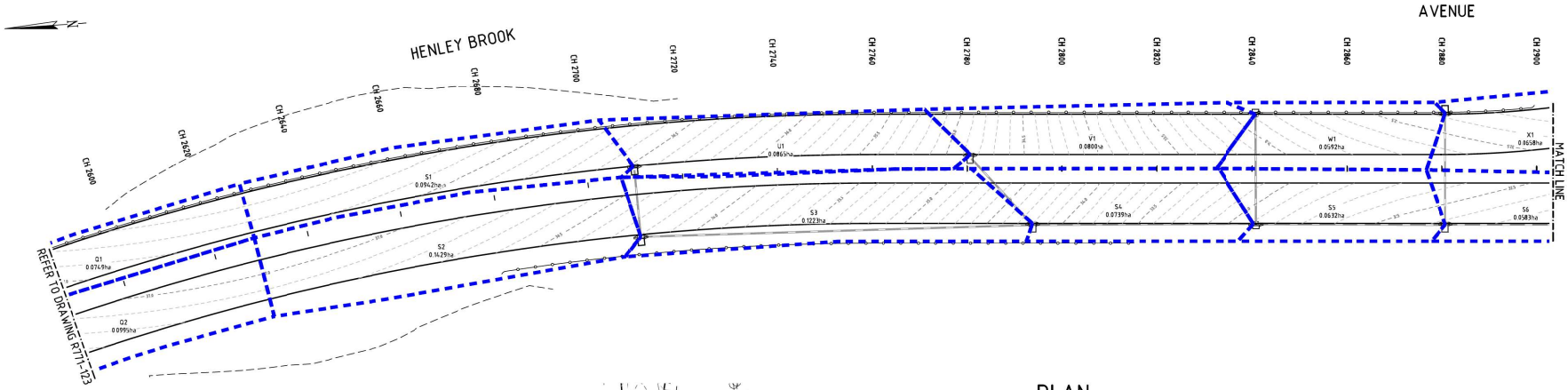
HENLEY BROOK AVE - STAGE 3
MESSARA AVENUE TO PARK STREET
DUAL CARRIAGEWAY
DRAINAGE CATCHMENT PLAN SHEET 1 OF 4

PROFORMCIVIL ENGINEERING GROUP
www.proformcivil.com

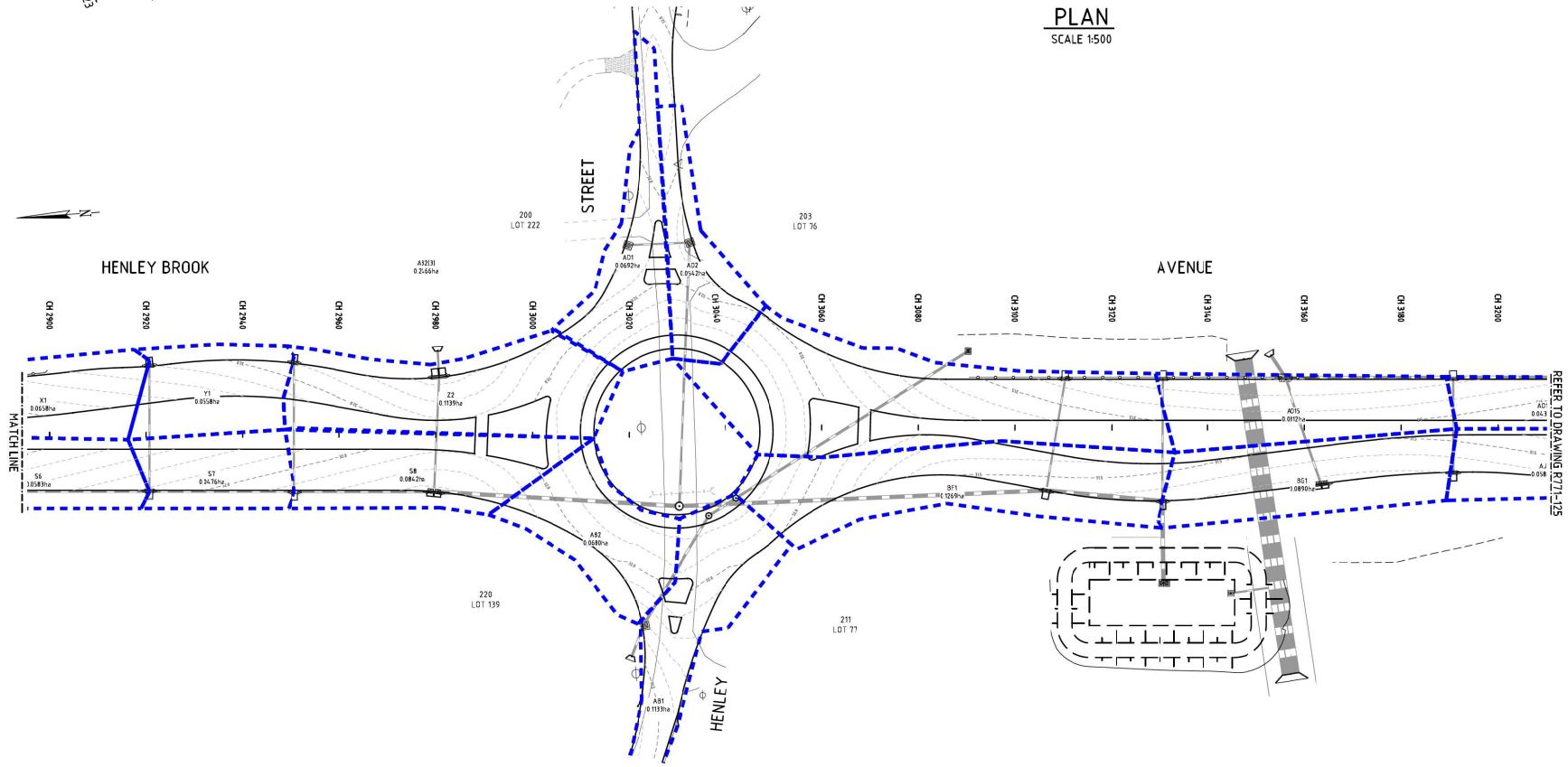
city of swan

DRAWING No: R771-122
REV No: 0

OPERATIONS



PLAN
SCALE 1:500



PLAN
SCALE 1:500

1 : 500

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.

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: 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

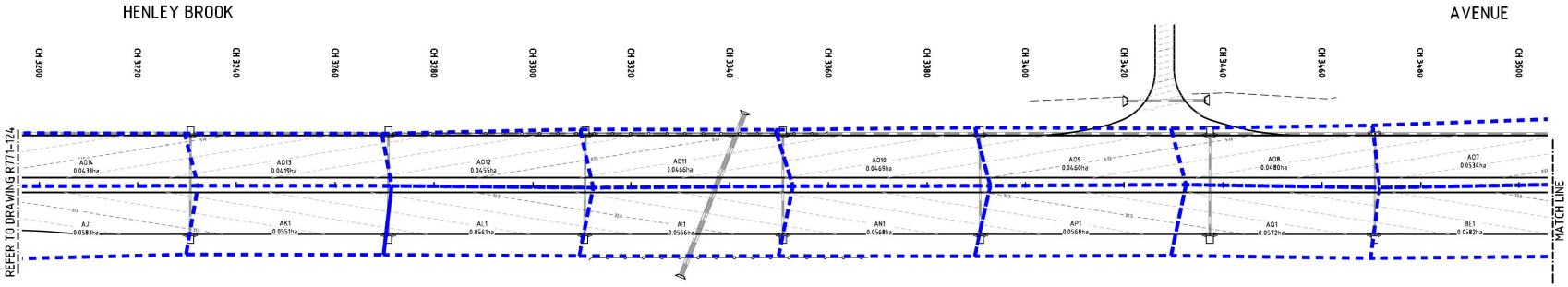
PROFORMCIVIL ENGINEERING GROUP
www.proformcivil.com

city of swan

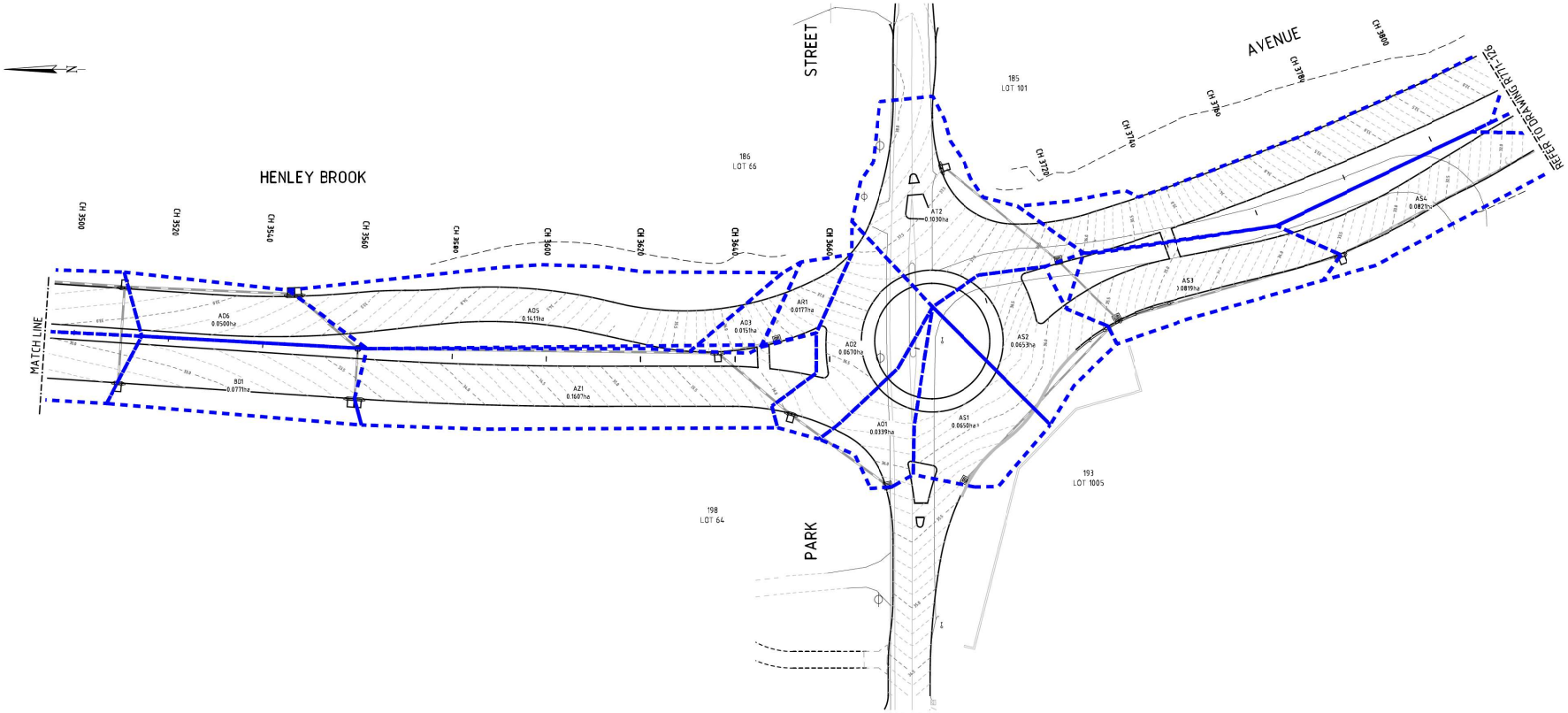
DRAWING No: R771-123

REV No: 0

OPERATIONS



PLAN
SCALE 1:500



PLAN
SCALE 1:500

0 5 10 12.5 15 20m
1 : 500

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.

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: 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

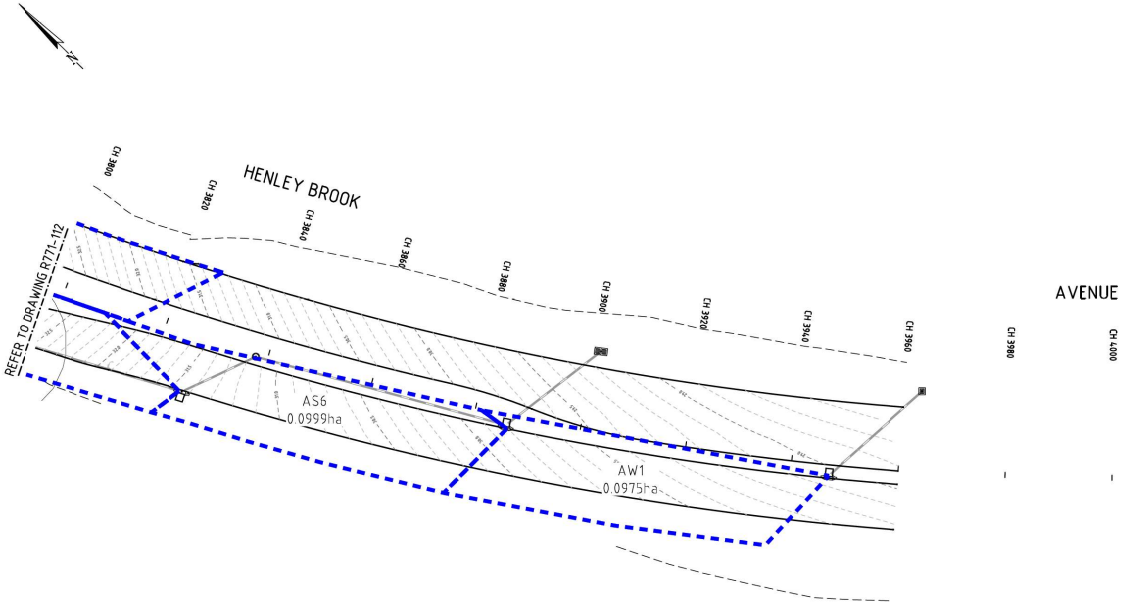
PROFORMCIVIL
ENGINEERING GROUP
www.proformcivil.com

city of swan

DRAWING No: R771-124

REV No: 0

OPERATIONS



0 5 10 12.5 15 20m
1 : 500

PLAN
SCALE 1:500

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.

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: 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

PROFORMCIVIL ENGINEERING GROUP
www.proformcivil.com

city of swan

DRAWING No: R771-125
REV No: 0

OPERATIONS

HYDRAULICS Q10 (10% 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=CA	Catchment Flow Q:	Direct Flow Qdg	Approach Flow Qa	Road Capacity	Flooded Depth	Flooded Width	Flooded Vel.Jep	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)	(m)	(m)	(sq.m/s)	(%)	(%)	(m)	(-)	(-)	(L/s)	(L/s)	(-)
A1	SEP	65368.86	7804.99.42	36.16	36.16	36.16																	0											0		-
A2	MH	65371.15	7805.02.61	36.16	36.06	36.06																														-
AB1	HW	65486.16	7794.92.43	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	7794.89.75	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	7794.74.46	32.37	32.37	32.37																														-
AB4	MH	65517.33	7794.68.57	32.39	32.39	32.39																														-
AB5	GULLY	65544.37	7794.18.43	31.54	31.54	30.55																														-
AD1	GULLY	65571.33	7794.87.82	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	7794.73.87	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	7793398.8	31.35	31.35	31.35																		0					0.8	2.6		1	1G,1.5X	0		AG1
AG1	SEP	65535.73	7793378.53	31.24	31.24	31.24																		0					0.4	3		1	0.5G,3.0X	0		AG15
AH1	HW Triple	65472.95	7793356.43	29.88	33	30.88																														-
AH2	HW outlet Triple	65538.75	7793361.72	29.68	31.2	30.68																														-
AJ1	SEP	65502.9	7792.00.58	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	0.12	0.5	3		1	0.5G,3.0X	16.7	0.4	AL1
AJ1	SEP	65512.36	7793319.99	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	0.12	0.4	3		1	0.5G,1.5X	15.5	2	BG1
AK1	SEP	65508.83	7792.80.22	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	0.12	0.5	3		1	0.5G,3.0X	16.3	0.3	AJ1
AL1	SEP	65506.05	7792.40.31	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	0.12	0.5	3		1	0.5G,3.0X	16.5	0.4	AK1
AM1	HW Double	65493.63	7791.81.58	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	7791.66.53	30.17	30.95	30.95																														-
AN1	SEP	65500.49	7791.60.43	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	0.12	0.5	3		1	0.5G,3.0X	16.9	0.5	AI1
AO1	GULLY	65467.16	7788839.28	35.83	35.83	35.83	1I	Direct				5	117.65	0.9	0.0339	0.0305	11.8964	1420.2	0.0305	1.3748	612.7	1420.2		1420.2	1579.1	0.146	3.96	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	7788859.15	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	0.12	2.7	1.9		1	2G,1.5X	13.9	5.8	AZ1
AO3	SEP	65495.39	7788874.71	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	0.11	3.9	1		1	4G,0.5X	3.6	0.9	LOST
AO4	MH	65496.55	7788950.97	33.78	33.78	33.78																														-
AO5	SEP TWIN	65507.66	7788964.22	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	0.14	1.5	3		1	2G,3.0X	29.6	11.9	AO6
AO6	SEP	65509.37	7790000.2	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	0.13	0.6	3		1	0.5G,3.0X	23	3.6	AO7
AO7	SEP	65512.51	7790139.32	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	0.12	0.5	3		1	0.5G,3.0X	18.5	0.9	AO8
AO8	SEP	65514.42	7790172.59	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	0.12	0.5	3		1	0.5G,3.0X	15		AO9
AO9	SEP	65517.66	7791119.16	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	0.12	0.5	3		1	0.5G,3.0X	13.5		AO10
AO10	SEP	65520.44	7791159.06	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	0.12	0.5	3		1	0.5G,3.0X	13.8		AO11
AO11	SEP	65523.22	7791198.96	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	0.12	0.5	3		1	0.5G,3.0X	13.7		AO12
AO12	SEP	65526	7792238.87	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	0.12	0.5	3		1	0.5G,3.0X	13.4		AO13
AO13	SEP	65529.22	7792278.74	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	0.12	0.5	3		1	0.5G,3.0X	12.3		AO14
AO14	SEP	65531.56	7793318.67	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	0.12	0.5	3		1	0.5G,3.0X	12.7		AO15
AO15	COMBO SEP TWIN	65533.97	7793353.34	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	7793355.93	29.7	31.2	31.2																														-
AP1	SEP	65497.7	7791120.4	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	0.12	0.5	3		1	0.5G,3.0X	17.5	0.6	AN1
AQ1	SEP	65494.47	7790174.03	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	0.12	0.5	3		1	0.5G,3.0X	19.6	1.4	AP1
AR1	GULLY	65497.64	7788862.01	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	3.89	0.11	3.9	2.3		1	4G,1.5X	5.1	0.1	AO3
AS1	GULLY	65468.1	7788821.88	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	7787189.94	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	0.13	3.9	2.8		1	4G,1.5X	13.7	5.5	AS3
AS3	SEP	65515.67	7787421.79	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	0.14	3.7	3.1		1	4G,3.0X	17.9	11.8	AS4
AS4	SEP	65541.56	7786941.49	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	0.13	3	1.5		1	2G,1.5X	18.8	17.1	AS6
AS5	MH	65555.9	7786894.3	31.3	31.3	31.3																														-
AS6	SEP	65579.52	7786461.89	29.81	29.81	29.81	1I	Direct				5	117.65	0.9	0.0999	0.0899	0.0859	29.4	0.0899	0.0899	29.4	29.4		46.5	633.5	0.055	1.92	0.15	2.1	3		1	2G,3.0X	26	20.6	AW1
AS7	GULLY TWIN	65602.37	7786444.4	28.76	28.76	28.76																														-
AT1	SEP	65534.28	7788827.3	37.6	37.6	37.6																		0					2.5	3		1	2G,1.5X	0		LOST
AT2	GULLY	65514.31	7788802.33	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	1.72	0.19	4.2	2.6		1	4G,1.5X	20.1	10.2	LOST
AW1	SEP	65615.78	7785197.47	29.05	29.05	29.05	1I	Direct				5	117.65	0.9	0.0975	0.0878	32.9995	1032.9	0.0878	0.7521	2458	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	7785196.7	28.15	28.15	28.15																														-
AZ1	SEP TWIN	65485.95	7785951.69	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	0.15	2	3		1	2G,3.0X	34.2	18.9	BD1
B1	SEP TWIN	65381.44	7804.49.66	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	0.13	0.8	3		1	1G,1.5X	19.1	3.1	LOST
BB1	COMBO SEP	65408.88	7802.40.86	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	0.15	0.9	3		0.61	1G,3.0X	21.5	33.2	J2
BB2	MH	65409.58	7802.42.28	35.69	35.69	35.69																														-
BC1	SEP	65422.38	7802.46.13	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	0.13	1	3		1	1G,3.0X	21.3	5.8	I1
BC2	MH	65423.87	7802.47.73	35.44	35.44	35.44																														-
BD1	SEP	65489.42	7790015.59	32.82	32.82	32.82	1I	Direct				5	117.65	0.9	0.0771	0.0694	0.0654	22.7	0.0694	0.0694	22.7	22.7		41.5	482.9	0.069	2.49	0.13	0.5	3		1	0.5G,3.0X	30.6	10.9	BE1
BE1	SEP	65492.15	7790040.81	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	0.13	0.5	3		1	0.5G,3.0X	23.8	4.2	AQ1
BF1	GULLY	65490.55	7793367.73	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	7793359.76	30.6	31.86	31.2																														-
BG1	COMBO SEP TWIN	65511.88	7793347.43	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	7804.42.53	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	0.13	0.8	3		1	1G,3.0X	27.6	3.4	LOST
Ex J1	MH	65368.75	7804.47.07	36.77	36.57	36.57																														-
D1	GULLY	65347.56	7803694	37.08	37.08	37.08	1I	Direct				5	117.65	0.9	0.04	0.036	0.035	11.8	0.036	0.036	11.8	11.8		11.8	238.5	0.021	2.96	0.11	1.3	1		1	1G,0.5X	6.7	5.1	LOST
D2	MH	65353.57	7803663.23	37.08	37.08	37.08																														-
E1	SEP	65393.2	7803412.6	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	0.12	0.7	3		1	0.5G,3.0X	19.8	1.5	H1
Ex Ak3	MH	65380.84	7803338.34	36.77	36.77	36.77																														-
F1	COMBO SEP	65379.58	7803335.58	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	0.14	0.9	3.5		1	1G,3.0X	27	11.3	G1
G1	SEP	65391.73	7802289.01	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	0.14	0.9	3.5		1	1G,3.0X	29.4	18.6	BB1
G2	MH	65391.42	7802290.03	35.87	35.87	35.87																														-
H1	SEP	65405.51	7802293.54	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	0.13	1	3		1	1G,1.5X	15.6	5.8	BC1
I1	SEP	65443.4	7801926.46	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	0.14	1	3		1	1G,3.0X	28.4	16.2	K1
J1	COMBO SEP	65436.92	7801069.22	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	0.12	0.9	2.2		1	1G,1.5X	15.1	7.6	LOST
J2	GULLY	65429.8	7801874.3	34.94	34.94	34.94																		33.2	2584.7	0.057	2.01	0.13	0.9	3		1	1G,3.0X	23.9	9.3	J1
K1	SEP	65461.39	7801146.51	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	0.13	1	3		1	1G,3.0X	23.5	7.8	M1
K2	MH	65449.14	7801141.65	34.71	34.71	34.71																														-
K3	COMBO SEP	65440.01	7801138.03	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	0.11	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	0.11	1.1	2		1	1G,1.5X	6.8	1.7	LOST
M1	COMBO SEP TWIN	65484.27	7800888.05	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	7800880.13	33.71	33.71	33.71																		28.8	1540.7	0.076	2.74	0.12	0.1	3		1	0.5G,3.0X	28.8		LOST
M3	MH	65454.96	7800879.02	33.71	33.71	33.97																														-
N1	HW	65521.81	7790975.98	31	31.86	31.86																		0										0		-
N2	HW outlet	65522.52	7790888.07	30.93	31.79	31.79																														-
O1	SEP	65498.65	7800851.33	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	0.13	2	2.6		1	2G,1.5X	15.5	9.5	LOST
R1	SEP	65515.67	7799984.54	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	0.12	2.1	2		1	2G,1.5X	13.6	5.4	LOST
R2	SEP	65494.91	7799997.78	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	0.15	2.4	3		1	2G,3.0X	24.7	17.7	M2
Q1	SEP	65530.46	7799942.86	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	0.13	1.2	3		1	1G,3.0X	18.2	3.8	R1
Q2	SEP	65516.35	7799938.44	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	0.13	1.2	3		1	1G,1.5X	18.7	10.6	R2
Q3	MH	65491.73	7799996.69	35.23	35.23	35.4																														-
Q5	MH	65469.14	7799984.94	35.28	35.28	33																														-
S1	SEP	65554.08	7799799.17	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	0.13	1.6	3		1	2G,3.0X	19.1	8.6	U1

DIAL BEFORE YOU DIG www.1100.com.au

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.

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 HYDRAULICS Q10

PROFORMCIVIL ENGINEERING GROUP www.proformcivil.com

city of swan

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	Foad	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	Xfal	Depth	Factor	Curve Name	Flow Qg	Flow Qb	Node
(-)	(-)	(m)	(n)	(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	65361.86	280459.42	36.16	36.16	36.16																		0										0		-
A2	MH	65371.15	280542.61	36.16	36.06	36.06																														-
AB1	HW	65486.16	279452.43	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	16.9029	6.7612			0.103																				
AB2	GULLY	65412.2	279449.75	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	3011		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			0.0133																				
AB3	MH	65514.09	279474.46	32.37	32.37	32.37																														-
AB4	MH	65511.33	279448.57	32.39	32.39	32.39																														-
AB5	GULLY	65541.37	279478.43	31.54	31.54	30.55																														-
AD1	GULLY	65571.33	279437.82	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	197	0.044					0.3	1		20.4		LOST
AD2	GULLY	65571.94	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	197	0.018					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		A015
AH1	HW Triple	65472.95	279316.43	29.88	33	30.88																														-
AH2	HW outlet Triple	65533.75	279341.72	29.68	31.2	30.68																														-
AI1	SEP	65552.9	279260.58	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	AI.1
AJ1	SEP	65511.36	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	0.012	1.9	0.02	0.4	3		1	0.5G,1.5X	15.5	2	BG1
AK1	SEP	65501.83	279260.22	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	65505.05	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	65491.63	279161.58	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	65521.35	279166.53	30.17	30.95	30.95																														-
AN1	SEP	65504.49	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	278819.28	35.83	35.83	35.83	1I	Direct				5	117.65	0.9	0.0339	0.0305	11.8964	14.20.2	0.0305	1.8748	612.7	14.20.2		4.20.2	1579.1	0.146	5.96	0.36	3.2	1		1	4G,0.5X	74	134.6.2	LOST
							3P	Kinematic Wave	100	2.5	0.25	32.17	42.98	0.4	29.6648	11.8659			1.8443																				
AO2	SEP	65487.53	278819.15	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	0.012	1.74	0.02	2.7	1.9		1	2G,1.5X	13.9	5.8	AZ1
AO3	SEP	65491.39	278814.71	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	3148.7	0.014	1.53	0.01	3.9	1		1	4G,0.5X	3.6	0.9	LOST
AO4	MH	65491.55	278850.97	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	0.016	1.95	0.04	1.5	3		1	2G,3.0X	29.6	11.9	AO6
AO6	SEP	65501.37	279020.2	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	0.019	2.06	0.03	0.6	3		1	0.5G,3.0X	23	3.6	AO7
AO7	SEP	65511.51	279019.32	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	0.012	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	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	65511.66	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		A010
A010	SEP	65524.44	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		A011
A011	SEP	65523.22	279158.96	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		A012
A012	SEP	65526	279218.87	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		A013
A013	SEP	65521.22	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		A014
A014	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		A015
A015	COMBO SEP TWIN	65533.97	279313.34	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	16.8	0.016					0.045	1		23.9		-
A016	HW outlet	65519.1	279315.93	29.7	31.2	31.2																														-
AP1	SEP	65467.7	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	0.043	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	1568.9	0.02	0.89	0.01	3.9	2.3		1	4G,1.5X	5.1	0.1	AO3
AS1	GULLY	65468.1	278811.88	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	65501.03	278769.94	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	7473.4	0.015	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	65504.56	278656.49	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	2194.8	0.014	2.73	0.03	3	1.5		1	2G,1.5X	18.8	17.1	AS6
AS5	MH	65515.9	278659.43	31.3	31.3	31.3																														-
AS6	SEP	65571.52	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	278654.4	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	278812.33	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	0.045	0.72	0.09	4.2	2.6		1	4G,1.5X	20.1	10.2	LOST
AW1	SEP	65611.78	278517.47	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	397.9	0.15	5.81	0.4	0.6	3		1	0.5G,3.0X	105	94.8.5	LOST
							3P	Kinematic Wave	624.5	0.6	0.25	247.65	11.27	0.4	82.2567	32.9027			0.6643																				
AW2	GULLY	65631.59	278596.7	28.15	28.15	28.15																														-
AZ1	SEP TWIN	65485.95	278911.69	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	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	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	6316.1	0.05	1.75	0.03	0.8	3		1	1G,1.5X	19.1	3.1	LOST
BB1	COMBO SEP	65403.88	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	5409.6	0.049	2.42	0.05	0.9	3		0.61	1G,3.0X	21.5	33.2	..2
BB2	MH	65403.58	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	1
BC2	MH	65423.87	280247.73	35.44	35.44	35.44																														-
BD1	SEP	65483.42	279091.59	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	0.049	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	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	0.019	2.14	0.03	0.5	3		1	0.5G,3.0X	23.8	4.2	AQ1
BF1	GULLY	65493.55	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	279319.76	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	15.3	0.042					0.047	1		28.2		-
E1	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	5475.7	0.016	1.97	0.03	0.8	3		1	1G,3.0X	27.6	3.4	LOST
Ex J1	MH	65361.75	280417.07	36.77	36.57	36.57																														-
D1	GULLY	65347.56	280359.4	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	65351.57	280316.23	37.08	37.08	37.08																														-
E1	SEP	65393.2	280311.26	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	65381.84	280318.34	36.77	36.77	36.77																														-
F1	COMBO SEP	65371.58	280315.58	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	2175.7	0.011	2.12	0.04	0.9	3.5		1	1G,3.0X	27	11.3	G1
G1	SEP	65391.73	280249.01	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	2195.4	0.046	2.31	0.04	0.9	3.5		1	1G,3.0X	29.4	18.6	BB1
G2	MH	65391.42	280210.03	35.87	35.87	35.87																														-
H1	SEP	65405.51	280213.54	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	280152.46	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	0.043	2.2	0.04	1	3		1	1G,3.0X	28.4	16.2	K1
J1	COMBO SEP	65435.92	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	2197.2	0.045	2.07	0.02	0.9	2.2		1	1G,1.5X	15.1	7.6	LOST
J2	GULLY	65439.8	280187.43	34.94	34.94	34.94																														-
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	0.018	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	0.018	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	10.7	0.013					0.071	1		43.4		LOST
M2	COMBO SEP TWIN	65453.92	280010.13	33.71	33.71	33.71																		28.8	1140.7	0.016	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	65521.52	279088.07	30.93	31.79	31.79																														-
O1	SEP	65493.65	280011.33	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	65511.67	279961.54	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	1118.1	0.014	1.74	0.02	2.1	2		1	2G,1.5X	13.6	5.4	LOST
R2	SEP	65494.91	279917.78	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	1179.4	0.013	1.85	0.05	2.4	3		1	2G,3.0X	24.7	17.7	M2
Q1	SEP	65539.46	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	65514.35	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	279916.69	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.

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 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)
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
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
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
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
AD1 to AD2	RCP 4	12.97	300	0.071	1	100	5	214.27	0.0623	37.1	5	214.27	0.0623	37.1		37.1		37.1		96.7	0.38	0.52
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
AF1 to S10	RCP 4	23.33	300	0.071	1	100										0		0		96.7	0	0
AG1 to S11	RCP 4	25.71	300	0.071	1	100										0		0		96.7	0	0
AH1 to AH2	RCB	66.01	(3x)x600	2.16	0.3	330									1440	1440		1440		3127.9	0.46	0.67
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
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
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
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
AM1 to AM2	RCP 4	35.11	(2x)375	0.221	0.56	179.7	229.3	19.1	8.3737	444.2	229.3	19.1	8.3737	444.2		444.2		444.2		261.7	1.7	2.01
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
AT1 to AT2	RCP 4	31.26	300	0.071	6.08	16.4										0		0		238.6	0	0
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
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
AZ1 to AO4	RCP 4	10.63	300	0.071	1	100	5	214.27	0.1447	86.1	5	214.27	0.1447	86.1		86.1	-45.6	40.5		96.7	0.42	0.57
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
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
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
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
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
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
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
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
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
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
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
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
J2 to ignorez	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
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
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
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
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
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
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
N1 to N2	HDPE SN8	12.12	450	0.159	0.58	173.8										0		0		216.4	0	0
O1 to Ex AO3	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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
Z1 to Z2	RCP 4	5.47	300	0.071	4.57	21.9										0		0		206.9	0	0
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

Pipe ID (-)	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	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	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	2.33	2.43	1.28	32.37	29.38	29.34	32.39	0.7	2.51	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	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	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	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	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	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	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	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	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	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	1.22	0.96	1.59	31.66	30.56	30.35	31.66	0.7	0.7	-90.1	0.065	9.7		0	0.04		0.01	31.03	30.99	30.98	30.98	0.03	2877.5	0.3	0.63
AM1 to AM2	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	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	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	1.23	0.98	1.59	36.03	34.81	34.6	35.87	0.7	0.79	-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	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	0	2.19	34.95	34.94	32.64	32.3	3.02	33.1	0.3	0.92
AO4 to AO5	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	0.16		0.2	32.91	32.75	32.48	32.3	2.55	39.3	0.3	0.45
B1 to Ex J1	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	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	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	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	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	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	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	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	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	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	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	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 ignorez	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	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	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	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	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	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	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	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 AO3	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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.

AMENDMENTS

REV.	DATE	BY	DESCRIPTION
0	04.23	DW	ISSUED FOR CONSTRUCTION

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 HYDRAULICS Q100

PROFORM CIVIL ENGINEERING GROUP
www.proformcivil.com

city of swan

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	1I	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	1I	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	1I	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	1I	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	1I	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	1I	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,1.5X	25.7	40	BG1
AK1	SEP	65508.83	279280.22	31.47	31.47	31.47	1I	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	1I	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	1I	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	1I	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	1I	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	1I	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	1I	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	1I	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	1I	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	1I	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	1I	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	1I	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	1I	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	1I	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	1I	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	1I	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	1I	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	1I	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	1I	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	1I	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	1I	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	1I	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	1I	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	1I	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	1I	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	1I	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	1I	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	0.88	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	1I	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	1I	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	1I	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	1I	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	1I	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	1I	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	1I	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	1I	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	1I	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	1I	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	1I	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	1I	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	1I	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	1I	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	1I	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	1I	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	1I	Direct				5	214.27	0.9	0.0514	0.0462	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	1I	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	1I	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	1I	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	1I	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	16.9	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	1I	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	1I	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	1I	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	1I	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	1I	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	1I	Direct				5	214.27	0.9	0.1429	0.1286	0.1286	76.6	0.1286	0.1286	76.6	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	1I	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	1I	Direct				5	214.27	0.9	0.0739	0.0665	0.0665	39.6	0.0665	0.0665	39.6	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	1I	Direct				5	214.27	0.9	0.0632	0.0569	0.0569	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	1I	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	1I	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	1I	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																													-

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.

AMENDMENTS

REV	DATE	BY	DESCRIPTION
0	04.23	DW	ISSUED FOR CONSTRUCTION

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 Q100

PROFORMCIVIL ENGINEERING GROUP
www.proformcivil.com

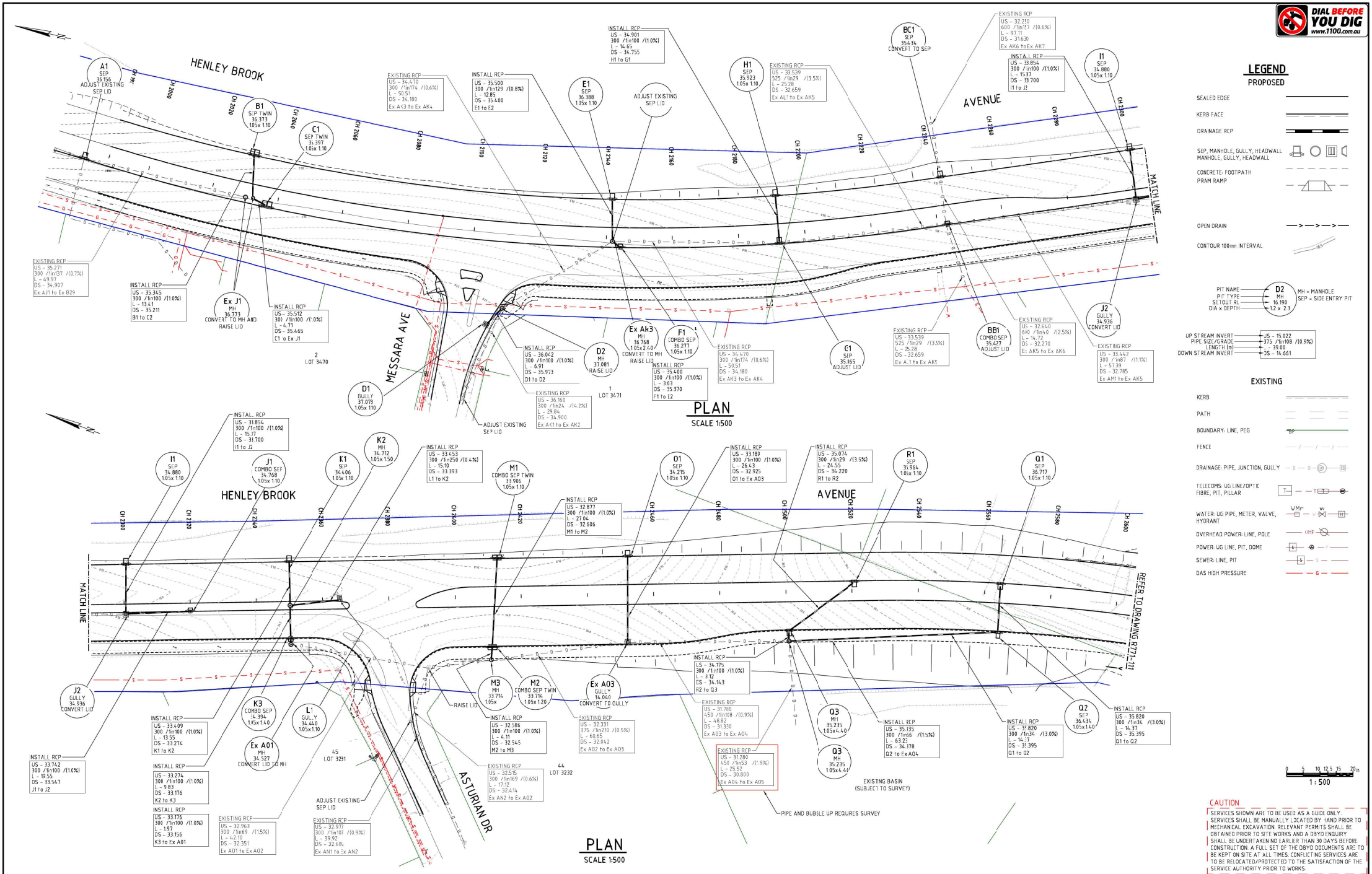
city of swan

DRAWING No: R771-129
REV No: 0

OPERATIONS

ATTACHMENT 4

Road Design



DIAL BEFORE YOU DIG www.1100.com.au

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 — e.g. 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 — e.g. US – 15.022, 375 /1in108 (0.9%), 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

1 : 500

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.

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: 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

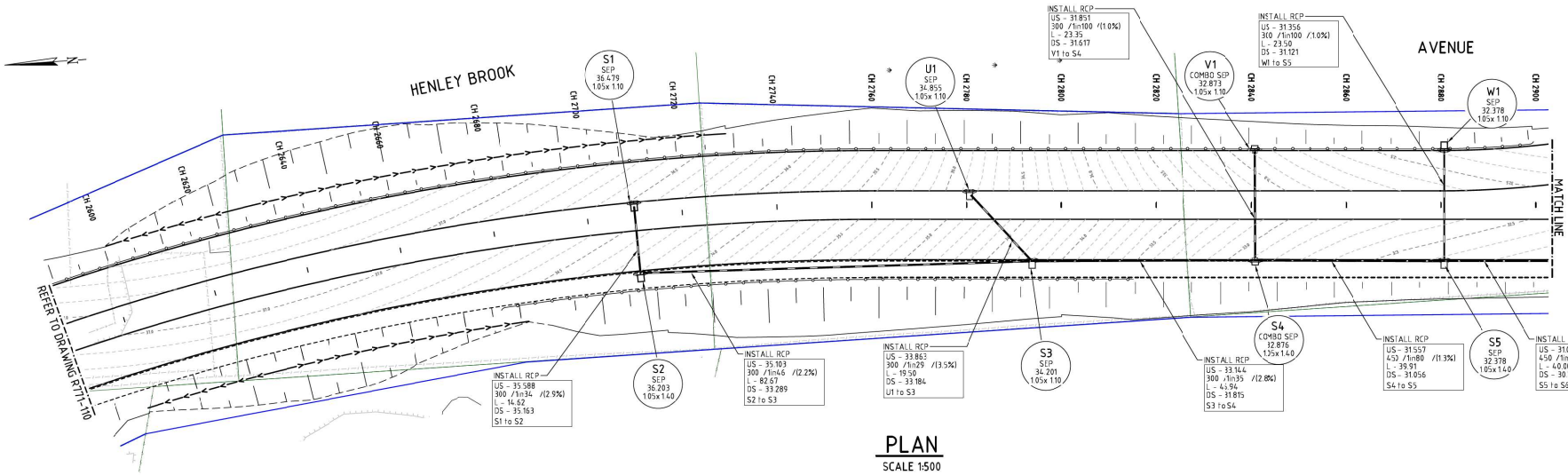
PROFORM CIVIL ENGINEERING GROUP www.proformcivil.com

city of swan

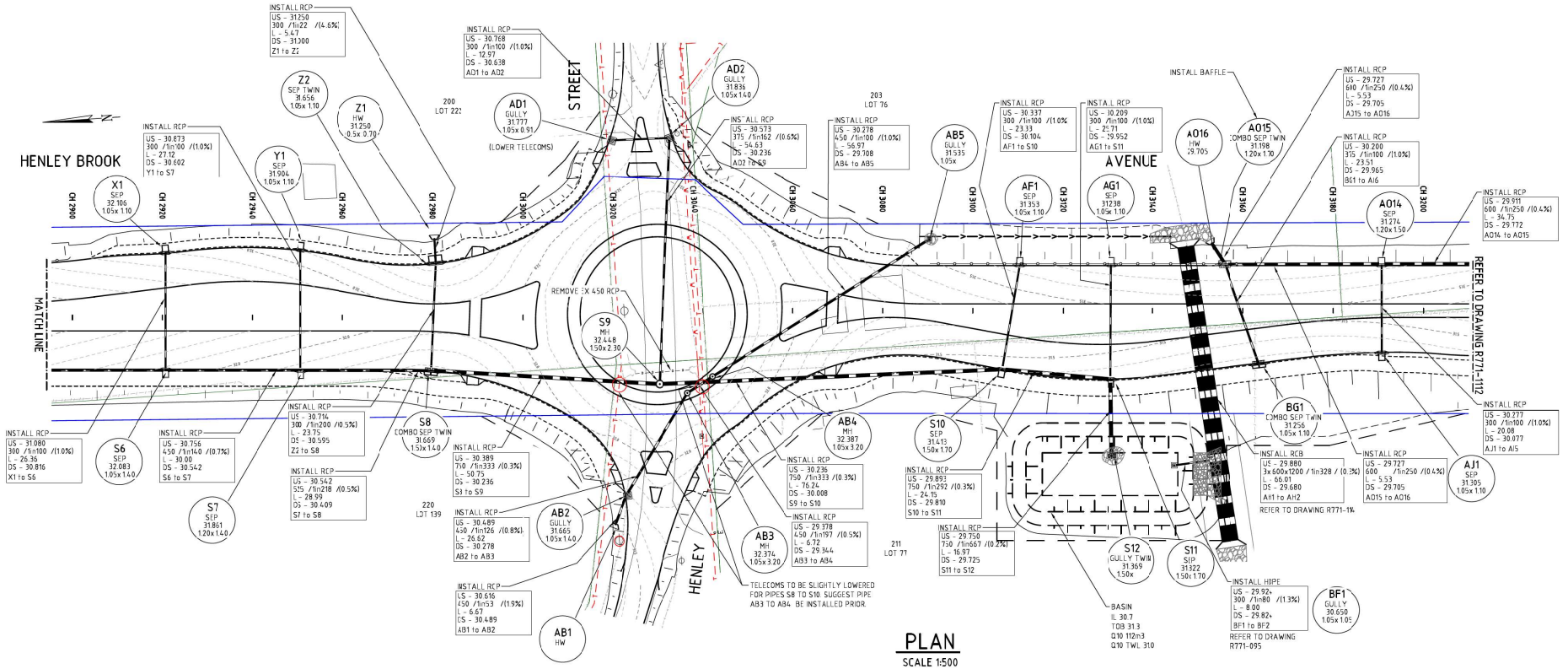
DRAWING No: R771-110

REV No: 0

OPERATIONS



PLAN
SCALE 1:500



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 / SET OUT RL / DIA x DEPTH — e.g. D2 / MH / 15.190 / 1.2 x 2.3 (MH = MANHOLE, SEP = SIDE ENTRY PIT)

UP STREAM INVERT / PIPE SIZE/GRADE / LENGTH (m) / DOWN STREAM INVERT — e.g. US – 15.022 / 375 /1in108 /(0.9%) / – 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

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.

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

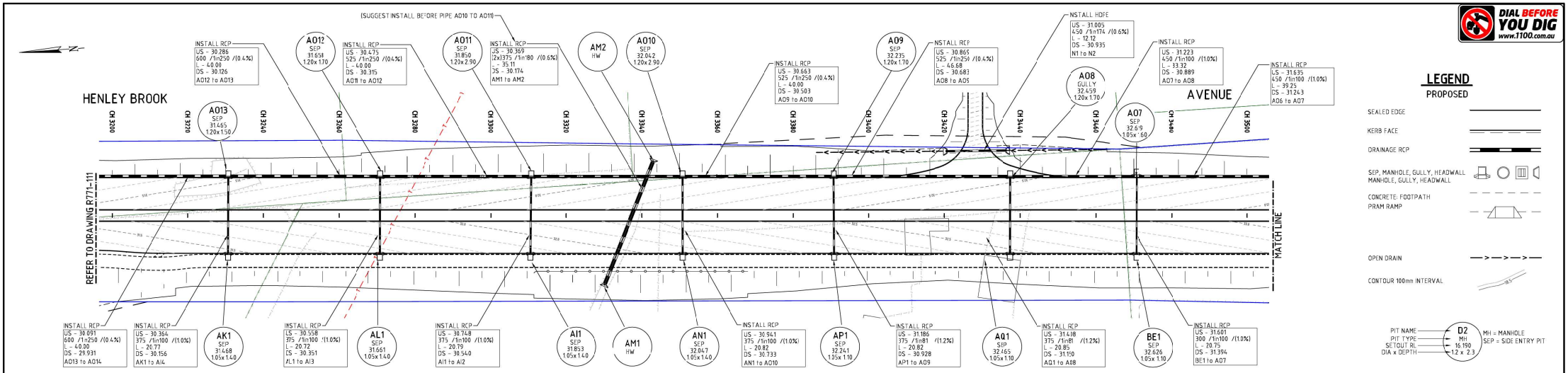
HENLEY BROOK AVE - STAGE 3
MESSARA AVENUE TO PARK STREET
DUAL CARRIAGEWAY
DRAINAGE PLAN SHEET 2 OF 4

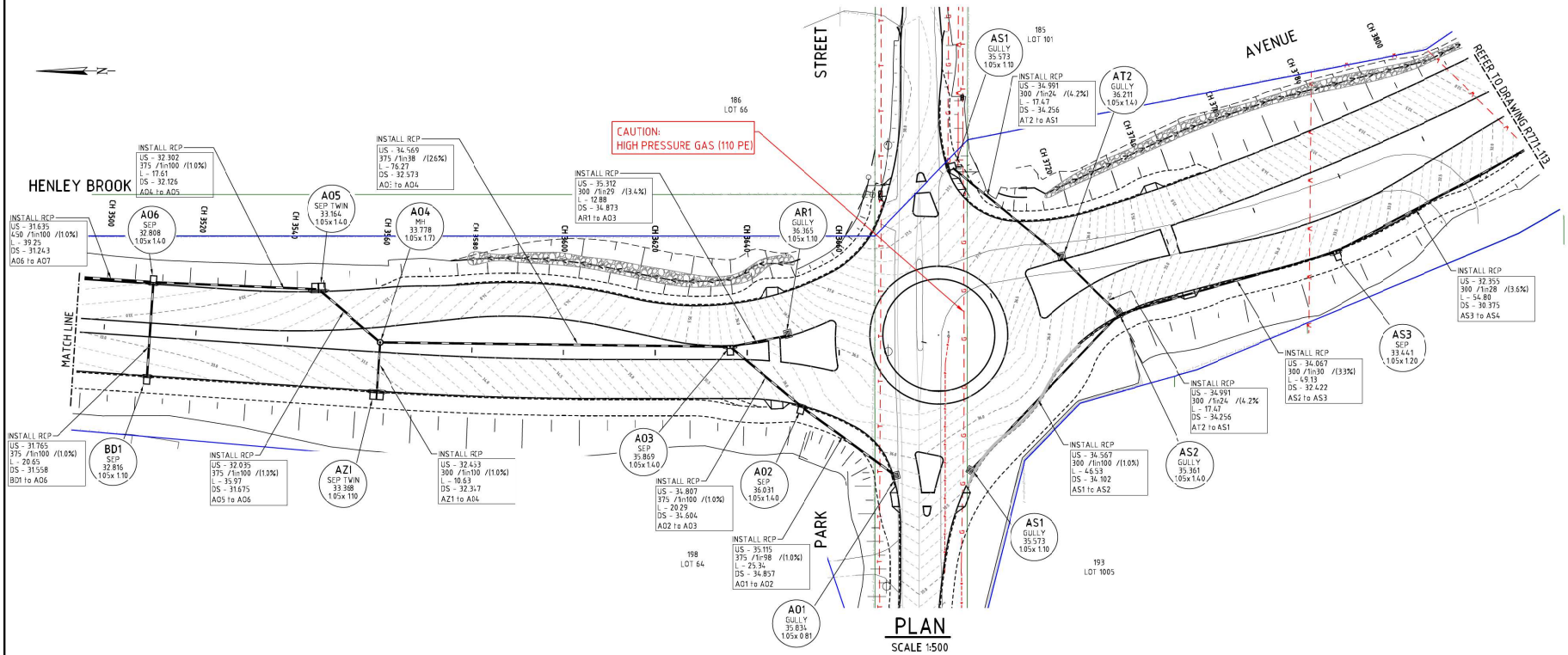
PROFORMCIVIL ENGINEERING GROUP www.proformcivil.com

city of swan

DRAWING No: R771-111
REV No: 0

OPERATIONS





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 / SET OUT RL / DIA x DEPTH — D2 / MH / 15.190 / 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%) / 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

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.

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: 1:500 (A1)

DATUM: A.H.D.

HENLEY BROOK AVE - STAGE 3

MESSARA AVENUE TO PARK STREET

DUAL CARRIAGEWAY

DRAINAGE PLAN SHEET 3 OF 4

PROFORM CIVIL ENGINEERING GROUP www.proformcivil.com

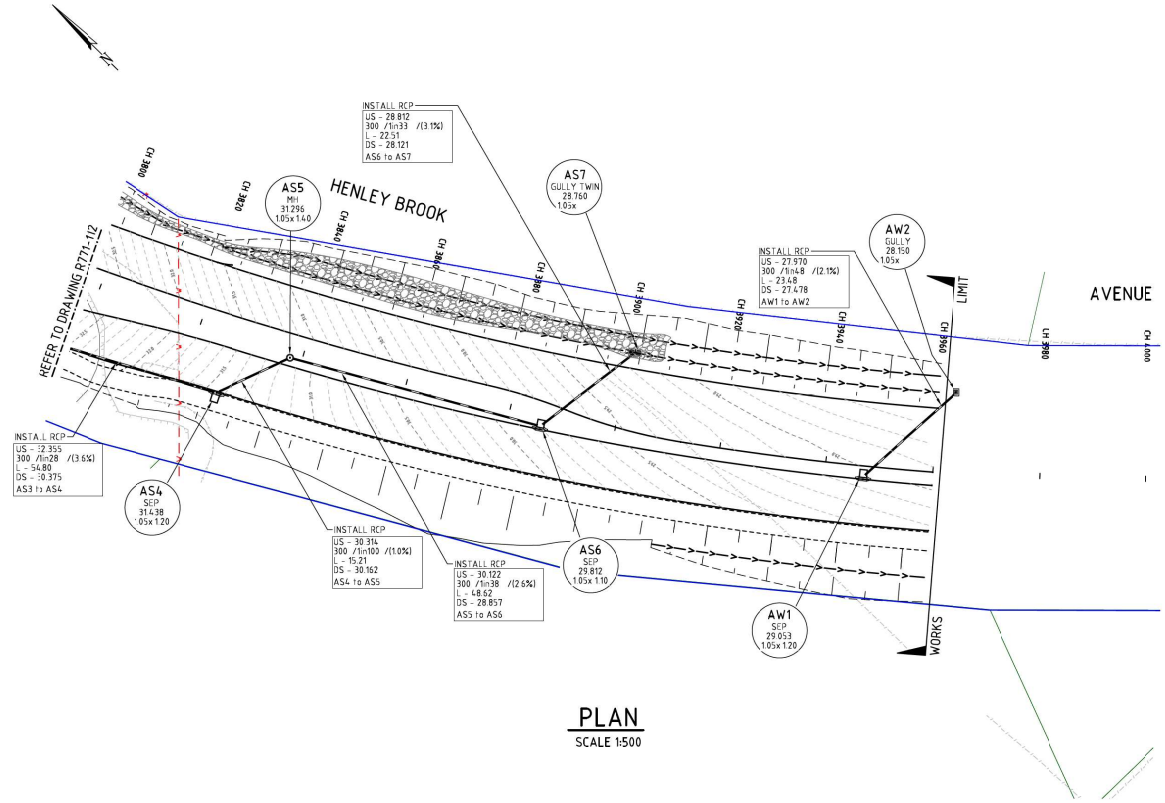
city of swan

DRAWING No: R771-112

REV No: 0

OPERATIONS

DIAL BEFORE YOU DIG www.1100.com.au



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%)
- 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

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.

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: 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.

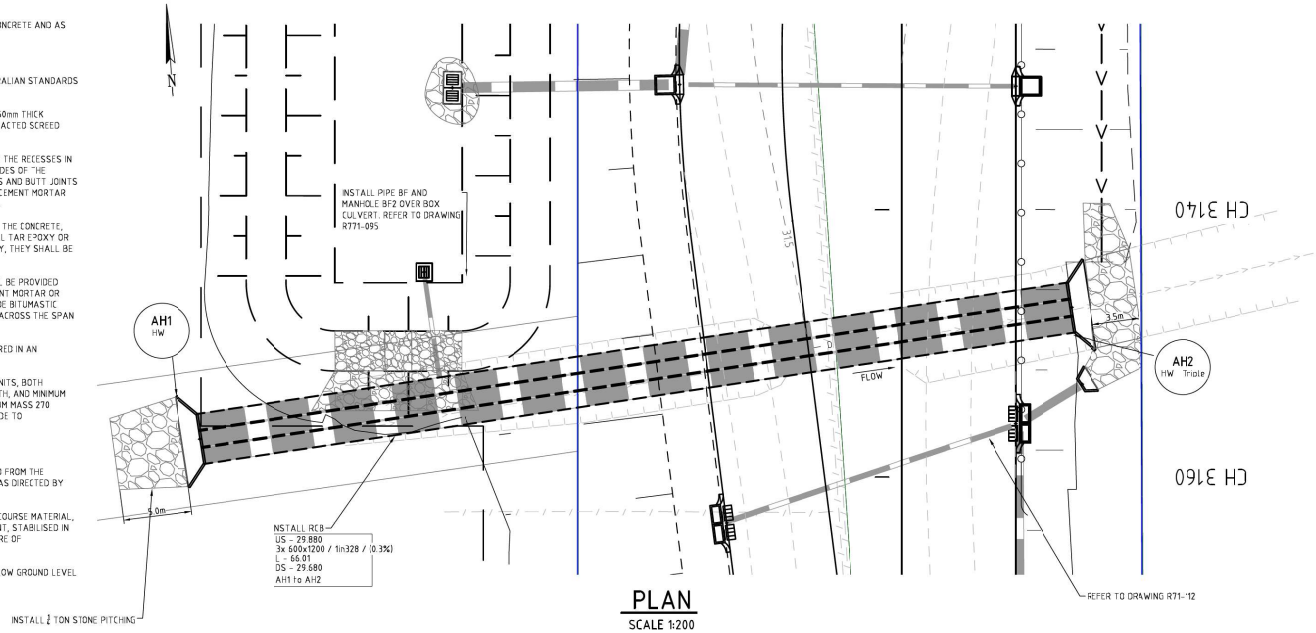
2.7. ALL EXTERNAL SURFACES OF JOINTS BETWEEN PRECAST CROWN UNITS, BOTH LATERALLY AND LONGITUDINALLY, SHALL BE COVERED FULL LENGTH, AND MINIMUM 250mm WIDTH, WITH STRIPS OF NON-WOVEN GEOTEXTILE OF MINIMUM MASS 270 GRAMS PER SQUARE METRE IN ACCORDANCE WITH AUSTROADS GUIDE TO GEOTEXTILES.

3. FOUNDATION & BACKFILL

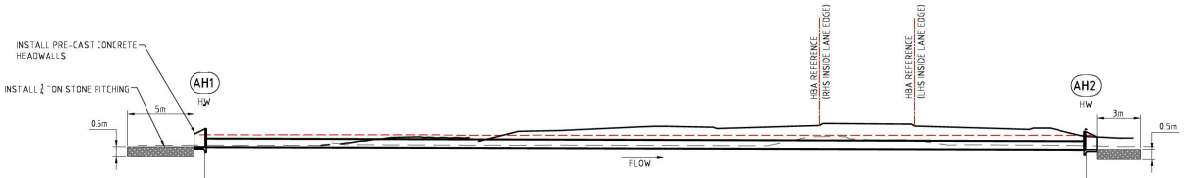
3.1. ALL SOFT, YIELDING OR UNSUITABLE MATERIAL SHALL BE REMOVED FROM THE FOUNDATION AND REPLACED WITH ORDINARY BACKFILL MATERIAL AS DIRECTED BY THE SUPERINTENDENT.

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.

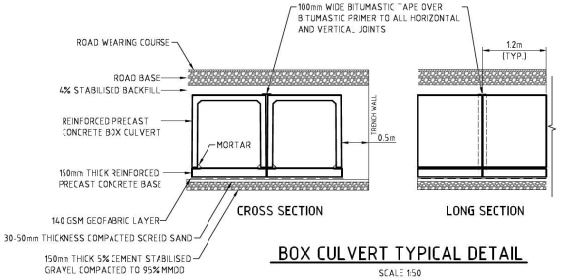


PLAN
SCALE 1:200



Diameter (mm)		(3x1x600 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		30.7+
INVERT LEVEL		29.88	29.68	29.43
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	0.01		66.01	

PROFILE
SCALE 1:200



BOX CULVERT TYPICAL DETAIL
SCALE 1:50

0 2 4 5 6 8m
1 : 200

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.

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

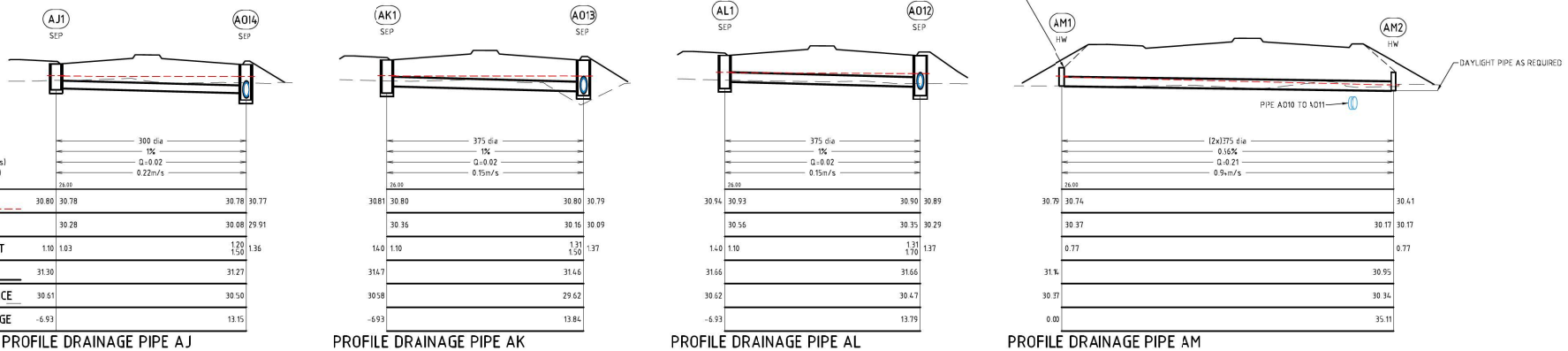
HENLEY BROOK AVE - STAGE 3
MESSARA AVENUE TO PARK STREET
DUAL CARRIAGEWAY
DRAINAGE PROFILES SHEET 1 OF 7

PROFORM CIVIL 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	

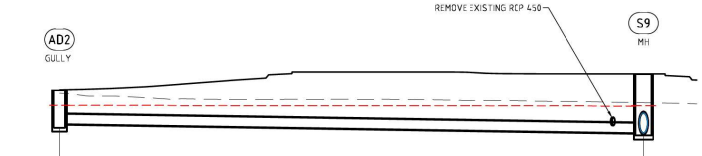
PROFILE DRAINAGE PIPE AK

	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

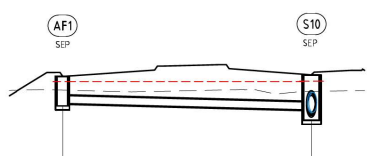
	AM1		AM2	
Diameter (mm)		(2x)375 dia		
Pipe Grade (%)		0.16%		
Design Flow (Q10 Cumecs)		Q=0.21		
Pipe Velocity (Q10 Flow)		0.94m/s		
DATUM RL	26.00			
HGL 10 YEAR	30.79	30.74		30.41
INVERT LEVEL		30.37		30.17
DEPTH TO INVERT		0.77		0.77
DESIGN SURFACE	31.14			30.95
NATURAL SURFACE	30.37			30.34
RUNNING CHAINAGE	0.00			35.11

PROFILE DRAINAGE PIPE AM



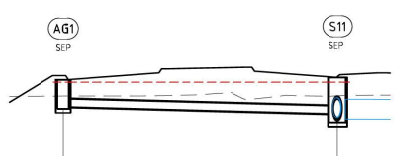
	AD2		S9	
Diameter (mm)		375 dia		
Pipe Grade (%)		0.62%		
Design Flow (Q10 Cumecs)		Q=0.04		
Pipe Velocity (Q10 Flow)		0.33m/s		
DATUM RL	27.00			
HGL 10 YEAR	31.29	31.27	31.25 / 31.26	31.22
INVERT LEVEL	30.64	30.57	30.24	30.24
DEPTH TO INVERT	1.20 / 1.40	1.26	2.30	2.21
DESIGN SURFACE	31.84		32.45	
NATURAL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

PROFILE DRAINAGE PIPE AD



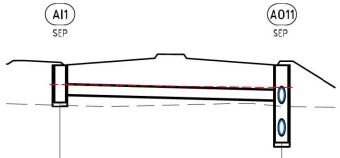
	AF1		S10	
Diameter (mm)		300 dia		
Pipe Grade (%)		1%		
Design Flow (Q10 Cumecs)		Q=0		
Pipe Velocity (Q10 Flow)		0m/s		
DATUM RL	26.00			
HGL 10 YEAR	31.17	31.17		31.15
INVERT LEVEL	30.34	30.10		29.89
DEPTH TO INVERT	1.10	1.02	1.31 / 1.70	1.52
DESIGN SURFACE	31.35		31.41	
NATURAL SURFACE	30.84		30.79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

PROFILE DRAINAGE PIPE AF



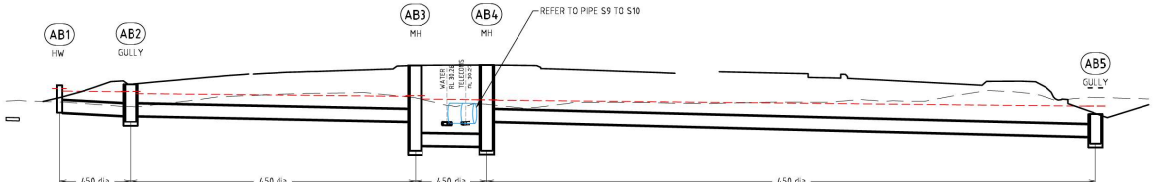
	AG1		S11	
Diameter (mm)		300 dia		
Pipe Grade (%)		1%		
Design Flow (Q10 Cumecs)		Q=0		
Pipe Velocity (Q10 Flow)		0m/s		
DATUM RL	26.00			
HGL 10 YEAR	31.14		31.14 / 31.5	31.10
INVERT LEVEL	30.21		29.55	29.75
DEPTH TO INVERT	1.10	1.03	1.37 / 1.70	1.57
DESIGN SURFACE	31.24		31.22	
NATURAL SURFACE	30.62		30.63	
RUNNING CHAINAGE	-6.93		18.78	

PROFILE DRAINAGE PIPE AG



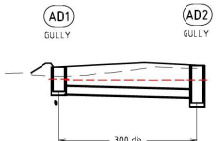
	AI1		AO11	
Diameter (mm)		375 dia		
Pipe Grade (%)		1%		
Design Flow (Q10 Cumecs)		Q=0.02		
Pipe Velocity (Q10 Flow)		0.15m/s		
DATUM RL	26.00			
HGL 10 YEAR	31.12		31.02	31.00
INVERT LEVEL	30.75		30.54	30.48
DEPTH TO INVERT	1.40	1.10	1.31 / 2.90	1.37
DESIGN SURFACE	31.85		31.85	
NATURAL SURFACE	30.35		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	1.00	1.04 / 3.20	2.11	0.84 / 1.10
DESIGN SURFACE	31.63	31.66			32.37		31.39		30.55
NATURAL SURFACE	31.01	30.83			31.16		30.92		31.18
RUNNING CHAINAGE	0.00	6.67			33.29		43.02		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		31.34
NATURAL SURFACE	31.42		31.13
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

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.

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: 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

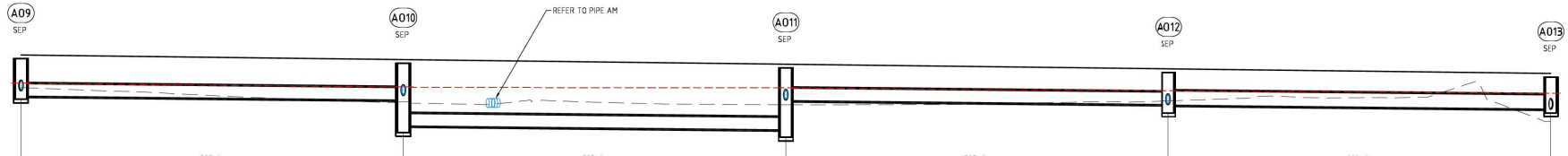
PROFORMCIVIL ENGINEERING GROUP www.proformcivil.com

city of swan

DRAWING No: R771-115

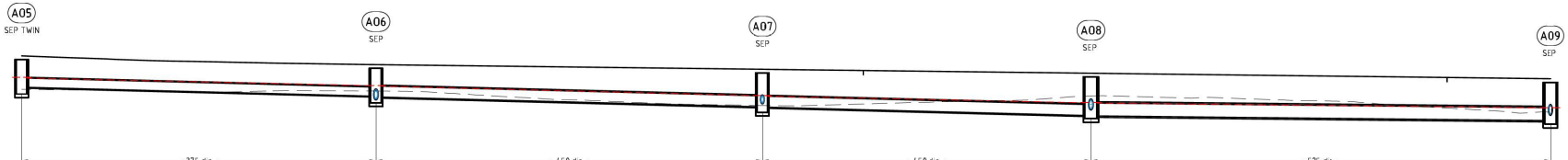
REV No: 0

OPERATIONS



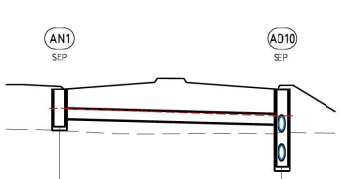
Diameter (mm)		525 dia				525 dia				525 dia			600 dia	
Pipe Grade (%)		0.4%				0.4%				0.4%			0.4%	
Design Flow (Q10 Cumecs)		Q=0.09				Q=0.1				Q=0.1			Q=0.1	
Pipe Velocity (Q10 Flow)		0.44m/s				0.44m/s				0.45m/s			0.35m/s	
DATUM RL	26.00													
HGL 10 YEAR	31.20	31.19			31.05	31.03			31.02	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				31.04				31.85				31.65		31.46
NATURAL SURFACE	31.03				31.43				30.31				30.47		29.62
RUNNING CHAINAGE	5.37				43.37				85.37				125.37		165.37

PROFILE DRAINAGE PIPE A0



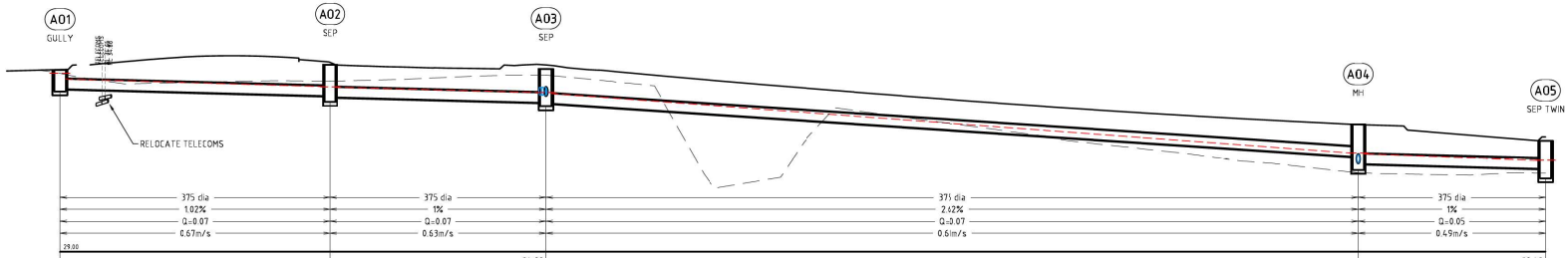
Diameter (mm)		375 dia				450 dia				450 dia			525 dia	
Pipe Grade (%)		1%				1%				1%			0.4%	
Design Flow (Q10 Cumecs)		Q=0.05				Q=0.07				Q=0.09			Q=0.01	
Pipe Velocity (Q10 Flow)		0.48m/s				0.47m/s				0.54m/s			0.43m/s	
DATUM RL	27.00													
HGL 10 YEAR	32.43 32.44	32.41			32.11 32.11	32.09			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 A0



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	31.33	31.32	31.05	31.03
INVERT LEVEL	30.94		30.71	29.42
DEPTH TO INVERT	1.40	1.11	1.31 2.91	2.62
DESIGN SURFACE	32.05		32.04	
NATURAL SURFACE	30.50		30.43	
RUNNING CHAINAGE	-6.93		13.81	

PROFILE DRAINAGE PIPE AN



Diameter (mm)		375 dia				375 dia				375 dia			375 dia	
Pipe Grade (%)		1.02%				1%				2.62%			1%	
Design Flow (Q10 Cumecs)		Q=0.07				Q=0.07				Q=0.07			Q=0.05	
Pipe Velocity (Q10 Flow)		0.67m/s				0.63m/s				0.61m/s			0.49m/s	
DATUM RL	29.00													
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		31.85
RUNNING CHAINAGE	-289.37				-264.03				-243.73				-167.47		-141.47

PROFILE DRAINAGE PIPE A0

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.

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

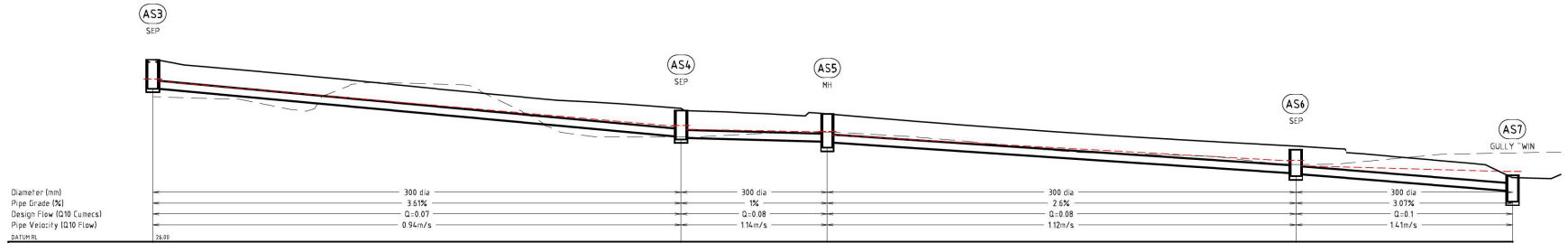
MESSARA AVENUE TO PARK STREET
DUAL CARRIAGEWAY
DRAINAGE PROFILES SHEET 3 OF 7

PROFORM CIVIL ENGINEERING GROUP
www.proformcivil.com

city of swan

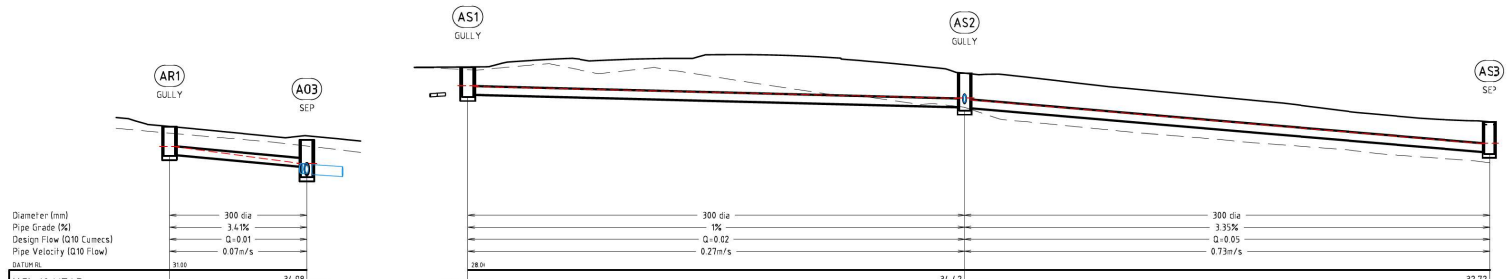
DRAWING No: R771-116
REV No: 0

OPERATIONS



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	100		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	-55.32				-10.53			4.68				53.30			75.81	

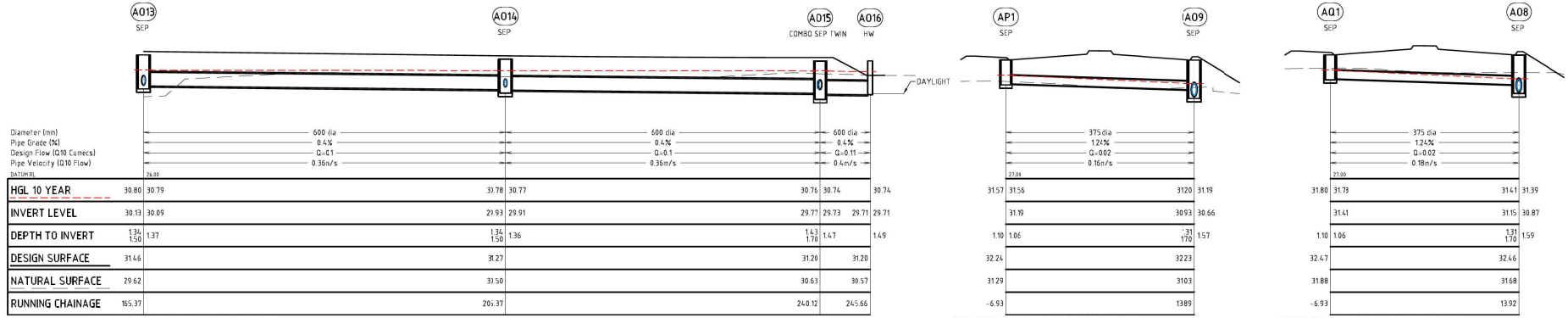
PROFILE DRAINAGE PIPE AS



Diameter (mm)		300 dia				300 dia				300 dia					
Pipe Grade (%)		3.41%				1%				3.35%					
Design Flow (Q10 Cumecs)		Q=0.01				Q=0.02				Q=0.05					
Pipe Velocity (Q10 Flow)		0.07m/s				0.27m/s				0.73m/s					
DATUM RL		31.00				28.01									
HGL 10 YEAR		35.61		34.98 34.99	34.94	34.90	34.37		34.42 34.43	34.37			32.72 32.74		
INVERT LEVEL		35.31		34.87	34.57		34.37		34.10	34.07			32.42		
DEPTH TO INVERT	1.10	1.05		1.00 1.40	1.30	1.10	1.01		1.26 1.40	1.29			1.12 1.20		
DESIGN SURFACE	36.37			35.87		35.57			35.36				33.54		
NATURAL SURFACE	36.12			35.64		35.49			34.09				32.01		
RUNNING CHAINAGE	0.00			12.88		-160.98			-114.46				-65.32		

PROFILE DRAINAGE PIPE AR

PROFILE DRAINAGE PIPE AS



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			31.78	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 1.78	1.47		1.49			
DESIGN SURFACE	31.46				31.27				31.20			31.20			
NATURAL SURFACE	29.62				31.50				30.63			30.57			
RUNNING CHAINAGE	165.37				205.37				240.12			245.66			

PROFILE DRAINAGE PIPE AO

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

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	31.73			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.

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 PROFILES SHEET 4 OF 7

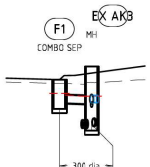
PROFORM CIVIL ENGINEERING GROUP
www.proformcivil.com

city of swan

DRAWING No: R771-117

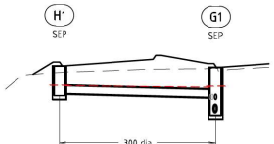
REV No: 0

OPERATIONS



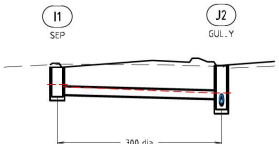
Diameter (mm)		300 dia				
Pipe Grade (%)		1%				
Design Flow (Q10 Cumecs)		Q=0.03				
Pipe Velocity (Q10 Flow)		0.38m/s				
DATUM RL		31.00				
HGL 10 YEAR	35.77	35.70	35.69 35.66	35.45		
INVERT LEVEL		35.40	35.37	35.25		
DEPTH TO INVERT	1.10	0.88	1.40 2.40	1.52		
DESIGN SURFACE	36.28	36.77				
NATURAL SURFACE	36.14	36.18				
RUNNING CHAINAGE	0.00	3.03				

PROFILE DRAINAGE PIPE F



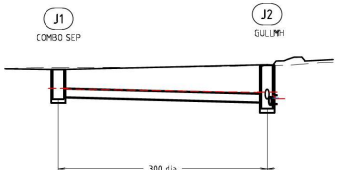
Diameter (mm)		300 dia				
Pipe Grade (%)		1%				
Design Flow (Q10 Cumecs)		Q=0.02				
Pipe Velocity (Q10 Flow)		0.22m/s				
DATUM RL		31.00				
HGL 10 YEAR	35.23	35.20	35.15 35.18	34.87		
INVERT LEVEL		34.90	34.75	34.67		
DEPTH TO INVERT	1.10	1.02	1.11 1.79	1.19		
DESIGN SURFACE	35.92	35.87				
NATURAL SURFACE	35.68	35.84				
RUNNING CHAINAGE	0.00	14.65				

PROFILE DRAINAGE PIPE H



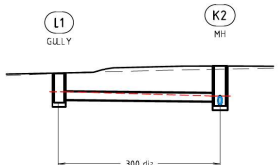
Diameter (mm)		300 dia				
Pipe Grade (%)		1%				
Design Flow (Q10 Cumecs)		Q=0.03				
Pipe Velocity (Q10 Flow)		0.4m/s				
DATUM RL		30.00				
HGL 10 YEAR	34.23	34.15	33.91 33.93	33.80		
INVERT LEVEL		33.85	33.70	33.50		
DEPTH TO INVERT	1.10	1.03	1.24 1.64	1.43		
DESIGN SURFACE	34.88	34.94				
NATURAL SURFACE	34.99	34.92				
RUNNING CHAINAGE	0.00	15.37				

PROFILE DRAINAGE PIPE I



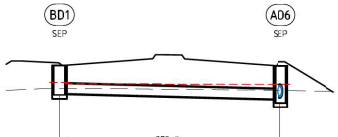
Diameter (mm)		300 dia				
Pipe Grade (%)		1%				
Design Flow (Q10 Cumecs)		Q=0.02				
Pipe Velocity (Q10 Flow)		0.21m/s				
DATUM RL		29.00				
HGL 10 YEAR	34.06	34.04	33.91 33.93	33.80		
INVERT LEVEL		33.74	33.55	33.50		
DEPTH TO INVERT	1.10	1.03	1.39 1.64	1.43		
DESIGN SURFACE	34.77	34.94				
NATURAL SURFACE	34.85	34.92				
RUNNING CHAINAGE	0.00	19.55				

PROFILE DRAINAGE PIPE J



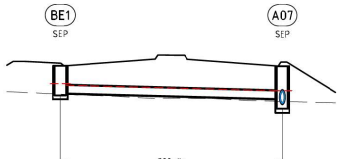
Diameter (mm)		300 dia				
Pipe Grade (%)		0.4%				
Design Flow (Q10 Cumecs)		Q=0.01				
Pipe Velocity (Q10 Flow)		0.1m/s				
DATUM RL		29.00				
HGL 10 YEAR		33.75	33.59	33.57		
INVERT LEVEL		33.45	33.39	33.27		
DEPTH TO INVERT	1.10	0.99	1.32 1.50	1.44		
DESIGN SURFACE	34.44	34.71				
NATURAL SURFACE	34.44	34.59				
RUNNING CHAINAGE	0.00	15.10				

PROFILE DRAINAGE PIPE L



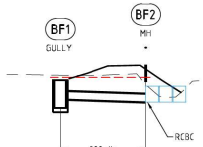
Diameter (mm)		375 dia				
Pipe Grade (%)		1%				
Design Flow (Q10 Cumecs)		Q=0.03				
Pipe Velocity (Q10 Flow)		0.28m/s				
DATUM RL		28.00				
HGL 10 YEAR	32.18	32.14	32.11 32.11	32.09		
INVERT LEVEL		31.76	31.56	31.64		
DEPTH TO INVERT	1.10	1.05	1.25 1.40	1.17		
DESIGN SURFACE	32.82	32.81				
NATURAL SURFACE	31.95	31.88				
RUNNING CHAINAGE	-6.93	13.72				

PROFILE DRAINAGE PIPE BD



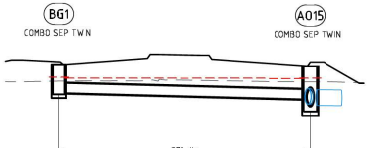
Diameter (mm)		300 dia				
Pipe Grade (%)		1%				
Design Flow (Q10 Cumecs)		Q=0.02				
Pipe Velocity (Q10 Flow)		0.34m/s				
DATUM RL		27.00				
HGL 10 YEAR	31.96	31.90	31.70 31.71	31.67		
INVERT LEVEL		31.60	31.39	31.22		
DEPTH TO INVERT	1.10	1.02	1.23 1.60	1.40		
DESIGN SURFACE	32.63	32.62				
NATURAL SURFACE	31.57	31.30				
RUNNING CHAINAGE	-6.93	13.82				

PROFILE DRAINAGE PIPE BE



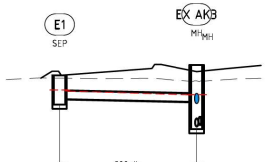
Diameter (mm)		300 dia				
Pipe Grade (%)		1.25%				
Design Flow (Q10 Cumecs)		Q=1.29				
Pipe Velocity (Q10 Flow)		18.21m/s				
DATUM RL		26.00				
HGL 10 YEAR		30.74		30.74		
INVERT LEVEL		29.92	29.82	30.60		
DEPTH TO INVERT	1.05	0.73	1.39	0.60		
DESIGN SURFACE	30.65	31.20				
NATURAL SURFACE	30.83	30.49				
RUNNING CHAINAGE	0.00	8.00				

PROFILE DRAINAGE PIPE BF



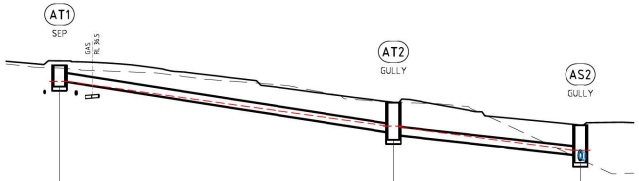
Diameter (mm)		375 dia				
Pipe Grade (%)		%				
Design Flow (Q10 Cumecs)		Q=0.03				
Pipe Velocity (Q10 Flow)		0.2m/s				
DATUM RL		26.00				
HGL 10 YEAR	30.79	30.76		30.74		
INVERT LEVEL		30.20		29.96	29.73	
DEPTH TO INVERT	1.10	1.06		1.23 1.70	1.47	
DESIGN SURFACE	31.26	31.20				
NATURAL SURFACE	30.65	30.63				
RUNNING CHAINAGE	0.00	23.51				

PROFILE DRAINAGE PIPE BG



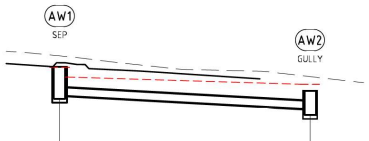
Diameter (mm)		300 dia				
Pipe Grade (%)		0.78%				
Design Flow (Q10 Cumecs)		Q=0.02				
Pipe Velocity (Q10 Flow)		0.28m/s				
DATUM RL		31.00				
HGL 10 YEAR	35.84	35.80	35.65 35.66	35.45		
INVERT LEVEL		35.50	35.40	35.25		
DEPTH TO INVERT	1.10	0.89	1.37 2.40	1.52		
DESIGN SURFACE	36.39	36.77				
NATURAL SURFACE	36.28	36.18				
RUNNING CHAINAGE	0.00	12.85				

PROFILE DRAINAGE PIPE E



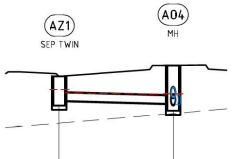
Diameter (mm)		300 dia		300 dia		
Pipe Grade (%)		6.08%		4.21%		
Design Flow (Q10 Cumecs)		Q=0		Q=0.02		
Pipe Velocity (Q10 Flow)		0m/s		0.28m/s		
DATUM RL		31.00				
HGL 10 YEAR		37.01	35.33	35.29	34.42 34.43	34.37
INVERT LEVEL		37.01	35.11	34.99	34.26	34.07
DEPTH TO INVERT	0.80	0.59	1.10 1.40	1.22	1.11 1.40	1.29
DESIGN SURFACE	37.60	16.21			35.36	
NATURAL SURFACE	37.50	16.21			34.09	
RUNNING CHAINAGE	-35.00	-3.74			13.73	

PROFILE DRAINAGE PIPE AT



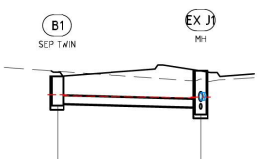
Diameter (mm)		300 dia				
Pipe Grade (%)		2.1%				
Design Flow (Q10 Cumecs)		Q=0.1				
Pipe Velocity (Q10 Flow)		1.49m/s				
DATUM RL		24.00				
HGL 10 YEAR	29.03	28.67			28.39	
INVERT LEVEL		27.97		27.48	27.25	
DEPTH TO INVERT	1.20	1.08		0.67	0.90	
DESIGN SURFACE	29.05	28.15				
NATURAL SURFACE	29.46	28.68				
RUNNING CHAINAGE	0.00	23.48				

PROFILE DRAINAGE PIPE AW



Diameter (mm)		300 dia				
Pipe Grade (%)		1%				
Design Flow (Q10 Cumecs)		Q=0.03				
Pipe Velocity (Q10 Flow)		0.48m/s				
DATUM RL		28.00				
HGL 10 YEAR	32.87	32.75	32.71	32.68		
INVERT LEVEL		32.45	32.35	32.39		
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



Diameter (mm)		300 dia				
Pipe Grade (%)		1%				
Design Flow (Q10 Cumecs)		Q=0.02				
Pipe Velocity (Q10 Flow)		0.27m/s				
DATUM RL		31.00				
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

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.

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.

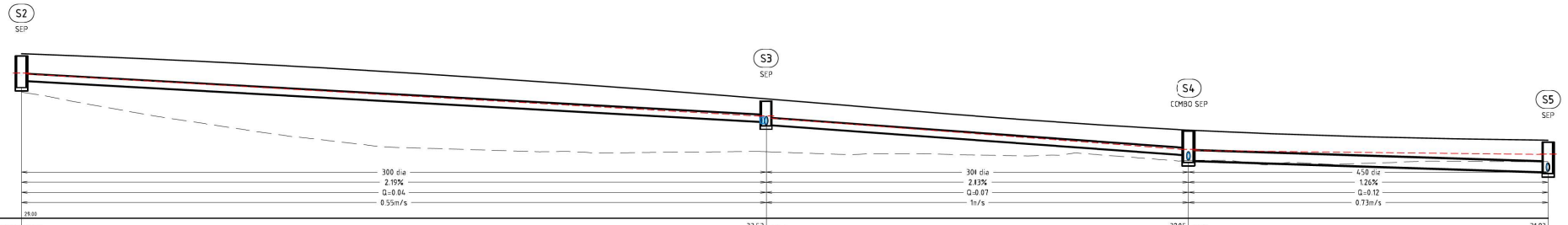
HENLEY BROOK AVE - STAGE 3
MESSARA AVENUE TO PARK STREET
DUAL CARRIAGEWAY
DRAINAGE PROFILES SHEET 5 OF 7

PROFORMCIVIL ENGINEERING GROUP
www.proformcivil.com

city of swan

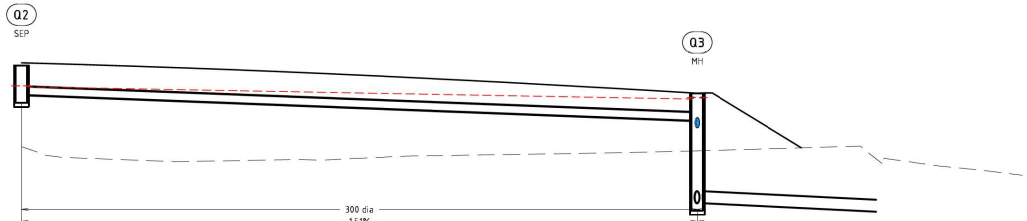
DRAWING No: R771-118
REV No: 0

OPERATIONS



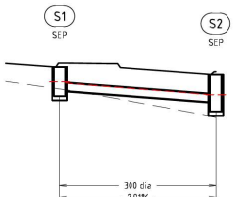
DATUM RL	29.00									
HGL 10 YEAR	35.45	35.40		33.53 33.54	33.44		32.05 32.06	32.01	31.83 31.84	
INVERT LEVEL	35.16	35.10		33.29	33.14		31.82	31.56	31.06	
DEPTH TO INVERT	1.04 1.40	1.10		0.91 1.10	1.06		1.06 1.40	1.32	1.40	1.32
DESIGN SURFACE	36.20			34.20			32.88		32.38	
NATURAL SURFACE	34.60			31.96			31.57		31.52	
RUNNING CHAINAGE	-45.87			36.80			83.74		123.65	

PROFILE DRAINAGE PIPE S



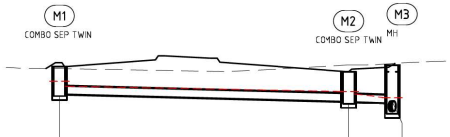
DATUM RL	29.00				
HGL 10 YEAR	35.67	35.63		35.18 35.23	34.96
INVERT LEVEL	35.39	35.33		34.38	31.28
DEPTH TO INVERT	1.04 1.40	1.10		1.02 4.40	4.12
DESIGN SURFACE	36.43			35.40	
NATURAL SURFACE	33.40			33.24	
RUNNING CHAINAGE	14.37			77.60	

PROFILE DRAINAGE PIPE Q



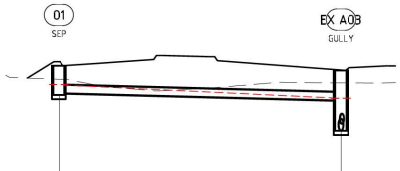
DATUM RL	30.00			
	35.92	35.85	35.45	
		35.55	35.16	
	1.10	0.89	1.04 1.40	
	36.48		36.20	
	35.66		34.60	
	-60.49		-45.87	

PROFILE DRAINAGE PIPE S



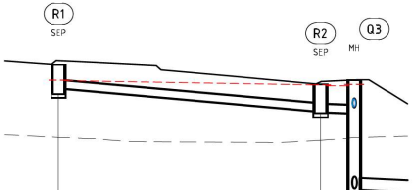
DATUM RL	29.00				
HGL 10 YEAR	33.35	33.18	32.98	32.89	32.74
INVERT LEVEL	32.88	32.61	32.59	32.55	32.14
DEPTH TO INVERT	1.10	1.03	1.11 1.20	1.13	1.42 1.83
DESIGN SURFACE	33.91		33.71		33.97
NATURAL SURFACE	33.83		33.97		34.02
RUNNING CHAINAGE	0.00		27.04		31.15

PROFILE DRAINAGE PIPE M



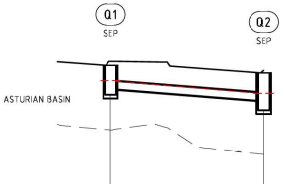
DATUM RL	28.00			
	33.51	33.49		33.01
		33.19	32.92	31.77
	1.10	1.03	1.12	2.27
	34.22		34.04	
	33.71		33.57	
	0.00		26.43	

PROFILE DRAINAGE PIPE O



DATUM RL	29.00				
	35.39	35.37	35.21	35.18 35.23	34.96
		35.07	34.22	34.17 34.14	31.28
	1.10	0.89	1.02 1.10	1.06 1.25 4.40	4.12
	35.96		35.24	35.40	
	33.25		33.14	33.24	
	0.00		24.55	27.67	

PROFILE DRAINAGE PIPE P



DATUM RL	30.00			
	36.15	36.12	35.67	
		35.82	35.39	
	1.10	0.90	1.04 1.40	
	36.72		36.43	
	34.29		33.40	
	0.00		27.40	

PROFILE DRAINAGE PIPE Q

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 WORKS AND A DBYD ENQUIRY SHALL BE LODGED 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.

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 PROFILES SHEET 6 OF 7

PROFORM CIVIL
ENGINEERING GROUP
www.proformcivil.com

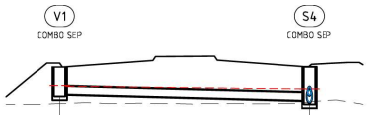
city of swan

DRAWING No: R771-119

REV No: 0

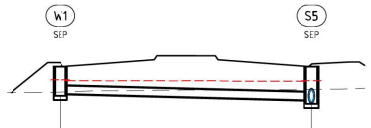
OPERATIONS

DIAL BEFORE YOU DIG www.1100.com.au



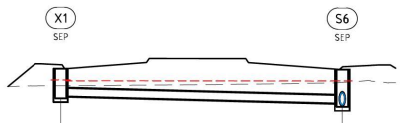
Diameter (mm)		300 dia				
Pipe Grade (%)		1%				
Design Flow (Q10 Cumecs)		Q=0.02				
Pipe Velocity (Q10 Flow)		0.22m/s				
DATUM RL	28.00					
HGL 10 YEAR	32.18	32.15		32.09 32.08	32.41	
INVERT LEVEL		31.85		31.62	31.16	
DEPTH TO INVERT	1.10	1.02		1.26 1.40	1.32	
DESIGN SURFACE	32.87			32.88		
NATURAL SURFACE	31.50			31.57		
RUNNING CHAINAGE	0.00			23.35		

PROFILE DRAINAGE PIPE V



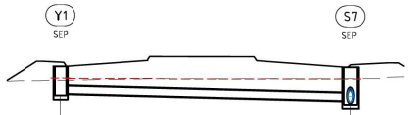
Diameter (mm)		300 dia				
Pipe Grade (%)		1%				
Design Flow (Q10 Cumecs)		Q=0.02				
Pipe Velocity (Q10 Flow)		0.27m/s				
DATUM RL	27.00					
HGL 10 YEAR	31.88	31.84		31.83 31.84	31.77	
INVERT LEVEL		31.36		31.12	31.06	
DEPTH TO INVERT	1.10	1.02		1.26 1.40	1.32	
DESIGN SURFACE	32.38			32.38		
NATURAL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

PROFILE DRAINAGE PIPE W



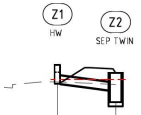
Diameter (mm)		300 dia				
Pipe Grade (%)		1%				
Design Flow (Q10 Cumecs)		Q=0.02				
Pipe Velocity (Q10 Flow)		0.32m/s				
DATUM RL	27.00					
HGL 10 YEAR	31.70	31.66		31.65 31.66	31.56	
INVERT LEVEL		31.08		30.82	30.76	
DEPTH TO INVERT	1.10	1.03		1.27 1.40	1.33	
DESIGN SURFACE	32.11			32.08		
NATURAL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

PROFILE DRAINAGE PIPE X



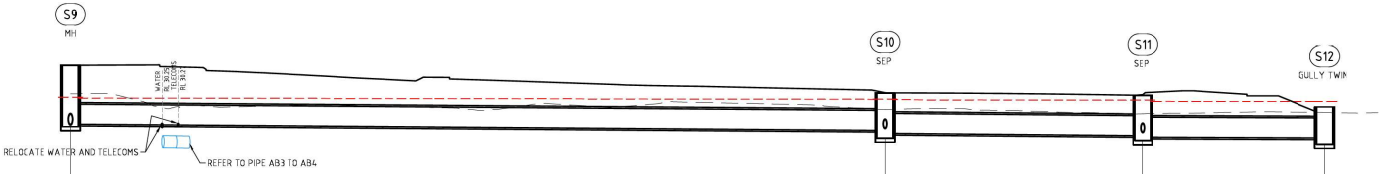
Diameter (mm)		300 dia				
Pipe Grade (%)		1%				
Design Flow (Q10 Cumecs)		Q=0.0				
Pipe Velocity (Q10 Flow)		0.26m/s				
DATUM RL	27.10					
HGL 10 YEAR	31.46	31.44		31.43 31.43	31.38	
INVERT LEVEL		30.87		30.60	30.54	
DEPTH TO INVERT	1.10	1.03		1.26 1.40	1.32	
DESIGN SURFACE	31.90			31.86		
NATURAL SURFACE	31.37			31.44		
RUNNING CHAINAGE	0.00			27.12		

PROFILE DRAINAGE PIPE Y



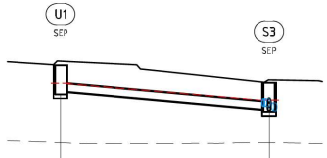
Diameter (mm)		300 dia				
Pipe Grade (%)		4.57%				
Design Flow (Q10 Cumecs)		Q=0				
Pipe Velocity (Q10 Flow)		0m/s				
DATUM RL	27.00					
HGL 10 YEAR		31.40	31.40			
INVERT LEVEL		31.25	31.00			
DEPTH TO INVERT		0.70	0.66 1.10			
DESIGN SURFACE			31.66			
NATURAL SURFACE		31.32	31.22			
RUNNING CHAINAGE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

PROFILE DRAINAGE PIPE Z



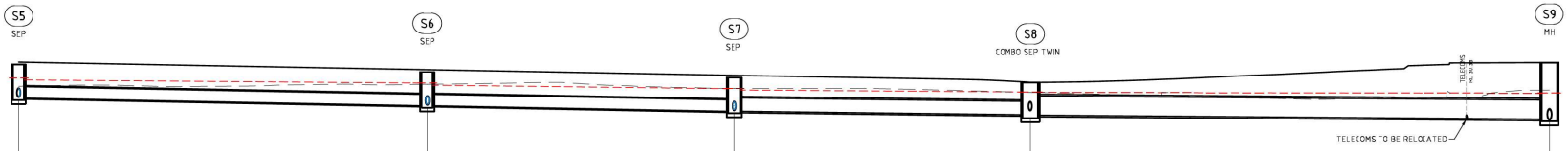
Diameter (mm)		750 dia			750 dia		750 dia	
Pipe Grade (%)		0.3%			0.34%		0.15%	
Design Flow (Q10 Cumecs)		Q=0.29			Q=0.28		Q=0.28	
Pipe Velocity (Q10 Flow)		0.67m/s			0.64m/s		0.63m/s	
DATUM RL	26.00							
HGL 10 YEAR	31.25 31.26	31.22		31.17	31.15	31.14 31.15	31.10	31.09
INVERT LEVEL	30.24	30.24		30.01	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



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	33.33 33.54	33.44
INVERT LEVEL		33.86	33.18	33.14
DEPTH TO INVERT	1.10	4.99	1.22 1.10	1.06
DESIGN SURFACE	34.85		34.20	
NATURAL SURFACE	31.96		31.36	
RUNNING CHAINAGE	0.00		19.50	

PROFILE DRAINAGE PIPE U



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
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.

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 PROFILES SHEET 7 OF 7

PROFORMCIVIL ENGINEERING GROUP www.proformcivil.com

city of swan

DRAWING No: R771-120
REV No: 0

OPERATIONS

DIAL BEFORE YOU DIG www.1100.com.au

PIT SCHEDULE

NAME	TYPE	EASTING	NORTHING	SETOUT RL	DIAMETER	DEPTH	REMARKS
A1	SEP	65368.86	2804.99.476	36.156	1.05	1.75	CONVERT SEP
A81	HW	65486.156	279492.43	30.616	0.5	1.02	
A82	GULLY	654.92.203	279489.748	31.665	1.05	1.4	
A83	MH	65514.087	279474.464	32.374	1.05	3.2	
A84	MH	65517.332	279468.574	32.387	1.05	3.2	
A85	GULLY	65544.371	279418.431	31.535	1.05	1.1	
A01	GULLY	65571.331	279487.817	31.77"	1.05	0.91	
A02	GULLY	65570.945	279473.871	31.836	1.05	1.4	
A^1	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	654.72.953	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	31.464	1.05	1.4	
A..1	SEP	65506.051	279240.309	31.66	1.05	1.4	
AM1	HW	654.93.629	279181.576	30.364	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	
AC12	SEP	65525.999	279238.867	31.658	1.2	1.7	
AO13	SEP	65529.22	279278.74	31.465	1.2	1.5	
AC14	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	654.82.526	278859.155	36.031	1.05	1.4	
AO3	SEP	654.95.393	278874.71	35.864	1.05	1.4	
AO4	MH	654.96.554	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	654.97.699	279120.401	32.241	1.05	1.1	
AQ1	SEP	654.94.469	279074.033	32.465	1.05	1.1	
AR1	GULLY	654.97.64	278862.009	36.365	1.05	1.1	
AS1	GULLY	654.68.096	278821.876	35.571	1.05	1.1	
AS2	GULLY	65502.028	278789.94	35.361	1.05	1.4	
AS3	SEP	65515.674	278742.752	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	
A^2	GULLY	65514.312	278802.333	36.21'	1.05	1.4	
AW1	SEP	65615.778	278597.47	29.053	1.05	1.2	
AW2	GULLY	65639.587	278596.659	28.15	1.05	0.9	
AZ1	SEP TWIN	654.85.949	278951.692	33.368	1.05	1.1	
B1	SEP TWIN	653.81.444	280449.664	36.371	1.05	1.1	
B81	COMBO SEP	654.08.878	280240.858	35.427	1.05	1.1	ADJUST LID
BC1	SEP	654.22.383	280246.134	35.434	1.05	1.46	CONVERT LID TO SEP
BD1	SEP	654.89.423	279001.586	32.816	1.05	1.1	
BE1	SEP	654.92.154	279040.865	32.624	1.05	1.1	
BF1	GULLY	654.90.552	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 AO3	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	28014.6.51	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	279480.433	32.448	1.5	2.3	
U1	SEP	65551.573	279728.336	34.855	1.05	1.1	
V1	COMBO SEP	65555.879	279657.828	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	279528.115	31.656	1.05	1.1	

PIPE SCHEDULE

NAME	DIAMETER	LENGTH	U/S IL	D/S IL	SLOPE(1in)	SLOPE(%)	CLASS
BF1 to BF2	300	8	29.924	29.824	-80	1.25	HDPE SN8
AO1 to AO2	300	12.97	34.768	30.638	-100	1	RCP 4
AF1 to S10	300	23.33	34.337	30.104	-100	1	RCP 4
AG1 to S11	300	25.71	34.209	29.952	-100	1	RCP 4
AJ1 to AI5	300	20.08	34.277	30.077	-100	1	RCP 4
AR1 to AO3	300	12.88	35.312	34.813	-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	32.442	-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	28.817	-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	34.216	-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	35.21	-100	1	RCP 4
BE1 to AO7	300	20.75	31.601	31.394	-100	1	RCP 4
C1 toEx J1	300	4.71	35.512	35.465	-100	1	RCP 4
D1 to D2	300	6.91	36.042	35.913	-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	34.715	-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	33.353	-250.2	0.4	RCP 4
M1 to M2	300	27.04	32.877	32.666	-100	1	RCP 4
M2 to M3	300	4.11	32.586	32.545	-100	1	RCP 4
O1 to Ex A03	300	26.43	31.189	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 A04	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	33.269	-45.6	2.19	RCP 4
S3 to S4	300	46.94	31.144	31.85	-35.3	2.83	RCP 4
U1 to S3	300	19.5	31.863	33.186	-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	31.873	30.642	-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	31.714	30.555	-200	0.5	RCP 4
AO2 to S9	375	54.63	34.573	30.236	-162.3	0.62	RCP 4
AI1 to AI2	375	20.79	34.748	30.54	-100	1	RCP 4
AK1 to AI4	375	20.77	34.364	30.156	-100	1	RCP 4
AL1 to AI3	375	20.72	34.558	30.351	-100	1	RCP 4
AN1 to AO10	375	20.82	34.941	30.733	-100	1	RCP 4
AO1 to AO2	375	25.34	33.115	34.857	-98.3	1.02	RCP 4
AO2 to AO3	375	20.29	34.807	34.664	-100	1	RCP 4
AO3 to AO4	375	76.27	34.569	32.513	-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	31.616	30.449	-52.6	1.9	RCP 4
AB2 to AB3	450	26.62	34.489	30.218	-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 AC9	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 AC13	600	40	30.286	30.126	-250	0.4	RCP 4
AO13 to AC14	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 AC16	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)x600	66.01	29.88	29.68	-330	0.3	RCB

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.

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

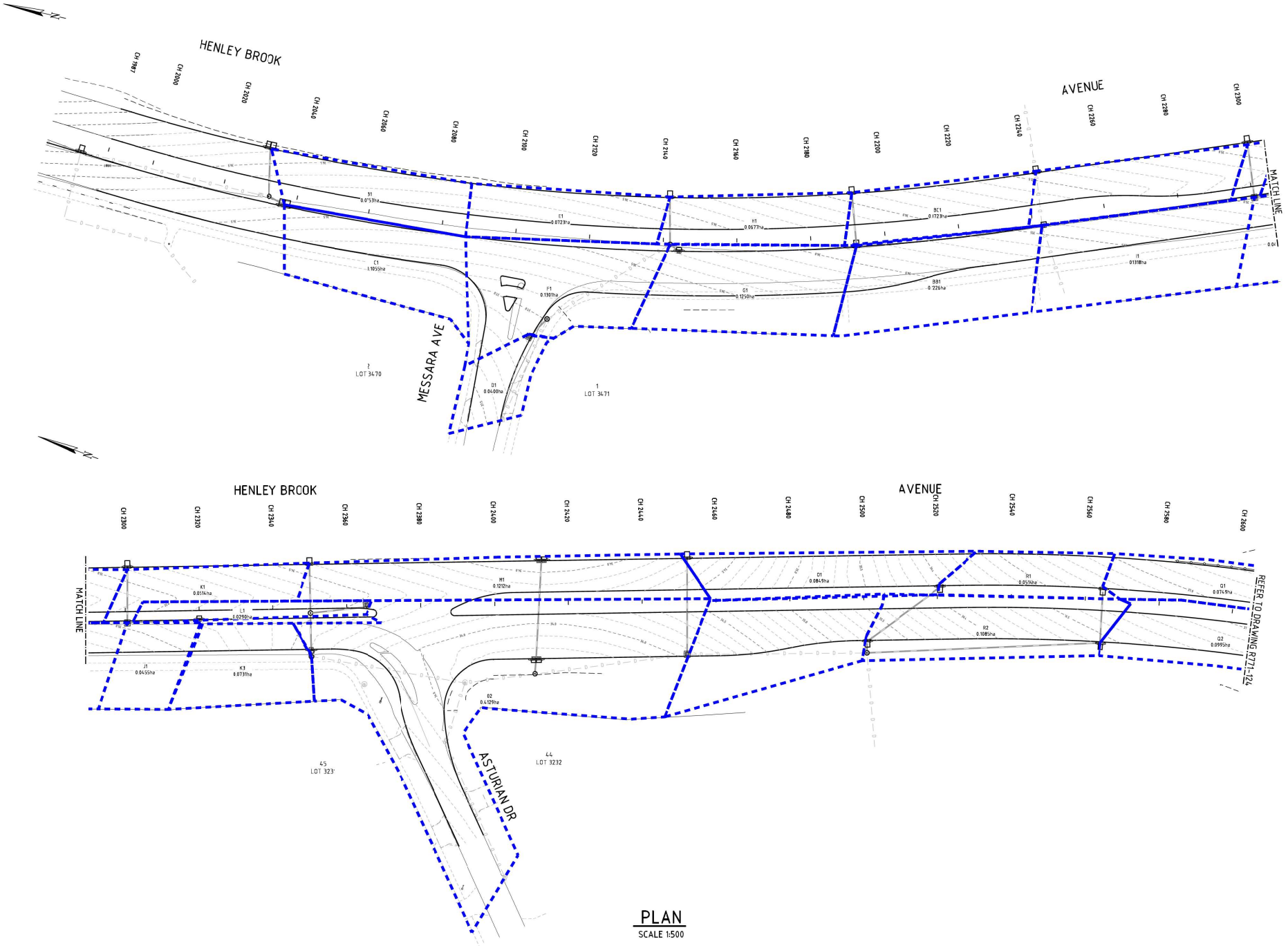
PROFORMCIVIL ENGINEERING GROUP www.proformcivil.com

city of swan

DRAWING No: R771-121

REV No: 0

OPERATIONS



PLAN
SCALE 1:500

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.

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

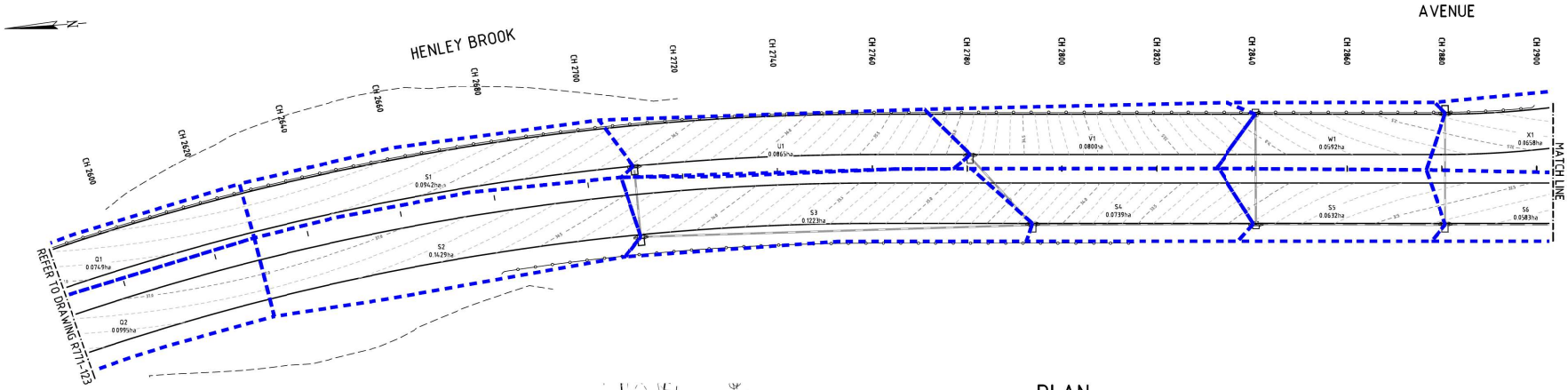
HENLEY BROOK AVE - STAGE 3
MESSARA AVENUE TO PARK STREET
DUAL CARRIAGEWAY
DRAINAGE CATCHMENT PLAN SHEET 1 OF 4

PROFORMCIVIL ENGINEERING GROUP
www.proformcivil.com

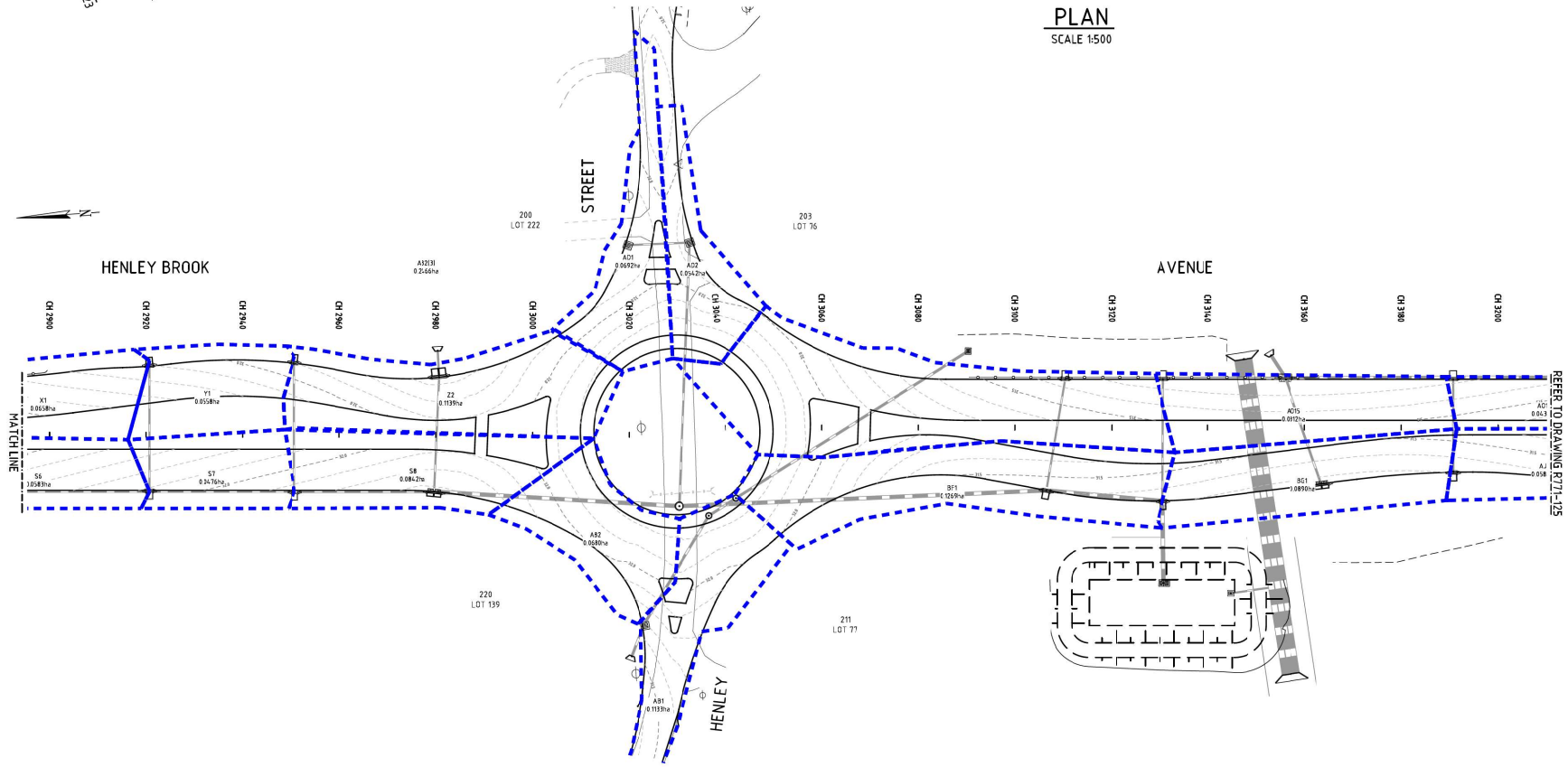
city of swan

DRAWING No: R771-122
REV No: 0

OPERATIONS



PLAN
SCALE 1:500



PLAN
SCALE 1:500

1 : 500

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.

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: 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

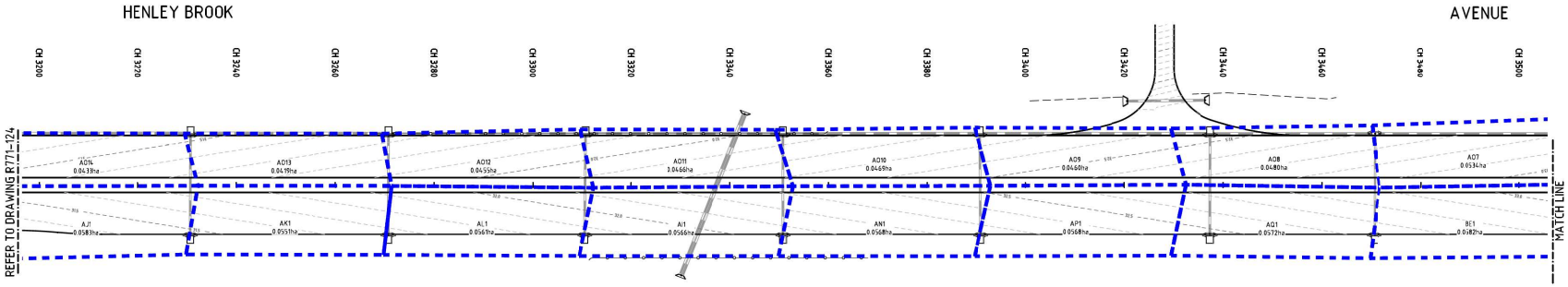
PROFORMCIVIL ENGINEERING GROUP
www.proformcivil.com

city of swan

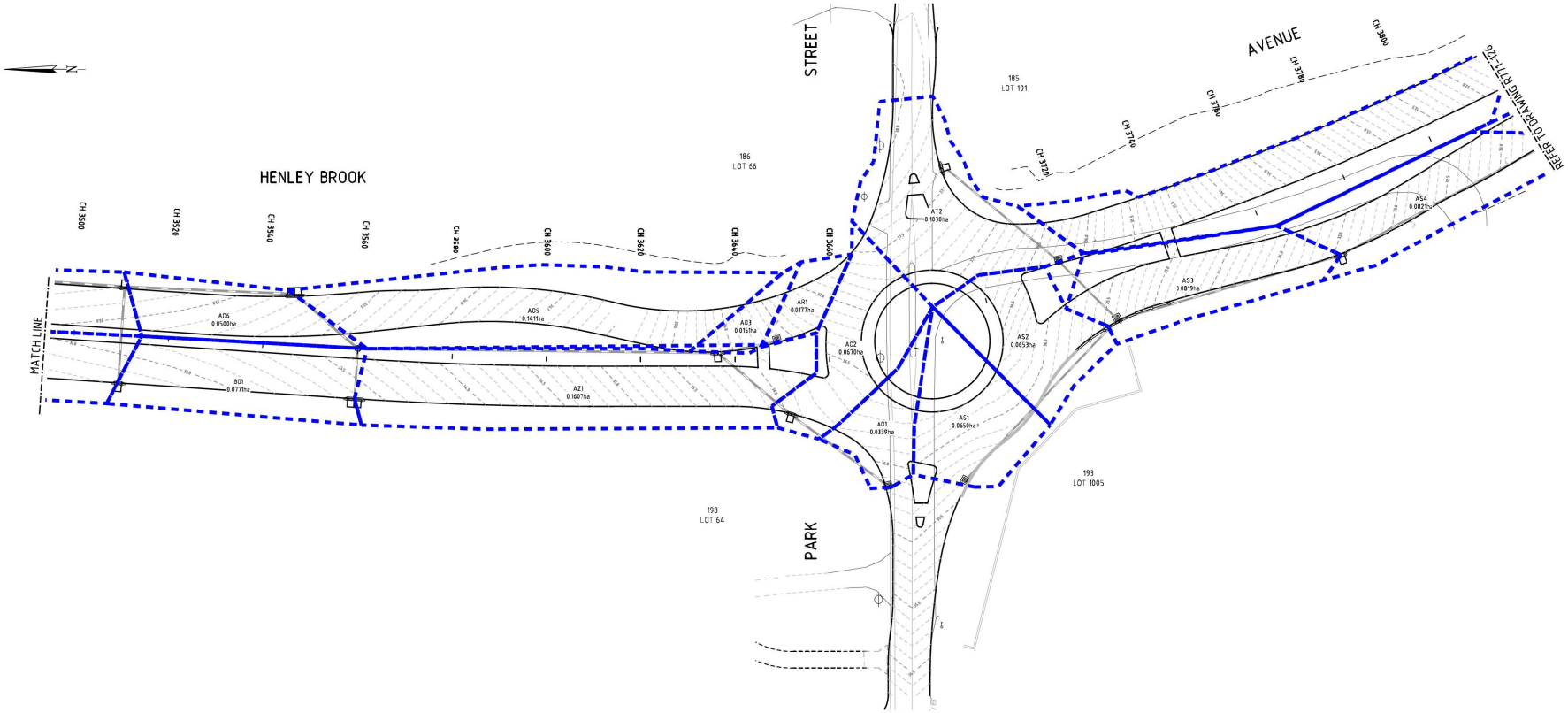
DRAWING No: R771-123

REV No: 0

OPERATIONS



PLAN
SCALE 1:500



PLAN
SCALE 1:500

0 5 10 12.5 15 20m
1 : 500

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.

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: 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

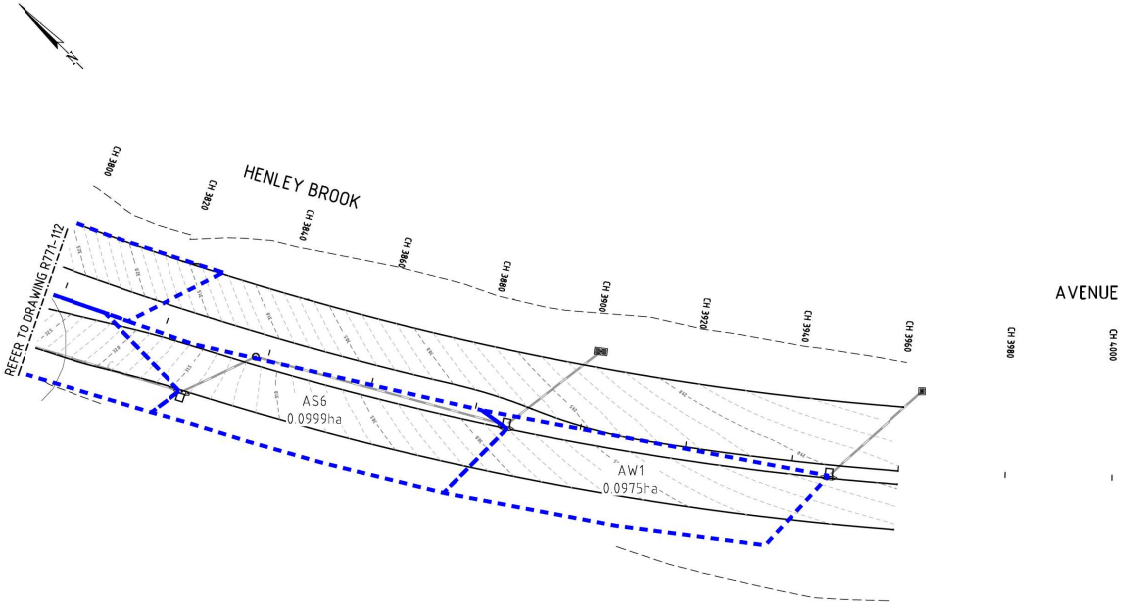
PROFORMCIVIL
ENGINEERING GROUP
www.proformcivil.com

city of swan

DRAWING No: R771-124

REV No: 0

OPERATIONS



0 5 10 12.5 15 20m
1 : 500

PLAN
SCALE 1:500

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.

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: 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

PROFORMCIVIL ENGINEERING GROUP
www.proformcivil.com

city of swan

DRAWING No: R771-125
REV No: 0

OPERATIONS

HYDRAULICS Q10 (10% 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=CA	Catchment Flow Q:	Direct Flow Qdg	Approach Flow Qa	Road Capacity	Flooded Depth	Flooded Width	Flooded Vel.Jep	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)	(m)	(m)	(sq.m/s)	(%)	(%)	(m)	(-)	(-)	(L/s)	(L/s)	(-)
A1	SEP	65368.86	7804.99.42	36.16	36.16	36.16																	0											0		-
A2	MH	65371.15	7805.02.61	36.16	36.06	36.06																														-
AB1	HW	65486.16	7794.92.43	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	7794.89.75	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	7794.74.46	32.37	32.37	32.37																														-
AB4	MH	65517.33	7794.68.57	32.39	32.39	32.39																														-
AB5	GULLY	65544.37	7794.18.43	31.54	31.54	30.55																														-
AD1	GULLY	65571.33	7794.87.82	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	7794.73.87	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	7793398.8	31.35	31.35	31.35																		0					0.8	2.6		1	1G,1.5X	0		AG1
AG1	SEP	65535.73	7793378.53	31.24	31.24	31.24																		0					0.4	3		1	0.5G,3.0X	0		AG15
AH1	HW Triple	65472.95	7793356.43	29.88	33	30.88																														-
AH2	HW outlet Triple	65538.75	7793361.72	29.68	31.2	30.68																														-
AJ1	SEP	65502.9	7792.00.58	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	0.12	0.5	3		1	0.5G,3.0X	16.7	0.4	AL1
AJ1	SEP	65512.36	7793319.99	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	0.12	0.4	3		1	0.5G,1.5X	15.5	2	BG1
AK1	SEP	65508.83	7792.80.22	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	0.12	0.5	3		1	0.5G,3.0X	16.3	0.3	AJ1
AL1	SEP	65506.05	7792.40.31	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	0.12	0.5	3		1	0.5G,3.0X	16.5	0.4	AK1
AM1	HW Double	65493.63	7791.81.58	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	7791.66.53	30.17	30.95	30.95																														-
AN1	SEP	65500.49	7791.60.43	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	0.12	0.5	3		1	0.5G,3.0X	16.9	0.5	AI1
AO1	GULLY	65467.16	7788839.28	35.83	35.83	35.83	1I	Direct				5	117.65	0.9	0.0339	0.0305	11.8964	1420.2	0.0305	1.3748	612.7	1420.2		1420.2	1579.1	0.146	3.96	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	7788859.15	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	0.12	2.7	1.9		1	2G,1.5X	13.9	5.8	AZ1
AO3	SEP	65495.39	7788874.71	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	0.11	3.9	1		1	4G,0.5X	3.6	0.9	LOST
AO4	MH	65496.55	7788950.97	33.78	33.78	33.78																														-
AO5	SEP TWIN	65507.66	7788964.22	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	0.14	1.5	3		1	2G,3.0X	29.6	11.9	AO6
AO6	SEP	65509.37	7790000.2	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	0.13	0.6	3		1	0.5G,3.0X	23	3.6	AO7
AO7	SEP	65512.51	7790139.32	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	0.12	0.5	3		1	0.5G,3.0X	18.5	0.9	AO8
AO8	SEP	65514.42	7790172.59	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	0.12	0.5	3		1	0.5G,3.0X	15		AO9
AO9	SEP	65517.66	7791119.16	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	0.12	0.5	3		1	0.5G,3.0X	13.5		AO10
AO10	SEP	65520.44	7791159.06	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	0.12	0.5	3		1	0.5G,3.0X	13.8		AO11
AO11	SEP	65523.22	7791198.96	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	0.12	0.5	3		1	0.5G,3.0X	13.7		AO12
AO12	SEP	65526	7792238.87	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	0.12	0.5	3		1	0.5G,3.0X	13.4		AO13
AO13	SEP	65529.22	7792278.74	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	0.12	0.5	3		1	0.5G,3.0X	12.3		AO14
AO14	SEP	65531.56	7793318.67	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	0.12	0.5	3		1	0.5G,3.0X	12.7		AO15
AO15	COMBO SEP TWIN	65533.97	7793353.34	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	7793355.93	29.7	31.2	31.2																														-
AP1	SEP	65497.7	7791120.4	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	0.12	0.5	3		1	0.5G,3.0X	17.5	0.6	AN1
AQ1	SEP	65494.47	7790174.03	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	0.12	0.5	3		1	0.5G,3.0X	19.6	1.4	AP1
AR1	GULLY	65497.64	7788862.01	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	3.89	0.11	3.9	2.3		1	4G,1.5X	5.1	0.1	AO3
AS1	GULLY	65468.1	7788821.88	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	7787189.94	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	0.13	3.9	2.8		1	4G,1.5X	13.7	5.5	AS3
AS3	SEP	65515.67	7787421.79	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	0.14	3.7	3.1		1	4G,3.0X	17.9	11.8	AS4
AS4	SEP	65541.56	7786941.49	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	0.13	3	1.5		1	2G,1.5X	18.8	17.1	AS6
AS5	MH	65555.9	7786894.3	31.3	31.3	31.3																														-
AS6	SEP	65579.52	7786461.89	29.81	29.81	29.81	1I	Direct				5	117.65	0.9	0.0999	0.0899	0.0859	29.4	0.0899	0.0899	29.4	29.4		46.5	633.5	0.055	1.92	0.15	2.1	3		1	2G,3.0X	26	20.6	AW1
AS7	GULLY TWIN	65602.37	7786444.4	28.76	28.76	28.76																														-
AT1	SEP	65534.28	7788827.3	37.6	37.6	37.6																		0					2.5	3		1	2G,1.5X	0		LOST
AT2	GULLY	65514.31	7788802.33	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	1.72	0.19	4.2	2.6		1	4G,1.5X	20.1	10.2	LOST
AW1	SEP	65615.78	7785197.47	29.05	29.05	29.05	1I	Direct				5	117.65	0.9	0.0975	0.0878	32.9995	1032.9	0.0878	0.7521	2458	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	7785196.7	28.15	28.15	28.15																														-
AZ1	SEP TWIN	65485.95	7785951.69	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	0.15	2	3		1	2G,3.0X	34.2	18.9	BD1
B1	SEP TWIN	65381.44	7804.49.66	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	0.13	0.8	3		1	1G,1.5X	19.1	3.1	LOST
BB1	COMBO SEP	65408.88	7802.40.86	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	0.15	0.9	3		0.61	1G,3.0X	21.5	33.2	J2
BB2	MH	65409.58	7802.42.28	35.69	35.69	35.69																														-
BC1	SEP	65422.38	7802.46.13	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	0.13	1	3		1	1G,3.0X	21.3	5.8	I1
BC2	MH	65423.87	7802.47.73	35.44	35.44	35.44																														-
BD1	SEP	65489.42	7790015.59	32.82	32.82	32.82	1I	Direct				5	117.65	0.9	0.0771	0.0694	0.0654	22.7	0.0694	0.0694	22.7	22.7		41.5	482.9	0.069	2.49	0.13	0.5	3		1	0.5G,3.0X	30.6	10.9	BE1
BE1	SEP	65492.15	7790040.81	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	0.13	0.5	3		1	0.5G,3.0X	23.8	4.2	AQ1
BF1	GULLY	65490.55	7793367.73	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	7793359.76	30.6	31.86	31.2																														-
BG1	COMBO SEP TWIN	65511.88	7793347.43	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	7804.42.53	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	0.13	0.8	3		1	1G,3.0X	27.6	3.4	LOST
Ex J1	MH	65368.75	7804.47.07	36.77	36.57	36.57																														-
D1	GULLY	65347.56	7803694	37.08	37.08	37.08	1I	Direct				5	117.65	0.9	0.04	0.036	0.035	11.8	0.036	0.036	11.8	11.8		11.8	238.5	0.021	2.96	0.11	1.3	1		1	1G,0.5X	6.7	5.1	LOST
D2	MH	65353.57	7803663.23	37.08	37.08	37.08																														-
E1	SEP	65393.2	7803412.6	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	0.12	0.7	3		1	0.5G,3.0X	19.8	1.5	H1
Ex Ak3	MH	65380.84	7803338.34	36.77	36.77	36.77																														-
F1	COMBO SEP	65379.58	7803335.58	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	0.14	0.9	3.5		1	1G,3.0X	27	11.3	G1
G1	SEP	65391.73	7802289.01	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	0.14	0.9	3.5		1	1G,3.0X	29.4	18.6	BB1
G2	MH	65391.42	7802290.03	35.87	35.87	35.87																														-
H1	SEP	65405.51	7802293.54	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	0.13	1	3		1	1G,1.5X	15.6	5.8	BC1
I1	SEP	65443.4	7801926.46	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	0.14	1	3		1	1G,3.0X	28.4	16.2	K1
J1	COMBO SEP	65436.92	7801069.22	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	0.12	0.9	2.2		1	1G,1.5X	15.1	7.6	LOST
J2	GULLY	65429.8	7801874.3	34.94	34.94	34.94																		33.2	2584.7	0.057	2.01	0.13	0.9	3		1	1G,3.0X	23.9	9.3	J1
K1	SEP	65461.39	7801146.51	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	0.13	1	3		1	1G,3.0X	23.5	7.8	M1
K2	MH	65449.14	7801141.65	34.71	34.71	34.71																														-
K3	COMBO SEP	65440.01	7801138.03	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	0.11	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	0.11	1.1	2		1	1G,1.5X	6.8	1.7	LOST
M1	COMBO SEP TWIN	65484.27	7800888.05	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	7800880.13	33.71	33.71	33.71																		28.8	1540.7	0.076	2.74	0.12	0.1	3		1	0.5G,3.0X	28.8		LOST
M3	MH	65454.96	7800879.02	33.71	33.71	33.97																														-
N1	HW	65521.81	7790975.98	31	31.86	31.86																		0										0		-
N2	HW outlet	65522.52	7790888.07	30.93	31.79	31.79																														-
O1	SEP	65498.65	7800851.33	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	0.13	2	2.6		1	2G,1.5X	15.5	9.5	LOST
R1	SEP	65515.67	7799984.54	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	0.12	2.1	2		1	2G,1.5X	13.6	5.4	LOST
R2	SEP	65494.91	7799997.78	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	0.15	2.4	3		1	2G,3.0X	24.7	17.7	M2
Q1	SEP	65530.46	7799942.86	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	0.13	1.2	3		1	1G,3.0X	18.2	3.8	R1
Q2	SEP	65516.35	7799938.44	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	0.13	1.2	3		1	1G,1.5X	18.7	10.6	R2
Q3	MH	65491.73	7799996.69	35.23	35.23	35.4																														-
Q5	MH	65469.14	7799984.94	35.28	35.28	33																														-
S1	SEP	65554.08	7799799.17	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	0.13	1.6	3		1	2G,3.0X	19.1	8.6	U1

DIAL BEFORE YOU DIG www.1100.com.au

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.

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 HYDRAULICS Q10

PROFORMCIVIL ENGINEERING GROUP www.proformcivil.com

city of swan

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	Foad	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	Xfal	Depth	Factor	Curve Name	Flow Qg	Flow Qb	Node
(-)	(-)	(m)	(n)	(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	65361.86	280459.42	36.16	36.16	36.16																		0										0		-
A2	MH	65371.15	280542.61	36.16	36.06	36.06																														-
AB1	HW	65486.16	279452.43	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	16.9029	6.7612			0.103																				
AB2	GULLY	65412.2	279449.75	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	3011		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			0.0133																				
AB3	MH	65514.09	279474.46	32.37	32.37	32.37																														-
AB4	MH	65511.33	279448.57	32.39	32.39	32.39																														-
AB5	GULLY	65541.37	279478.43	31.54	31.54	30.55																														-
AD1	GULLY	65571.33	279437.82	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	197	0.044					0.3	1		20.4		LOST
AD2	GULLY	65571.94	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	197	0.018					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		A015
AH1	HW Triple	65472.95	279316.43	29.88	33	30.88																														-
AH2	HW outlet Triple	65533.75	279341.72	29.68	31.2	30.68																														-
AI1	SEP	65552.9	279260.58	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	AI.1
AJ1	SEP	65511.36	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	0.012	1.9	0.02	0.4	3		1	0.5G,1.5X	15.5	2	BG1
AK1	SEP	65501.83	279260.22	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	65505.05	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	65491.63	279161.58	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	65521.35	279166.53	30.17	30.95	30.95																														-
AN1	SEP	65504.49	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	278819.28	35.83	35.83	35.83	1I	Direct				5	117.65	0.9	0.0339	0.0305	11.8964	14.20.2	0.0305	1.8748	612.7	14.20.2		4.20.2	1579.1	0.146	5.96	0.36	3.2	1		1	4G,0.5X	74	134.6.2	LOST
							3P	Kinematic Wave	100	2.5	0.25	32.17	42.98	0.4	29.6648	11.8659			1.8443																				
AO2	SEP	65487.53	278819.15	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	0.012	1.74	0.02	2.7	1.9		1	2G,1.5X	13.9	5.8	AZ1
AO3	SEP	65491.39	278814.71	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	3148.7	0.014	1.53	0.01	3.9	1		1	4G,0.5X	3.6	0.9	LOST
AO4	MH	65491.55	278850.97	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	0.016	1.95	0.04	1.5	3		1	2G,3.0X	29.6	11.9	AO6
AO6	SEP	65501.37	279020.2	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	0.019	2.06	0.03	0.6	3		1	0.5G,3.0X	23	3.6	AO7
AO7	SEP	65511.51	279019.32	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	0.012	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	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	65511.66	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		A010
A010	SEP	65524.44	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		A011
A011	SEP	65523.22	279158.96	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		A012
A012	SEP	65526	279218.87	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		A013
A013	SEP	65521.22	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		A014
A014	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		A015
A015	COMBO SEP TWIN	65533.97	279313.34	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	16.8	0.016					0.045	1		23.9		-
A016	HW outlet	65519.1	279315.93	29.7	31.2	31.2																														-
AP1	SEP	65467.7	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	0.043	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	1568.9	0.02	0.89	0.01	3.9	2.3		1	4G,1.5X	5.1	0.1	AO3
AS1	GULLY	65468.1	278811.88	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	65501.03	278769.94	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	7473.4	0.015	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	65504.56	278656.49	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	2194.8	0.014	2.73	0.03	3	1.5		1	2G,1.5X	18.8	17.1	AS6
AS5	MH	65515.9	278659.43	31.3	31.3	31.3																														-
AS6	SEP	65571.52	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	278654.4	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	278812.33	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	0.045	0.72	0.09	4.2	2.6		1	4G,1.5X	20.1	10.2	LOST
AW1	SEP	65611.78	278517.47	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	397.9	0.15	5.81	0.4	0.6	3		1	0.5G,3.0X	105	94.8.5	LOST
							3P	Kinematic Wave	624.5	0.6	0.25	247.65	11.27	0.4	82.2567	32.9027			0.6643																				
AW2	GULLY	65631.59	278596.7	28.15	28.15	28.15																														-
AZ1	SEP TWIN	65485.95	278911.69	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	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	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	6316.1	0.05	1.75	0.03	0.8	3		1	1G,1.5X	19.1	3.1	LOST
BB1	COMBO SEP	65403.88	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	5409.6	0.049	2.42	0.05	0.9	3		0.61	1G,3.0X	21.5	33.2	..2
BB2	MH	65403.58	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	1
BC2	MH	65423.87	280247.73	35.44	35.44	35.44																														-
BD1	SEP	65483.42	279091.59	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	0.049	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	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	0.019	2.14	0.03	0.5	3		1	0.5G,3.0X	23.8	4.2	AQ1
BF1	GULLY	65493.55	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	279319.76	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	15.3	0.042					0.047	1		28.2		-
E1	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	5475.7	0.016	1.97	0.03	0.8	3		1	1G,3.0X	27.6	3.4	LOST
Ex J1	MH	65361.75	280417.07	36.77	36.57	36.57																														-
D1	GULLY	65347.56	280359.4	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	65351.57	280316.23	37.08	37.08	37.08																														-
E1	SEP	65393.2	280311.26	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	65381.84	280318.34	36.77	36.77	36.77																														-
F1	COMBO SEP	65371.58	280315.58	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	2175.7	0.011	2.12	0.04	0.9	3.5		1	1G,3.0X	27	11.3	G1
G1	SEP	65391.73	280249.01	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	2195.4	0.046	2.31	0.04	0.9	3.5		1	1G,3.0X	29.4	18.6	BB1
G2	MH	65391.42	280210.03	35.87	35.87	35.87																														-
H1	SEP	65405.51	280213.54	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	280152.46	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	0.043	2.2	0.04	1	3		1	1G,3.0X	28.4	16.2	K1
J1	COMBO SEP	65435.92	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	2197.2	0.045	2.07	0.02	0.9	2.2		1	1G,1.5X	15.1	7.6	LOST
J2	GULLY	65439.8	280187.43	34.94	34.94	34.94																														-
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	0.018	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	0.018	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	10.7	0.013					0.071	1		43.4		LOST
M2	COMBO SEP TWIN	65453.92	280010.13	33.71	33.71	33.71																		28.8	1140.7	0.016	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	65521.52	279088.07	30.93	31.79	31.79																														-
O1	SEP	65493.65	280011.33	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	65511.67	279961.54	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	1118.1	0.014	1.74	0.02	2.1	2		1	2G,1.5X	13.6	5.4	LOST
R2	SEP	65494.91	279917.78	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	1179.4	0.013	1.85	0.05	2.4	3		1	2G,3.0X	24.7	17.7	M2
Q1	SEP	65539.46	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	65514.35	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	279916.69	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.

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 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)
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
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
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
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
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
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
AF1 to S10	RCP 4	23.33	300	0.071	1	100										0		0		96.7	0	0
AG1 to S11	RCP 4	25.71	300	0.071	1	100										0		0		96.7	0	0
AH1 to AH2	RCB	66.01	(3x)x600	2.16	0.3	330									1440	1440		1440		3127.9	0.46	0.67
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
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
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
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
AM1 to AM2	RCP 4	35.11	(2x)375	0.221	0.56	179.7	229.3	19.1	8.3737	444.2	229.3	19.1	8.3737	444.2		444.2		444.2		261.7	1.7	2.01
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
AT1 to AT2	RCP 4	31.26	300	0.071	6.08	16.4										0		0		238.6	0	0
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
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
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
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
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
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
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
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
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
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
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
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
H1 to G1	RCP 4	14.65	300	0.071	1	100	5	214.27	0.0609	36.2	5	214.27	0.0509	36.2		36.2	-16	20.2		96.7	0.21	0.29
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
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
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
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
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
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
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
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
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
N1 to N2	HDPE SN8	12.12	450	0.159	0.58	173.8										0		0		216.4	0	0
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
Z1 to Z2	RCP 4	5.47	300	0.071	4.57	21.9										0		0		206.9	0	0
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

Pipe ID (-)	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	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	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	2.33	2.43	1.28	32.37	29.38	29.34	32.39	0.7	2.51	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	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	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	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	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	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	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	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	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	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	1.22	0.96	1.59	31.66	30.56	30.35	31.66	0.7	0.7	-90.1	0.065	9.7		0	0.04		0.01	31.03	30.99	30.98	30.98	0.03	2877.5	0.3	0.63
AM1 to AM2	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	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	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	1.23	0.98	1.59	36.03	34.81	34.6	35.87	0.7	0.79	-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	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	0	2.19	34.95	34.94	32.64	32.3	3.02	33.1	0.3	0.92
AO4 to AO5	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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.

DIAL BEFORE YOU DIG www.1100.com.au

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: (A1)

DATUM: A.H.D.

HENLEY BROOK AVE - STAGE 3

MESSARA AVENUE TO PARK STREET

DUAL CARRIAGEWAY

DRAINAGE HYDRAULICS Q100

PROFORMCIVIL ENGINEERING GROUP www.proformcivil.com

city of swan

DRAWING No: R771-128

REV No: 0

OPERATIONS

HYDROLOGY Q100 (1% 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 VelDep (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	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	1I	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	1I	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	1I	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	1I	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	1I	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,1.5X	25.7	40	BG1
AK1	SEP	65508.83	279280.22	31.47	31.47	31.47	1I	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	1I	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	1I	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	1I	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	1I	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	1I	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	1I	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	1I	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	1I	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	1I	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	1I	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	1I	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	1I	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	1I	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	1I	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	1I	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	1I	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	1I	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	1I	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	1I	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	1I	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	1I	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	1I	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	1I	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	1I	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	1I	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	1I	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	0.88	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	1I	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	1I	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	1I	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	1I	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	1I	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	1I	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	1I	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	1I	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	1I	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	1I	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	1I	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	1I	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	1I	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	1I	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	1I	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	1I	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	1I	Direct				5	214.27	0.9	0.0514	0.0462	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	1I	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	1I	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	1I	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	1I	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	16.9	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	1I	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	1I	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	1I	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	1I	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	1I	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	1I	Direct				5	214.27	0.9	0.1429	0.1286	0.1286	76.6	0.1286	0.1286	76.6	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	1I	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	1I	Direct				5	214.27	0.9	0.0739	0.0665	0.0665	39.6	0.0665	0.0665	39.6	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	1I	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	1I	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	1I	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	1I	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																													-

DIAL BEFORE YOU DIG
www.1100.com.au

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

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 HYDROLOGY Q100

PROFORMCIVIL
ENGINEERING GROUP
www.proformcivil.com

city of swan

DRAWING No: R771-129

REV No: 0

OPERATIONS

Figures