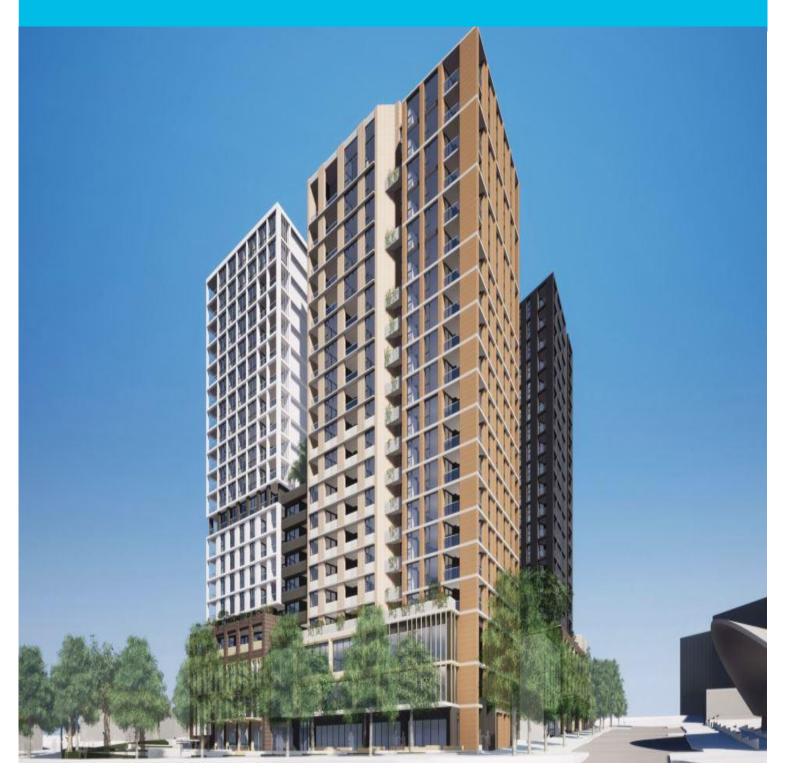


Doran Drive Precinct Deicorp 10-Jun-2022

Stormwater Management Plan

Doran Drive Precinct



Stormwater Management Plan

Client: Deicorp

ABN: 73 630 425 955

Prepared by

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10-Jun-2022

Job No.: 60618532

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Quality Information

Document	Stormwater	Management Plan
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Ref 60618532

Date 10-Jun-2022

Prepared by Chris Roberts

Reviewed by Gijs Roeffen

Revision History

Rev Revision Date Details		Authorised		
T(C)			Name/Position	Signature
T1	1-June-2021	Issue for Review	Gijs Roeffen Principal Civil Engineer - Urban Development	
T2	1-July-2021	Issue for Development Application	Gijs Roeffen Principal Civil Engineer - Urban Development	
Т3	14-October-2021	Amended and Reissued for Development Application	Gijs Roeffen Principal Civil Engineer - Urban Development	
T4	13-April-2022	Amended and Reissued for Development Application	Gijs Roeffen Principal Civil Engineer - Urban Development	
T5	20-April-2022	Amended and Reissued for Development Application	Gijs Roeffen Principal Civil Engineer - Urban Development	
Т6	01-June-2022	Amended and Reissued for Development Application	Gijs Roeffen Principal Civil Engineer - Urban Development	
Τ7	10-June-2022	Amended and Reissued for Development Application	Gijs Roeffen Principal Civil Engineer - Urban Development	

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1.0 Introduction

AECOM has been engaged by Deicorp to prepare a Stormwater Management Plan to support the development application for the proposed mixed-use development at Doran Drive Precinct. The proposed scheme has been developed in accordance with Part D Section 19 – Showground Station Precinct of the Hills Shire Council Development Control Plan (DCP) - Control 4.5.3 and the Integrated Water Cycle Management Strategy (WSP, Rev 7).

2.0 Reference Information

Drawing	Title	Revision (Date)	Originator
DA-110-007	GA Plans – Basement 01	22 (21.04.22)	Turner Studios
DA-110-008	GA Plans – Ground Level	29 (21.04.22)	Turner Studios
DA-110-009	GA Plans – Upper Level	26 (21.04.22)	Turner Studios
DA-110-010 to DA 110-021	GA Plans – Level 01 to Level 21	30 (21.04.22)	Turner Studios
DA-110-220	GA Plans – Roof Level	09 (21.04.22)	Turner Studios
PS109693-WSP- REP-01 Rev 7	Hills Showground Station Precinct - Integrated Water Cycle Management Strategy	Rev 7, 09/06/2020	WSP
N/A	Part D Section 19 Showground Station Precinct	Hills DCP 2012	Hills Shire Council
N/A	Design Guidelines Subdivision/Developments	Hills DCP 2012 (Sep, 2011)	Hills Shire Council
5042-20 Detail Survey	Detail Survey @ 2 Mandala Parade, Castle Hill	Rev 3, 19/05/2021	Daw and Walton

The following reference information was used in compiling this report:

3.0 Site Overview

3.1 Site Description

The development site, Lot 55 DP 1253217, 2 Mandala Parade Castle Hill, forms part of the Hills Showground Station Precinct. The site is approximately 7,969 m² and bounded by De Clambe Drive to the north, Andalusian Way to the east, Doran Drive to the West and Mandala Parade to the south. The abounding roads and drainage infrastructure were recently constructed as part of the Hills Showground Precinct as seen in Figure 1 and Figure 2.



Figure 1 De Clambe Drive looking south-east

Figure 2 Doran Drive looking north-east

Deicorp is proposing a mixed-use development incorporating 6 levels of basement carparking, commercial tenancies, internal-communal podium area and residential floors between Levels 3-20. For more information on the architectural plans, refer to Turner Studios for documentation.

3.2 Existing Stormwater Behaviour

The site is currently undeveloped with slopes of up to 8 percent falling from east to west towards Doran Drive (Figure 3). The crossfall from north to south is relatively flat.

The existing landform features depressed swales along both northern and southern boundaries of the site, with inlet pits (Figure 4) situated within these swales to collect runoff. There are currently four pits in total which discharge to the drainage in the road. Two of these pits sit within the northern swale and the other two within the southern swale and connect into public drainage infrastructure (part of Hills Showground Station Precinct works) on De Clambe Drive and Mandala Parade respectively.



Figure 3 Existing landform and depressed swale

Figure 4 Inlet pit within swale

The remaining uncaptured catchment predominantly exhibits overland sheet flow to the western boundary and appears to be collected by inlet pits located within a dish drain on the western side of Doran Drive.

The downstream network from the south side of the site extends west from Mandala Parade and north along Doran Drive, then west on De Clambe Drive. The downstream network from the north side of the site extends one pipe segment west from De Clambe Drive before crossing to the trunkline under the northern side of road. Further downstream, a junction pit connects both the lines from Doran Drive and De Clambe Drive. The network continues west to daylight to a headwall outlet within a vegetated swale, behind the northern kerb treatment on De Clambe Drive. This swale connects into the regional basin which ultimately discharges to Cattai Creek, a tributary of the Hawkesbury River.

Refer to Figure 7 for an illustration of Council GIS drainage network and Figure 5 and Figure 6 for site photos of the headwall outlet and downstream regional basin.





Figure 5 Headwall Outlet to Swale upstream Basin

Figure 6 **Regional Detention Basin**

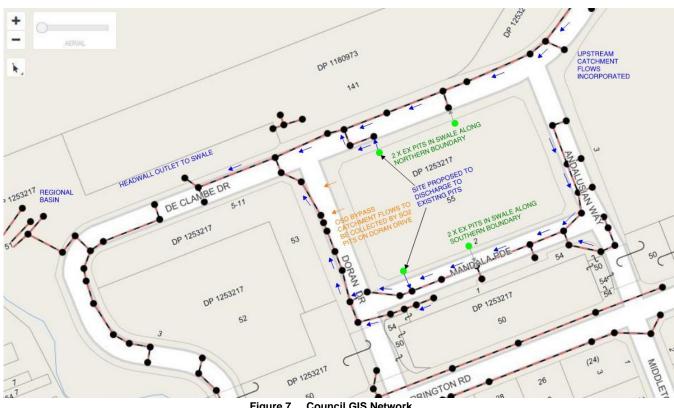


Figure 7 **Council GIS Network**

4.0 Stormwater Management Plan

4.1 Proposed Stormwater Management

Roof water from Buildings A, B, C and D will be collected via the internal building drainage system, with buildings B and C discharging to a proposed rainwater tank below ground level. The rainwater tank will provide re-use for irrigation and planting areas. Basement drainage and overflow from the rainwater tank will be directed to the OSD system before being conveyed to existing drainage infrastructure. The overflow system, internal/building reticulation, basement drainage and rainwater tank design are to be further coordinated the hydraulic consultant during detailed design.

The communal podium catchment area located in the Upper Level will bypass the rainwater tank collection and convey directly to the outlet facilities, either Oceanguard splitter pits or direct to OSD. At the ground level, surface pits in the proposed plaza will capture perimeter runoff and direct surface flows into the OSD. The arrangement of the split systems and catchment directions is presented below in Figure 8.

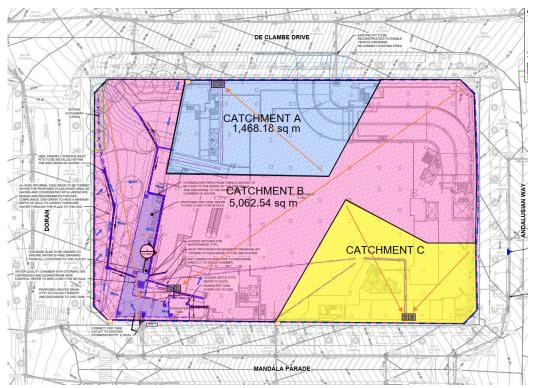


Figure 8 Proposed stormwater network split catchment

As the subject site is located within the Hills Showground Precinct which is serviced by an existing regional basin (depicted in Figure 10); additional on-site detention was confirmed to be not required by Hills Shire Council. Correspondence indicating the in-principle agreement is attached in Appendix A.

DRAINS hydraulic modelling was undertaken to substantiate the capacity of the existing drainage system and its ability to accommodate site flows at existing discharge points on Mandala Parade and De Clambe Drive.

Amplification works within the recently completed public roadworks was not preferred by the project team and as such, OSD has been proposed as part of the stormwater strategy to limit peak site discharge flows only to the level such that the downstream network can accommodate the discharge for events up to the 1% AEP storm. As the stormwater network is intended to be capable of managing the discharge from the lot, the nature of the OSD is to be further coordinated at a later design stage.

4.2 Hydraulic Modelling

A DRAINS hydraulic model was prepared to estimate the capacity in the existing drainage network and incorporates detailed survey of pipe sizes and invert levels. The hydraulic assessment quantifies the developed site flows and ensure that these can be conveyed and accommodated by the existing system without pits surcharging in the major storm event. See Figure 9 for an illustration of the DRAINS model schematic. Flows from external upstream catchments in accordance with the IWCM (WSP, 2020) were also considered. An excerpt of the catchment plan from the IWCM is referenced in Figure 10.

Both the downstream overland flow and external network discharge further downstream along De Clambe Drive to a developed swale and regional basin. The longitudinal fall along De Clambe drive is approximately 4% for more than 100m of road length. As the fall and length to the regional basin is quite significant, tailwater control at the outlet points of the development site have been assumed to be generated from upstream flows rather than downstream water surface levels.

Design Intensity-Frequency-Duration (IFD) Rainfall for the Hawkesbury catchment area in accordance with Table 4.5 of the Design Guidelines Subdivision/Developments (Hills Shire Council, September 2011) was adopted for the model hydrology.

The hydraulic model incorporated roughness coefficients for pipes and blockage provisions for pits in accordance with Table 4.11 and Table 4.10 respectively of Council's Design Guidelines. Pit loss coefficients were refined using QUDM charts within the hydraulic model package.

Table 1	Recommended Pipe Roughness – Hills DCP
	Recommended i ipe Rougimess - Tims Doi

Pipe Material	Recommended K Value (mm)
UPVC	0.03
RCP	0.3

Table 2 Provision for Blockage – Hills DCP

Condition	Pit Type	Theoretical Capacity Allowed
Continuous Grade	Kerb Inlet Pit	90%
Sag	Kerb Sag Pit	80%
Surface Inlet Pit Cover	Surface Inlet Pit	50%

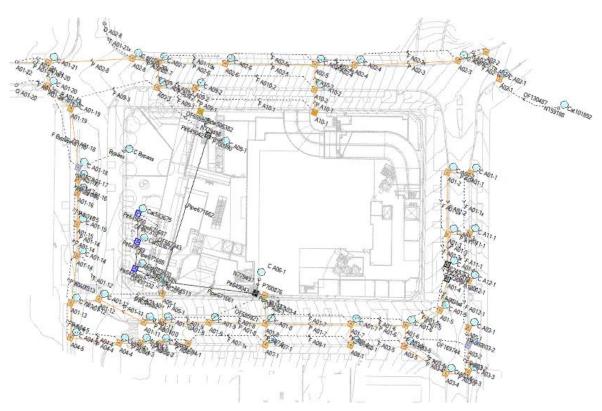


Figure 9 Doran Drive DRAINS Model Schematic



Figure 10 Precinct Catchment Plan – (source: IWCM - WSP, 2020)

4.3 OSD Catchment and Bypass

The site area draining to the proposed On-Site Detention (OSD) system is approximately 7,905 m². The requirement to interface with existing footpath levels at Doran Drive will generate approximately

70 m² of bypass in the north-western portion which can be collected by a combination of subsoil drainage and surface inlet grates to discharge directly to the kerb subject to design development. A catchment plan of the site and bounding roads are depicted in Appendix D.

The external plaza to the west of the OSD is to grade to an informal dish drain formed from locally graded pavers to create a dish 2m wide and 40mm in total depth. Natural grading towards this dish on either side of the plaza will result in this dish capacity being greater than 2m wide and 40mm deep but these limits have been chosen for hydraulic control to limit surface ponding in the plaza. This dish drain will follow the natural topography of the site and flow to the north and will include a series of surface inlet pits that connect to the OSD as shown in Figure 10. The dish drain is to be coordinated with the landscape design of the plaza during detailed design as well as coordinated with requirements for DDA compliance.

The dish drain is nominally sized to capture and contain overland flow across the plaza in the 1% AEP storm event, with the pit and pipe system designed to ensure no surcharge is directed to the street and is instead discharged into the OSD. In the event of surface inlets becoming blocked or inability to drain to the OSD system, overflow from the dish drain will be towards the Doran Drive road reserve. A non-return flap valve at the discharge pit to the OSD will prevent water from the OSD backflowing to the plaza.

4.4 On-Site Detention System

An on-site detention tank is to be installed at the lower south-western portion of the site. It will comprise a total internal footprint area of 274.5 m², comprising of 250 m² for detention storage and 24.5 m² for a water quality chamber. The tank will be situated below ground level with the internal tank base invert level at RL 88.95. The tank will provide sufficient storage volume (approximately 220 m³) for attenuation to ensure developed site for events up to the 1% AEP event are piped without pits surcharging. Structural elements, filter cartridges, internal weir walls and base screed of the OSD tank is expected to take up some of the internal volume and can be confirmed in detailed design. Contingency to the expected loss of storage has been provided via additional capacity above the resultant 1% AEP water surface level.

A DRAINS schematic of the post-developed hydraulic grade line demonstrates available freeboard in the existing network and is illustrated in plan in Figure 11 and section in Figure 12.

It is expected that the roof of the OSD will need to be amended to allow for plaza pavement and modelling indicates there is room for the OSD roof to be lowered to meet this requirement. Further hydraulic modelling will be required at a later design phase to confirm this.

Resulting comparison of pre and post peak site discharges for minor and major systems are summarised in the table below.

Peak Flow (L/s)			
10%	AEP	1% AEP	
Pre	Post	Pre	Post
179	183	310	276

Table 3 Peak flow comparison (minor and major systems)

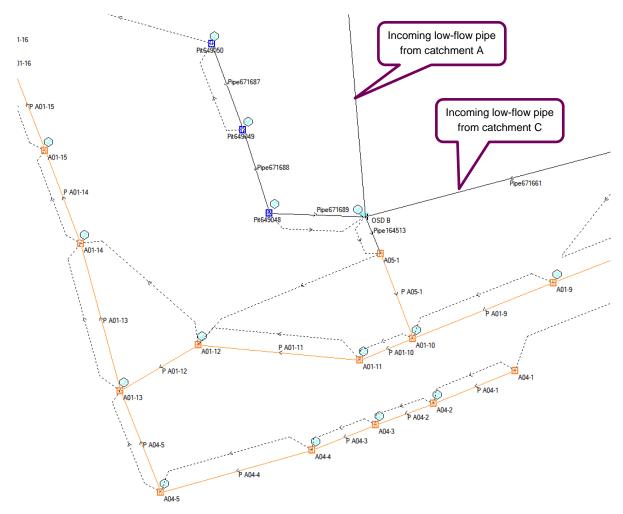


Figure 11 OSD Outflow in the 1% AEP Event – DRAINS Model Plan

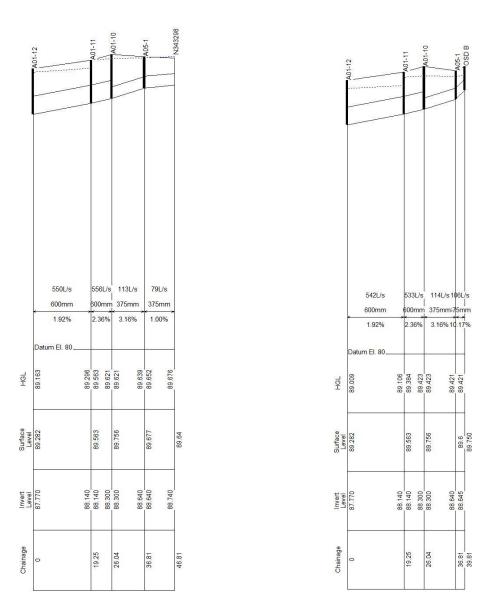


Figure 12 OSD Outflow in the 1% AEP Event (Pre-development = Left, Post-development = Right) – DRAINS Model Long Section

An additional water quality treatment chamber is to be built within the OSD footprint. Details of the treatment chamber are discussed in Section 5.3.

The outlet configuration of the detention tank will incorporate a 375 mm outlet pipe with a 250mm diameter orifice for flow control. This outlet pipe will connect to an existing pit within the south-western low point of the site. This pit discharges to an existing 375 mm diameter pipe crossing under the Council verge which immediately continues into a 600 mm RCP trunkline within the road in Mandala Parade.

A non-return valve will be required to be installed on all outlet points, including the OSD pipe, to ensure the site discharges freely to the existing road drainage system without being excessively burdened by downstream tailwater or hydraulic grade conditions.

For rainfall events in excess of the major storm; emergency overflows will escape from the tank access hatches located and be conveyed over the verge to be collected by the Doran Drive drainage infrastructure and road network.

Refer to Appendix D for OSD, and stormwater plan drawings including nominated point of discharge.

5.0 Water Sensitive Urban Design Strategy

5.1 WSUD Strategy

A Water Sensitive Urban Design Strategy has been prepared to support the development application in accordance with Part D Section 19 – Showground Station Precinct of the Hills Shire Council Development Control Plan (DCP) – Controls 4.5.7 to 4.5.12. The strategy takes into the account prescribed water quality objectives and adopts modelling parameters as recommended by the guidance in the DCP.

The proposed stormwater treatment train will incorporate a combination of rainwater reuse, gross litter baskets, treatment chamber including filter cartridges, and tree pits. Stormwater runoff will be captured, reticulated, and treated within the development site before discharging to the public drainage system. Details of the treatment devices are discussed in Section 5.3.

The system is based on a low-flow/high-flow splitter method with all site catchments being diverted to the centralised WSUD chamber treatment train and high-flow bypasses discharging excess clean stormwater in higher storm events direct to the existing road drainage system. This allows for minimising OSD storage while providing treatment in a central location for ease of maintenance.

The specific locations for each of these splitter pit systems will need to be coordinated further with architectural and building hydraulics at a later design phase as they have only been notionally positioned for ease of access.

Water quality modelling has been undertaken utilizing the MUSIC version 6.3 and in line with the Draft NSW MUSIC Modelling Guidelines, Sydney Metropolitan Catchment Management Authority, 2010. Modelling parameters have been adopted as per the *Hills DCP 2012 – Showground Precinct*, details of which are discussed in Section 5.3.

5.2 Pollutant Reduction Targets

The water quality performance objectives with reference to Table 3 of the Showground Station DCP are summarised in the table below:

	Water Quality % Reduction in Pollution Loads			
	Gross Pollutants (>5mm)	Total Suspended Solids	Total Phosphorus	Total Nitrogen
Stormwater Management Objective	90	85	65	45

5.3 Proposed Treatment Train

A variety of treatment devices have been proposed to formulate the treatment train strategy and achieve the required pollutant reduction. These devices are discussed below:

Water Quality Chamber and Stormfilter Cartridges

A water quality chamber with approximately 20 x 310mm PSorb filter cartridges will be situated within the OSD tank bounded by an internal weir of approximately 540 mm height and controlled by low-flow outlet. This chamber is intended to provide water treatment for the runoff captured from the hardstand and roof areas prior to discharging to the broader detention facility.

Rainwater Tanks and Re-use

Rainwater Re-use rates provided by the hydraulic consultant have been incorporated into the water quality model to conceptualize the rainwater tank sizing requirements from a water quality perspective.

A typical estimate of 0.4 kL/year/m² for planting areas and 0.1 kL/year/m² for turf or watered landscape areas has been assumed.

• Pit Inserts and Trash rack

Trash racks and litter baskets will be installed where there is sufficient depth to invert at pits and within the OSD to provide pre-treatment of stormwater via enabling the filtering out of gross pollutants.

5.4 MUSIC Modelling

Water quality modelling has been undertaken using the latest model of MUSIC (version 6.3) and demonstrates that the proposed treatment train is able to achieve the pollutant reduction targets as identified in Table 3 of the Showground Station DCP.

The MUSIC model incorporates rainfall and potential evapotranspiration data from 1984-2010 (Sydney). Pollutant and catchment parameters have been adopted in accordance with those outlined in Tables 4 and 5 of the Showground Station DCP. Catchment delineations for types roof, hardstand and landscaped areas were refined and input into the model. Rainwater re-use rates for irrigation of landscape and planting areas provided by the hydraulic consultant were incorporated into the re-use demand parameters of the model. A sensitivity check of the rainwater tank with 10% less storage volume has also been included as part of the assessment.

Table 5 and Table 6 summarises the model parameters adopted for the water quality assessment. A schematic of MUSIC model is illustrated in Figure 13.

	Units	Urban	Non-Urban
Impervious area parameters			
Rainfall threshold	Mm/day	1.4	1.4
Pervious area parameters			
Soil Storage capacity	mm	170	210
Initial Storage	% of capacity	30	30
Field Capacity		70	80
Infiltration capacity coefficient - a		210	175
Infiltration capacity coefficient - a		4.7	3.1
Groundwater properties			
Initial depth	mm	10	10
Daily recharge rate	%	50	35
Daily baseflow rate	%	4	20
Daily deep seepage rate	%	0	0

Table 5 Soil/Groundwater parameters recommended for adoption in MUSIC Modelling – Showground Station DCP

Table 6	Recommended Stormwater	Quality Parameters for MUS	IC Modelling – Showground Station DCP
---------	------------------------	-----------------------------------	---------------------------------------

			Storm	Flow					Base	Flow		
Land use	TS	S	TF	C	1T	N	TS	S	TI	C	1T	N
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
General												
Urban												
Residential	2.15	0.32	-0.60	0.25	0.30	0.19	1.20	0.17	-0.85	0.19	0.11	0.12
Industrial												
Commercial												
Roads	2.43	0.32	-0.30	0.25	0.34	0.19	-	-	-	-	-	-
Roofs	1.30	0.32	-0.89	0.25	0.30	0.19	-	-	-	-	-	-
Forest/Natural	1.60	0.32	-1.10	0.25	-0.05	0.19	0.78	0.17	-1.52	0.19	-0.52	0.12

*All values in log10mg/l

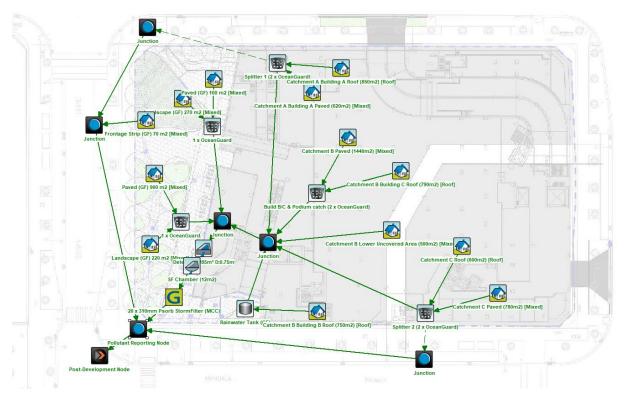


Figure 13 MUSIC Model Schematic

The model results of the proposed treatment train pollutant reduction is summarised in Table 7.

Pollutant (kg/yr)	Source Load	Residual Load	Reduction in Pollutant Sources (%)	Reduction Target (%)	Reduction Target Achieved
Total Suspended Solids	666	91.7	86.2	85	Yes
Total Phosphorus	1.32	0.397	69.9	65	Yes
Total Nitrogen	12.1	5.86	51.7	45	Yes
Gross Pollutants	142	0.573	99.6	90	Yes

Table 7 Pollutant Reduction Model Results

5.5 Erosion and Sediment Control Plan

An Erosion and Sediment Control Plan has been prepared in accordance with "Managing Urban Stormwater – Soils and Construction", to minimise land disturbance and sediment pollution control of downstream waterways. Refer to Appendix D for the civil drawings.

12

Appendix A

On-Site Stormwater Detention Requirements & IFD Data

Ou, Benson

From: Sent: To: Cc: Subject:	Rashad Abboud <rabboud@thehills.nsw.gov.au> Tuesday, 18 May 2021 3:09 PM Ou, Benson Roeffen, Gijs; Cynthia Dugan [EXTERNAL] Email to consultant - Doran Drive Precinct - Confirmation of Regional</rabboud@thehills.nsw.gov.au>
	OSD and site requirements - 2 Mandala Parade CASTLE HILL
Importance:	High

Hi Ben,

As we have discussed on the phone last week, in principle; I agree with the context of your email below. Where a regional basin has been designed/sized to cater for the entire contributing catchment including the subject site, then OSD is not required to be provided with the future development for this subject site. However, the capacity of the stormwater system into which stormwater from the development discharges into, must be checked/analysed. Please note that the check/analysis shall be carried out to the legal point of discharge to ensure that the street pits will not surcharged.

Please let me know if you need any further clarification.

Kind regards



Rashad Abboud

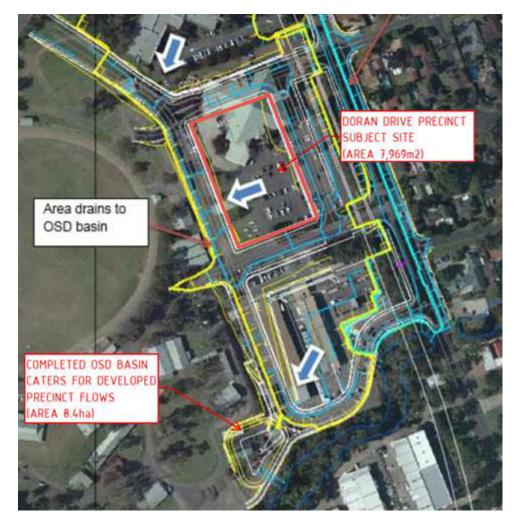
Senior Subdivision Engineer 61298430536 | rabboud@thehills.nsw.gov.au Administration Centre, 3 Columbia Court Norwest NSW 2153 PO Box 7064, NORWEST NSW 2153 | DX 9966 Norwest www.thehills.nsw.gov.au

From: Ou, Benson [mailto:Benson.Ou@aecom.com]
Sent: Friday, 14 May 2021 1:56 PM
To: Rashad Abboud
Cc: Roeffen, Gijs; Cynthia Dugan
Subject: Doran Drive Precinct - Confirmation of Regional OSD and site requirements

Good afternoon Rashad,

Thanks for your time on the phone. Glad we are on the same page. As discussed; we are developing the stormwater management strategy for thew Doran Drive lot at the Showgrounds precinct and are hoping you can provide some information prior to finalisation of our submission. If we could get your confirmation in writing come Monday/Tuesday we can progress to an agreed approach and documentation.

Specifically we are hoping to confirm the OSD requirements for the site in accordance with the IWCM. As part of the Stage 1 DA documentation; we note that the Integrated Water Cycle Management Report as prepared by WSP for the site in 2020 (link to report) finds that the constructed regional basin for the precinct has been sized to cater for the entire Hills Showground Precinct site (8.4 ha) before discharging to Cattai Creek. (OSD called out in bottom left red below and also Figure 3.2 of the report)



Two excerpts of the IWCM report is snipped in below: Section 4.2.1.

4.2.1 ON SITE DETENTION

Council's Design Guidelines Subdivision/Developments (September 2011) provide methods for calculating the permissible site discharge (PSD) and site storage volume (SSV) requirements for development sites. An OSD basin was designed and constructed on site as part of the NRT works (NRT, 2016). The NRT Design Report shows the basin has been designed to have a volume of 2135m³ and sized to cater for the entire site (8.4ha) including the station (section 6.4.3.7 and 6.4.3.12, NRT design report, 2016). No further DA Areas would be connected to the private drainage channel and OSD basin.

Section 4.2 of the WSP Report informs that concentrated flows from the proposed buildings and hardstand surfaces to be collected by the piped stormwater drainage system.

A piped stormwater drainage system will be provided to collect all concentrated flows from the proposed buildings and hardstand surfaces. Most of the Site will drain to the existing OSD basin on the north western boundary before discharge to Cattai Creek, except for a section at the eastern most point of the Site which drains towards Showground Road and Carrington Road and will be captured by two proposed new OSD basins in this DA Area. Consideration will be given to the potential upgrades undertaken by RMS on the drainage system in consequence of the civil and any drainage upgrading works completed within Showground Road. Rock rip rap, gravel and vegetation are provided at the outlet of the drainage system to act as energy dissipators to reduce scour potential.

Furthermore, in the Hills DCP 2012 for the sites within the Hawkesbury River catchment (of which Doran Precinct lies within):

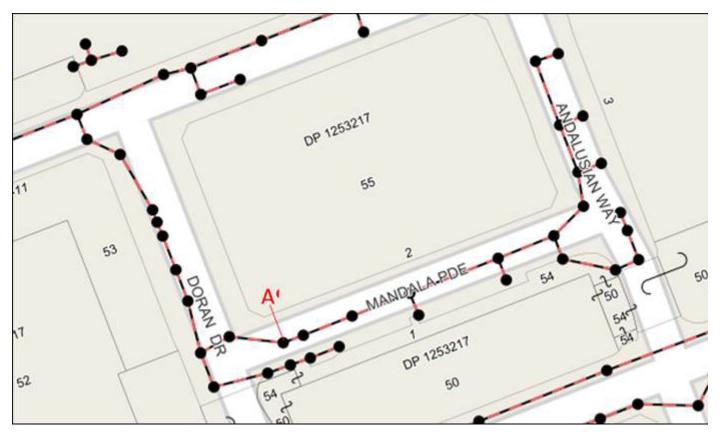
Table 4.14 - PSD and SSV Requirements for the Hawkesbury River Catchment

On-site stormwater detention shall not be provided in catchment areas that drain to an approved detention system. This generally includes new release areas. Council's Subdivision & Development Certification section can advise which catchment applies to the proposed development and the requirement for on-site detention.

Prior to finalising our OSD approach we want to confirm with Council whether the site:

1. does not require OSD. Noting that the information in the Stage 1 DA is demonstrating that the regional basin will already cater for the developed flows of the subject site.

We understand that discharging concentrated flows may require an assessment of the downstream drainage capacity to ensure that it has capacity for the design storm. For reference, we expect the overall site discharge to be in the southwestern corner. Likely through an existing pipe within the property boundary (marked up as 1 below). We will assess the flows and check if the D/S network needs to be amplified or alternative methods.



Cheers,

Benson Ou Civil Engineer M +61 4 6629 7077 benson.ou@aecom.com

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Appendix **B**

DRAINS Modelling Data

PIT / NODE DETAILS Name Type	Version 15 Family Size Pondir		Surface		Blocking	x	у	Bolt-down	id	Part Full		Pit is	Internal		Minor Safe Ma	
A01-1 OnGrade	Volum (cu.m) NSW RTA Single SO1 Pit			Depth (m) Inflow (cu.m/s)	Factor 0 0.	1 313567.8	6266312	lid No	46343995		s Hydrograg	ph Existing	Width (mm)	Misaligned No	Pond Dept Po (m) (m)	
A01-3 OnGrade	NSW RTA Single SO1 Pit NSW RTA Single SO1 Pit NSW RTA Single SO1 Pit	0. 2. 2.	96.393		0 0. 0 0. 0 0.	313568.6		No	46343996 46343997 93687333	1 x Ku	No No No	Existing Existing New		Yes No		
A01-4 OnGrade	Dished Crc DCG96D NSW RTA SA1	1. 0.	2 95.841		0 0. 0 0. 0 0.	313574.7	6266272	No	46343998 46343999	1 x Ku	No No	New Existing		No No		
A01-6 OnGrade A01-7 OnGrade	NSW RTA SA2 NSW RTA Single SO1 Pit	0.	2 94.844 2 93.959		0 0. 0 0.	1 313566.7 1 313547.4	6266250 6266242	No No	46344000 46344001	1 x Ku 1 x Ku	No No	Existing Existing		No		
A01-9 OnGrade	NSW RTA Single SO1 Pit NSW RTA Single SO1 Pit NSW RTA Single SO1 Pit	0. 0.			0 0. 0 0. 0 0.	313497.5	6266223	No	46344002 46344003 46344004	1 x Ku	No No No	Existing Existing Existing		No No No		
A01-11 OnGrade	NSW RTA Single SOT Pit NSW RTA SA2 NSW RTA SA1	1. 0.	6 89.563		0 0. 0 0. 0 0.	1 313474.6	6266214	No	46344004 46344005 46344006	1 x Ku	No No	Existing Existing		Yes		
A01-14 OnGrade	NSW RTA SA2 NSW RTA Single SO1 Pit		0 88.958		0 0. 0 0.	1 313441.5	6266228	No	46344007 46344008	1 x Ku	No No	Existing Existing		No		
A01-16 OnGrade	NSW RTA Single SO1 Pit NSW RTA Single SO1 Pit NSW RTA Single SO1 Pit	0. 0. 0.	3 88.781		0 0. 0 0. 0 0.	1 313433	6266250	No	46344009 46344010 46344011	1 x Ku	No No No	Existing Existing Existing		No No No		
A01-18 Sag A01-19 OnGrade	NSW RTA Double SO NSW RTA Single SO1 Pit	0.3 0.		0.1	0 0. 0 0.	2 313429.6 1 313418.6	6266259 6266278	No No	46344012 46344013	1 x Ku	No No	Existing Existing		No No	0.2	0.15
	NSW RTA SA1 NSW RTA SA2	0.	7 88.775 1 88.725 88.307	i	0 0. 0 0. 0		6266291		46344014 46344015 46344016	1 x Ku	No No No	Existing Existing		No No		
A02-1 OnGrade A02-2 OnGrade	Unlimited Unlimited NSW RTA SA2	2. 1.	1 97.939	1	0 0. 0 0.	1 313564.8	6266349		46344017 46344018	1 x Ku	No No	Existing Existing		No Yes		
A02-4 OnGrade	NSW RTA SA2 NSW RTA SA2 NSW RTA SA2	1. 1.	1 95.35	i	0 0. 0 0. 0 0.	313512		No	46344019 46344020	1 x Ku	No No	Existing Existing		No No		
A02-6 OnGrade	NSW RTA SA2 NSW RTA SA2 NSW RTA SA2		6 94.299 1 91.869 0 90.091	1	0 0. 0 0. 0 0.	313466.4		No	46344021 46344022 46344023	1 x Ku	No No No	Existing Existing Existing		No No No		
A02-8 OnGrade A03-1 OnGrade	NSW RTA SA2 NSW RTA SA2	1. 5.	8 95.626	i	0 0. 0 0.	1 313433.2 1 313589.1	6266258	No	46344024 46344025	1 x Ku 1 x Ku	No No	Existing Existing		Yes No		
	NSW RTA SA2 NSW RTA SA2 NSW RTA SA2	0.3 5.	2 95.635	i	0 0. 0 0. 0 0.	313595.3	6266242	No	46344026 46344027 46344028	1 x Ku	No No No	Existing Existing Existing		No Yes No	0.2	0.15
A03-5 OnGrade A04-1 OnGrade	NSW RTA SA2 NSW RTA Single SO1 Pit	1. 5.	7 94.82 5 90.146		0 0. 0 0.	1 313569.3 1 313493	6266242 6266212	No No	46344029 46344030	1 x Ku 1 x Ku	No No	Existing Existing		No No		
A04-3 OnGrade	NSW RTA Single SO1 Pit NSW RTA SA2 NSW RTA SA2	5. 0. 1.	8 89.529	1	0 0. 0 0. 0 0.	313476.5	6266206	No	46344031 46344032 46344033	1 x Ku	No No No	Existing Existing Existing		No No No		
A04-5 OnGrade	NSW RTA SA2 NSW RTA SA2 NSW RTA Single SO1 Pit	1. 5.	B 89.111		0 0. 0 0. 0 0.	1 313451	6266198	No	46344033 46344037	1 x Ku	No No	Existing		Yes No		
A10-1 OnGrade	NSW RTA Single SO1 Pit Junction Pi Junction Pit or Ma		3 94.595	i i i i i i i i i i i i i i i i i i i	0 0. 0 0.	5 313504.7	6266312	Yes	46344038 46344042	1 x Ku	No No	Existing Existing		No No		
A011-1 OnGrade	NSW RTA Single SO1 Pit NSW RTA Single SO1 Pit NSW RTA Single SO1 Pit	2. 5. 5.	9 96.38		0 0. 0 0. 0 0.	313576.2	6266291	No	46344043 46344044 46344045	1 x Ku	No No No	Existing Existing Existing		No No No		
O A01-20 Node O A02-8 Node			88.775 89.517		0 0	313396.2 313418.2	6266279 6266313		46344046 46344048		No No	5				
N159188 Node Bypass Node Pit649042 OnGrade	Downpipe Downpipe	1.	89.9 5 91.5		0 0 0 0.	313589.4 313443.1 1 313470.4		No	46671224 76451740 2.27E+08	1 x Ku	No No No	New				
Pit649043 OnGrade		0. 1.	6 89.6 5 91.6	i	0 0. 0 0.	1 313509.6	6266240	No	46344035 2.27E+08	1 x Ku	No No	Existing New		No		
Pit649050 Sag Pit649049 Sag Pit649048 Sag	Hinged Pit HPG6060 Hinged Pit HPG6060 Hinged Pit HPG6060	3 1. 3 1. 3 1.	5 89.55	0.1	0 0. 0 0. 0 0.	5 313460.8		No	2.27E+08 2.27E+08 2.27E+08	1 x Ku	No No No	New New New			0.1 0.1 0.1	
A09-1 OnGrade A09-2 OnGrade	Junction Pi Junction Pit or Ma NSW RTA Single SO1 Pit	nhol 5. 5.	9 91.505 9 91.338		0 0. 0 0.	5 313464.6 1 313459.3	6266296 6266303	Yes No	46344039 46344040	1 x Ku 1 x Ku	No No	Existing Existing		No No		
	NSW RTA SA2	0.			0 0.				46344041	1 x Ku 1 x Ku	No No	Existing Existing		Yes		
	Unlimited Unlimited	3.	3 92.2		0 0.	5 313513.1	6266240	NO	40344030	1 1 1 1	NU	Existing		No		
DETENTION BASIN D Name Elev OSD B 88.95	ETAILS Surf. Area Not Used Outlet 273 Orifice	Турі К		Centre RL Pit Famil		x	6266240 y 6266231	HED	Crest RL			5		NO		
DETENTION BASIN D Name Elev OSD B 88.95 89.75 SUB-CATCHMENT DI	ETAILS Surf. Area Not Used Outlet 273 Orifice 273 ETAILS	Турі К	Dia(mm) 260	Centre RL Pit Famil 88.88	y Pit Type	x 313475.2	y 6266231	HED No	Crest RL	Crest Ler	ng id 1.64E+08	3				
DETENTION BASIN D Name Elev OSD B 88.95 89.75 SUB-CATCHMENT D	ETAILS Surf. Area Not Used Outlet 273 Orifice 273	Турі К	Dia(mm)	Centre RL Pit Famil		x	у	HED			ng id	5	Supp Rough	Laq Time or Factor		
DETENTION BASIN D Name Elev OSD B 88.95 88.75 SUB-CATCHMENT DI Name Pit or Node C A01-1 A01-1 C A01-2 A01-2	ETAILS Surf. Area Not Used Outlet 273 Orifice 273 TAILS Total Paved Grass Area Area Area (ha) % % 0.0409 100 0.0202 100	Typi K Supp Area % 0	Dia(mm) 260 Paved Time (min) 0 5 0 5	Centre RL Pit Famil 88.88 Grass Supp Time Time (min) (min) 10	y Pit Type Paved Length (m) 0	x 313475.2 Grass Length	y 6266231 Supp Length	HED No Paved Slope(%)	Crest RL Grass Slope	Crest Ler Supp Slope	ng id 1.64E+08 Paved	3 Grass		Lag Time	Length Slo	
DETENTION BASIN D Name Elev OSD B 88.95 SUB-CATCHMENT DI Name Pit or Node C A01-1 A01-1	ETAILS Surf. Area Not Used Outlet 273 Orffice 273 ETAILS Total Paved Grass Area Area Area (ha) % % 0.0409 100	Typi K Supp Area % 0 0 0 0	Dia(mm) 260 Paved Time (min) D 5	Centre RL Pit Famil 88.88 Grass Supp Time Time (min) (min) 10 10 10	Pit Type Paved Length (m) 0	x 313475.2 Grass Length	y 6266231 Supp Length	HED No Paved Slope(%)	Crest RL Grass Slope	Crest Ler Supp Slope	ng id 1.64E+08 Paved	3 Grass		Lag Time	Length Slo	pe FlowFactor Multiplier
DETENTION BASIN D Name Elev OSD 88.95 SUBE-CATCHMENT DI Name Pit or Node CA01-1 CA01-2 A01-2 CA01-3 A01-3 CA01-4 A01-3 CA01-5 A01-5 CA01-6 A01-6 CA01-7 A01-7	ETAILS Outlet 273 Orifice 273 Orifice 273 Orifice TAILS Read Area Area (ha) % 0.0409 100 0.0202 100 0.023 100 0.021 100 0.021 100 0.0221 100	Турі К Supp Area % 0 0 0 0 0 0 0 0 0 0	Dia(mm) 260 Time (min) 0 5 0 5 0 5 0 5 0 5 0 5 0 5 0 5 0 5 0 5	Centre RL Pit Famil 88.88 Grass Supp Time Time (min) (min) 10 10 10 10 10 10 10	Paved Length (m) 0 0 0 0 0 0	x 313475.2 Grass Length	y 6266231 Supp Length	HED No Paved Slope(%)	Crest RL Grass Slope	Crest Ler Supp Slope	ng id 1.64E+08 Paved	3 Grass		Lag Time	Length Slo	pe FlowFactor Multiplier 1 1 1 1 1 1 1 1 1
DETENTION BASIN D Name Elev OSD 8 88.95 SUB-CATCHMENT DI Name Pitor Pitor Name CA01-1 A01-2 CA01-2 CA01-3 A01-2 CA01-4 Pit243512 CA01-5 A01-5 CA01-6 A01-6 CA01-7 A01-7 CA01-8 A01-8 CA01-9 A01-9	ETAILS Outlet 273 Orifice 273 Orifice 273 Orifice TAILS Area Area Area Area Area 0.0409 100 0.0202 100 0.023 100 0.021 100 0.0221 100 0.0221 100 0.0212 100 0.0219 100	Турч К Supp Area % 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Dia(mm) 260 Time (min) 0 5 0 5 0 5 0 5 0 5 0 5 0 5 0 5 0 5 0 5	Centre RL Pit Famile 88.88 Grass Supp Time Time (min) (min) 10 10 10 10 10 10 10 10 10 10 10 10 10	Paved Length (m) 0 0 0 0 0 0 0 0 0 0 0 0	x 313475.2 Grass Length	y 6266231 Supp Length	HED No Paved Slope(%)	Crest RL Grass Slope	Crest Ler Supp Slope	ng id 1.64E+08 Paved	3 Grass		Lag Time	Length Slo	pe FlowFactoi Multiplier 1 1 1 1 1 1 1
DETENTION BASIN D Name Elev OSD B 88.95 SUB-CATCHMENT DI Name Pit or Node CA01-1 CA01-2 A01-2 CA01-3 A01-3 CA01-4 Pit243512 CA01-5 CA01-6 CA01-6 A01-7 CA01-7 A01-7 CA01-9 A01-9 CA01-11 A01-11	ETAILS Outlet 273 Orifice 273 Orifice ETAILS Grass Total Paved Grass Area Area Area (ha) % % 0.0409 100 0.0202 0.023 100 0.023 0.0171 100 0.0221 0.0221 100 0.0221 0.0212 100 0.0221 0.0219 100 0.0218 0.0276 100 0.0274 0.0218 100 0.0275 0.0219 100 0.0276 0.0218 100 0.0278	Турн К Supp Area % 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Dia(mm) 260 Paved Time (min) 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	Centre RL Pit Famil 88.88 Time Time (min) (min) 10 10 10 10 10 10 10 10 10 10 10 10 10	y Pit Type Paved Length (m) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	x 313475.2 Grass Length	y 6266231 Supp Length	HED No Paved Slope(%)	Crest RL Grass Slope	Crest Ler Supp Slope	ng id 1.64E+08 Paved	3 Grass		Lag Time	Length Slo	pe FlowFactor Multiplier 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
DETENTION BASIN D Name Elev OSD B 88.95 SUB-CATCHMENT DI Name Pit or Node CA01-1 CA01-2 A01-2 CA01-3 A01-3 CA01-4 Pit243512 CA01-5 CA01-6 CA01-6 A01-7 CA01-7 A01-7 CA01-8 A01-9 CA01-10 A01-10 CA01-11 A01-12 CA01-12 A01-13 CA01-13 A01-13	ETAILS Outlet 273 Orifice 273 Orifice ETAILS Total Paved Grass Area Area Area Area (ha) % % 0.0409 100 0.0202 100 0.023 100 0.021 100 0.021 100 0.0221 100 0.0221 100 0.0221 100 0.0221 100 0.02219 100 0.02719 100 0.02719 100 0.02719 100 0.0218 100 0.0282 100 0.0282 100 0.0282 100 0.0282 100 0.0276 100 0.0216 100 0.0218 100 0.0218 100 0.0218 100 0.0218 100 0.0218 100 0.0218 100 0.0218 100 0.0218 100 0.0218 100 0.0218 100 0.0218 100 0.0218 100 0.0214 100 0.0216 <td< td=""><td>Турч К Supp Area % 0 0 0 0 0 0 0 0 0 0 0 0 0</td><td>Dia(mm) 260 Paved Time (min) 0 5 0 5 0 5 0 5 0 5 0 5 0 5 0 5</td><td>Centre RL Pit Famil 88.88 Time Time (min) (min) 10 10 10 10 10 10 10 10 10 10 10 10 10</td><td>Paved Length (m) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td><td>x 313475.2 Grass Length</td><td>y 6266231 Supp Length</td><td>HED No Paved Slope(%)</td><td>Crest RL Grass Slope</td><td>Crest Ler Supp Slope</td><td>ng id 1.64E+08 Paved</td><td>3 Grass</td><td></td><td>Lag Time</td><td>Length Slo</td><td>pe FlowFactor Multiplier 1 1 1 1 1 1 1 1 1 1 1 1 1</td></td<>	Турч К Supp Area % 0 0 0 0 0 0 0 0 0 0 0 0 0	Dia(mm) 260 Paved Time (min) 0 5 0 5 0 5 0 5 0 5 0 5 0 5 0 5	Centre RL Pit Famil 88.88 Time Time (min) (min) 10 10 10 10 10 10 10 10 10 10 10 10 10	Paved Length (m) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	x 313475.2 Grass Length	y 6266231 Supp Length	HED No Paved Slope(%)	Crest RL Grass Slope	Crest Ler Supp Slope	ng id 1.64E+08 Paved	3 Grass		Lag Time	Length Slo	pe FlowFactor Multiplier 1 1 1 1 1 1 1 1 1 1 1 1 1
DETENTION BASIN D Name Elev OSD 8 88.95 SUB-CATCHMENT DI Name Pitor Node C A01-1 A01-3 C A01-2 A01-3 C A01-3 A01-3 C A01-4 Pit243512 C A01-6 A01-6 C A01-7 A01-7 C A01-8 A01-8 C A01-10 A01-9 C A01-10 A01-10 C A01-10 A01-11 C A01-10 A01-13 C A01-10 A01-13 C A01-10 A01-13 C A01-10 A01-14 C A01-10 A01-17 C A01-10 A01-18 C A01-10 A01-17 C A01-10 A01-11 C A01-12 A01-13 C A01-14 A01-14 C A01-17 A01-15 C A01-16 A01-16	ETAILS Outlet 273 Orifice 273 Orifice 273 Orifice 274LIS Grass Area Area Area Area (ha) % 0.022 100 0.023 100 0.021 100 0.021 100 0.021 100 0.021 100 0.0221 100 0.0276 100 0.0276 100 0.0276 100 0.0218 100 0.0221 100 0.0276 100 0.0276 100 0.0218 100 0.0221 100 0.0232 100 0.02323 100	Турі К Supp Area % 0 0 0 0 0 0 0 0 0 0 0 0 0	Dia(mm) 260 Paved Time (min) 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	Centre RL Pit Famile 88.88 Grass Supp Time Time (min) 10 10 10 10 10 10 10 10 10 10 10 10 10 1	y Pit Type Paved Length (m) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	x 313475.2 Grass Length	y 6266231 Supp Length	HED No Paved Slope(%)	Crest RL Grass Slope	Crest Ler Supp Slope	ng id 1.64E+08 Paved	3 Grass		Lag Time	Length Slo	pe FlowFactor Multiplier 1 1 1 1 1 1 1 1 1 1 1 1 1
DETENTION BASIN D Name Elev OSD 8 88.95 SUB-CATCHMENT DI Name Pitor Node C A01-1 A01-3 C A01-1 A01-3 C A01-2 A01-2 C A01-3 A01-5 C A01-4 Pit243512 C A01-6 A01-6 C A01-7 A01-7 C A01-8 A01-9 C A01-10 A01-10 C A01-11 A01-11 C A01-12 A01-13 C A01-14 A01-13 C A01-14 A01-14 C A01-15 CA01-16 C A01-16 A01-16 C A01-16 A01-16 C A01-17 A01-17	ETAILS Outlet 273 Orifice 273 Orifice 273 Orifice 274LIS Grass Area Area Area Area (ha) % 0.022 100 0.022 100 0.021 100 0.0221 100 0.0211 100 0.0221 100 0.0226 100 0.0276 100 0.0276 100 0.0218 100 0.0223 100 0.0218 100 0.0223 100 0.0233 100 0.0233 100 0.0233 100 0.0323 100 0.0156 100	Турі К Supp Area % 0 0 0 0 0 0 0 0 0 0 0 0 0	Dia(mm) 260 Paved Time (min) 50 55 0 55 0 55 0 55 0 55 0 55 0 55 0	Centre RL Pit Famile 88.88 Grass Supp Time Time (min) 10 10 10 10 10 10 10 10 10 10 10 10 10 1	y Pit Type Paved Length (m) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	x 313475.2 Grass Length	y 6266231 Supp Length	HED No Paved Slope(%)	Crest RL Grass Slope	Crest Ler Supp Slope	ng id 1.64E+08 Paved	3 Grass		Lag Time	Length Slo	pe FlowFactor Multiplier 1 1 1 1 1 1 1 1 1 1 1 1 1
DETENTION BASIN D Name Elev OSD 88.95 SUB-CATCHMENT DI Name Pit or Node CA01-1 A01-2 A01-2 CA01-1 A01-1 CA01-2 A01-3 CA01-3 A01-3 CA01-4 A01-4 CA01-5 A01-6 CA01-6 A01-7 CA01-7 A01-10 CA01-10 A01-10 CA01-11 A01-10 CA01-12 A01-12 CA01-13 A01-13 CA01-14 A01-14 CA01-15 A01-15 CA01-15 A01-14	ETAILS Outlet 273 Orifice 273 Orifice ETAILS Total Paved Grass Area Area Area Area (ha) % % 0.0409 100 0.0202 100 0.023 100 0.021 100 0.0221 100 0.0221 100 0.0221 100 0.0221 100 0.0221 100 0.0221 100 0.0226 100 0.0276 100 0.0276 100 0.0276 100 0.0228 100 0.0228 100 0.0228 100 0.0228 100 0.0228 100 0.0228 100 0.0228 100 0.0228 100 0.0232 100 0.0232 100 0.0232 100 0.0232 100 0.0232 100 0.0232 100 0.0232 100 0.0232 100 0.0232 100 0.0232 100 0.0232 100 0.0232 100	Турі К Supp Area % 0 0 0 0 0 0 0 0 0 0 0 0 0	Dia(mm) 260 Paved Time (min) 0 5 0 5 0 5 0 5 0 5 0 5 0 5 0 5 0 5 0 5	Centre RL Pit Famile 88.88 Grass Supp Time Time (min) 10 10 10 10 10 10 10 10 10 10 10 10 10	y Pit Type Paved Length (m) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	x 313475.2 Grass Length	y 6266231 Supp Length	HED No Paved Slope(%)	Crest RL Grass Slope	Crest Ler Supp Slope	ng id 1.64E+08 Paved	3 Grass		Lag Time	Length Slo	pe FlowFactor Multiplier 1 1 1 1 1 1 1 1 1 1 1 1 1
DETENTION BASIN D Name Elev OSD 88.95 SUB-CATCHMENT DI Name Pit or Name Pit or CA01-1 A01-2 CA01-2 A01-3 CA01-3 A01-3 CA01-4 Pit245512 CA01-5 A01-6 CA01-6 A01-7 CA01-7 A01-7 CA01-8 A01-9 CA01-10 A01-10 CA01-10 A01-11 CA01-12 A01-12 CA01-14 A01-13 CA01-15 A01-13 CA01-14 A01-14 CA01-15 A01-15 CA01-16 A01-16 CA01-17 A01-17 CA01-18 A01-18 CA01-19 A01-20 CA02-14 A02-4	ETAILS Outlet 273 Outlet 273 Orifice Total Paved Grass Area Area Area (ha) % % 0.0409 100 0.0202 0.023 100 0.023 0.021 100 0.0221 0.0221 100 0.0221 0.0216 100 0.0221 0.0276 100 0.0233 0.0218 100 0.0233 0.043 100 0.0233 0.043 100 0.0233 0.0233 100 0.0233 0.043 100 0.0233 0.043 100 0.0233 0.043 100 0.0233 0.0165 100 0.0165 0.0178 100 0.0233 0.0165 100 0.0165 0.0165 100 0.0165 0.0165 100 0.0165 <td< td=""><td>Тури К Supp Area % 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td><td>Dia(mm) 260 Time (min) 50 55 55</td><td>Centre RL Pit Famile 88.88 Time Time (min) (min) 10 10 10 10 10 10 10 10 10 10 10 10 10</td><td>y Pit Type Paved Length (m) 0<!--</td--><td>x 313475.2 Grass Length</td><td>y 6266231 Supp Length</td><td>HED No Paved Slope(%)</td><td>Crest RL Grass Slope</td><td>Crest Ler Supp Slope</td><td>ng id 1.64E+08 Paved</td><td>3 Grass</td><td></td><td>Lag Time</td><td>Length Slo</td><td>pe FlowFactor Multiplier 1 1 1 1 1 1 1 1 1 1 1 1 1</td></td></td<>	Тури К Supp Area % 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Dia(mm) 260 Time (min) 50 55 55	Centre RL Pit Famile 88.88 Time Time (min) (min) 10 10 10 10 10 10 10 10 10 10 10 10 10	y Pit Type Paved Length (m) 0 </td <td>x 313475.2 Grass Length</td> <td>y 6266231 Supp Length</td> <td>HED No Paved Slope(%)</td> <td>Crest RL Grass Slope</td> <td>Crest Ler Supp Slope</td> <td>ng id 1.64E+08 Paved</td> <td>3 Grass</td> <td></td> <td>Lag Time</td> <td>Length Slo</td> <td>pe FlowFactor Multiplier 1 1 1 1 1 1 1 1 1 1 1 1 1</td>	x 313475.2 Grass Length	y 6266231 Supp Length	HED No Paved Slope(%)	Crest RL Grass Slope	Crest Ler Supp Slope	ng id 1.64E+08 Paved	3 Grass		Lag Time	Length Slo	pe FlowFactor Multiplier 1 1 1 1 1 1 1 1 1 1 1 1 1
DETENTION BASIN D Name Elev OSD 88.95 SUB-CATCHMENT DI Name Pit or Name Pit or CA01-1 A01-2 CA01-2 A01-2 CA01-3 A01-3 CA01-4 Pit245512 CA01-5 CA01-6 CA01-6 A01-6 CA01-7 A01-7 CA01-8 A01-9 CA01-10 A01-10 CA01-10 A01-11 CA01-12 A01-13 CA01-14 A01-14 CA01-15 A01-13 CA01-16 A01-17 CA01-18 A01-18 CA01-18 A01-18 CA01-18 A01-19 CA01-20 A01-20 C A01-21 A01-20 C A01-21 A01-20 C A02-3 A02-3 C A02-4 A02-4 C A02-5 A02-5	ETAILS Outlet 273 Outlet 70al Paved Grass Area Area Area (ha) % % 0.0228 100 0.0221 0.0212 100 0.0212 0.0212 100 0.0212 0.0212 100 0.0221 0.0213 100 0.0221 0.0214 100 0.0221 0.0215 100 0.0231 0.0228 100 0.02323 0.0221 100 0.02323 0.0231 100 0.0156 0.0156 100 0.0165 0.0165 100 0.0208 0.0165 100 0.0208 <td>Турі К Supp Area % 0 0 0 0 0 0 0 0 0 0 0 0 0</td> <td>Dia(mm) 260 Paved Time 0 5 0 5 0 5 0 5 0 5 0 5 0 5 0 5</td> <td>Centre RL Pit Famile 88.88 Grass Supp Time Time (min) (min) 10 10 10 10 10 10 10 10 10 10 10 10 10</td> <td>y Pit Type Paved Length (m) 0 0 0 0 0 0 0 0 0 0 0 0 0</td> <td>x 313475.2 Grass Length</td> <td>y 6266231 Supp Length</td> <td>HED No Paved Slope(%)</td> <td>Crest RL Grass Slope</td> <td>Crest Ler Supp Slope</td> <td>ng id 1.64E+08 Paved</td> <td>3 Grass</td> <td></td> <td>Lag Time</td> <td>Length Slo</td> <td>pe FlowFactor Multiplier 1 1 1 1 1 1 1 1 1 1 1 1 1</td>	Турі К Supp Area % 0 0 0 0 0 0 0 0 0 0 0 0 0	Dia(mm) 260 Paved Time 0 5 0 5 0 5 0 5 0 5 0 5 0 5 0 5	Centre RL Pit Famile 88.88 Grass Supp Time Time (min) (min) 10 10 10 10 10 10 10 10 10 10 10 10 10	y Pit Type Paved Length (m) 0 0 0 0 0 0 0 0 0 0 0 0 0	x 313475.2 Grass Length	y 6266231 Supp Length	HED No Paved Slope(%)	Crest RL Grass Slope	Crest Ler Supp Slope	ng id 1.64E+08 Paved	3 Grass		Lag Time	Length Slo	pe FlowFactor Multiplier 1 1 1 1 1 1 1 1 1 1 1 1 1
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DETENTION BASIN D Name Elev OSD B 88.95 SUB-CATCHMENT DI Name Pitor Node C A01-1 A01-1 C A01-2 C A01-2 C A01-3 A01-3 C A01-4 Pit243512 C A01-6 A01-8 C A01-7 C A01-7 C A01-8 A01-8 C A01-10 A01-10 C A01-10 A01-11 C A01-10 A01-13 C A01-10 A01-13 C A01-10 A01-13 C A01-10 A01-13 C A01-10 A01-11 C A01-10 A01-13 C A01-10 A01-13 C A01-12 A01-13 C A01-14 A01-14 C A01-15 C A01-16 C A01-16 A01-17 C A01-21 A01-21 C A01-21 A01-21 C A02-21 A02-31 C A02-24 A02-32 C A02-3 A02-32	ETAILS Outlet 273 Outlet 273 Orifice 273 Orifice 273 Orifice 273 Orifice 70lal Paved Grass Area Area Area (ha) % 0 0 0.020 100 0 0.023 100 0.021 100 0.0221 100 0 0.0221 100 0.021 0.0 0.021 0.0 0.021 100 0.0221 100 0.0221 0.0 0.021 0.0 0.021 100 0.0221 100 0.0221 100 0.021 0.0 0.021 100 0.0223 100 0.0223 100 0.0223 100 0.0223 100 0.0223 100 0.0223 100 0.0223 100 0.0224 100 0.0165 100 0.0216 100 0.0165 100 0.0216 100 0.0165 100 0.0226 <td>Typi K Supp Area % 0 0 0 0 0 0 0 0 0 0 0 0 0</td> <td>Dia(mm) 260 Paved Time (min) 5 5 5 5 5 5 5 5 5 5 5 5 5</td> <td>Centre RI Pit Famile 88.88 Grass Supp Time Time (min) (min) 10 10 10 10 10 10 10 10 10 10 10 10 10</td> <td>y Pit Type Paved Length (m) 0 0 0 0 0 0 0 0 0 0 0 0 0</td> <td>x 313475.2 Grass Length</td> <td>y 6266231 Supp Length</td> <td>HED No Paved Slope(%)</td> <td>Crest RL Grass Slope</td> <td>Crest Ler Supp Slope</td> <td>ng id 1.64E+08 Paved</td> <td>3 Grass</td> <td></td> <td>Lag Time or Factor</td> <td>Length Sic</td> <td>pe FlowFactor Multiplier</td>	Typi K Supp Area % 0 0 0 0 0 0 0 0 0 0 0 0 0	Dia(mm) 260 Paved Time (min) 5 5 5 5 5 5 5 5 5 5 5 5 5	Centre RI Pit Famile 88.88 Grass Supp Time Time (min) (min) 10 10 10 10 10 10 10 10 10 10 10 10 10	y Pit Type Paved Length (m) 0 0 0 0 0 0 0 0 0 0 0 0 0	x 313475.2 Grass Length	y 6266231 Supp Length	HED No Paved Slope(%)	Crest RL Grass Slope	Crest Ler Supp Slope	ng id 1.64E+08 Paved	3 Grass		Lag Time or Factor	Length Sic	pe FlowFactor Multiplier
DETENTION BASIN D Name Elev OSD B 88.95 SUB-CATCHMENT DI Name Pito Pito Name Pito CA01-1 A01-2 CA01-2 A01-2 CA01-3 A01-3 CA01-4 A01-4 CA01-5 A01-5 CA01-6 A01-6 CA01-7 A01-7 CA01-8 A01-8 CA01-1 A01-10 CA01-1 A01-11 CA01-1 A01-11 CA01-1 A01-11 CA01-12 A01-13 CA01-14 A01-11 CA01-15 A01-16 CA01-16 A01-17 CA01-17 CA01-16 CA01-18 A01-17 CA02-1 A02-31 CA02-2 A02-32 CA02-3 A02-31 CA02-4 A02-41 CA02-5 CA02-6 CA02-6 A02-61 CA02-7 CA02-7 <td>ETAILS Surf. Area Not Used Outlet 273 Orifice 273 Orifice 774L Paved Grass Area Area Area Area Area 0.022 100 0.0221 100 0.0221 100 0.0221 100 0.0221 100 0.0221 100 0.0221 100 0.0221 100 0.0223 100 0.0223 100 0.0223 100 0.0223 100 0.0223 100 0.0223 100 0.0223 100 0.0233 100 0.0233 100 0.0155 100 0.0223 100 0.0165 100 0.0165 100 0.0165 100 0.0165 100 0.0164 100 0.0468 100 0.0164<</td> <td>Typr K Supp Area % 0 0 0 0 0 0 0 0 0 0 0 0 0</td> <td>Dia(mm) 260 Paved Time (min) 5 5 5 5 5 5 5 5 5 5 5 5 5 5</td> <td>Centre RI Pit Famile 88.88 Grass Supp Time Time (min) 10 10 10 10 10 10 10 10 10 10 10 10 10 1</td> <td>Paved Length (m) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td> <td>x 313475.2 Grass Length</td> <td>y 6266231 Supp Length</td> <td>HED No Paved Slope(%)</td> <td>Crest RL Grass Slope</td> <td>Crest Ler Supp Slope</td> <td>ng id 1.64E+08 Paved</td> <td>3 Grass</td> <td></td> <td>Lag Time or Factor</td> <td>Length Sic</td> <td>pe FlowFactor Multiplier</td>	ETAILS Surf. Area Not Used Outlet 273 Orifice 273 Orifice 774L Paved Grass Area Area Area Area Area 0.022 100 0.0221 100 0.0221 100 0.0221 100 0.0221 100 0.0221 100 0.0221 100 0.0221 100 0.0223 100 0.0223 100 0.0223 100 0.0223 100 0.0223 100 0.0223 100 0.0223 100 0.0233 100 0.0233 100 0.0155 100 0.0223 100 0.0165 100 0.0165 100 0.0165 100 0.0165 100 0.0164 100 0.0468 100 0.0164<	Typr K Supp Area % 0 0 0 0 0 0 0 0 0 0 0 0 0	Dia(mm) 260 Paved Time (min) 5 5 5 5 5 5 5 5 5 5 5 5 5 5	Centre RI Pit Famile 88.88 Grass Supp Time Time (min) 10 10 10 10 10 10 10 10 10 10 10 10 10 1	Paved Length (m) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	x 313475.2 Grass Length	y 6266231 Supp Length	HED No Paved Slope(%)	Crest RL Grass Slope	Crest Ler Supp Slope	ng id 1.64E+08 Paved	3 Grass		Lag Time or Factor	Length Sic	pe FlowFactor Multiplier
DETENTION BASIN D Name Elev OSD B 88.95 SUB-CATCHMENT DI Name Pitor Node CA01-1 A01-1 CA01-2 CA01-3 CA01-3 A01-3 CA01-4 Pit243512 CA01-5 CA01-6 CA01-6 A01-8 CA01-7 CA01-8 CA01-10 A01-10 CA01-10 A01-11 CA01-10 A01-12 CA01-10 A01-13 CA01-10 A01-13 CA01-10 A01-13 CA01-10 A01-11 CA01-12 A01-13 CA01-14 A01-14 CA01-15 A01-16 CA01-16 A01-17 CA01-17 A01-18 CA01-18 A01-19 CA02-1 A02-3 CA02-2 A02-4 CA02-3 A02-3 CA02-4 A02-4 CA02-5 A02-2 CA02-6	ETAILS Surf. Area Not Used Outlet 273 Orifice 273 Orifice 273 Orifice 273 Orifice 273 Orifice 70al Paved Grass Area Area Area (ha) % % 0 0.020 100 0.021 00 0.021 100 0.0221 00 0.021 100 0.0221 00 0.021 100 0.0221 00 0.0221 100 0.0216 100 0.0226 100 0.0223 100 0.0276 100 0.0223 100 0.0284 100 0.0233 100 0.0218 100 0.0165 100 0.0165 100 0.0216 100 0.0165 100 0.0286 100 0.0162 100 0.0441 100 0.01084<	Typr K Supp Area % 0 0 0 0 0 0 0 0 0 0 0 0 0	Dia(mm) 260 Paved Time (min) 5 0 5 0 5 0 5 0 5 0 5 0 5 0 5 0	Centre RL Pit Famil 88.88 Grass Supp Time (min) 10 10 10 10 10 10 10 10 10 10	y Pit Type Paved Length (m) 0 0 0 0 0 0 0 0 0 0 0 0 0	x 313475.2 Grass Length	y 6266231 Supp Length	HED No Paved Slope(%)	Crest RL Grass Slope	Crest Ler Supp Slope	ng id 1.64E+08 Paved	3 Grass		Lag Time or Factor	Length Sic	pe FlowFactor Multiplier

Name	From	То	Length	U/S IL	D/S IL	Slope	Туре	Dia	I.D.	Rough	Pipe Is	No. Pipes	Chg From	At Chg	Chg	RI	Chg	RL	etc
P A01-1	A01-1	A01-2	(m) 8.499	(m) 95.86			Concrete,		(mm) 375		3 Existing		1 A01-2		(m) 0	(m)	(m)	(m)	(m)
P A01-2 P A01-3 P249763	A01-2 A01-3 Pit243512	A01-3 Pit243512	23.387 10.947 6	95.73 94.97 94.66	94.667	2.7	Concrete, Concrete, Concrete.	375	375 375 375	0.	3 Existing 3 Existing 3 Existing		1 A01-3 1 Pit243512 1 A01-4		0 0 0				
P A01-4 P A01-5	A01-4 A01-5	A01-4 A01-5 A01-6	12.197 14.184	94.00 94.5 94.06	94.06	3.6	Concrete, Concrete, Concrete.	375	375 375	0.	3 Existing 3 Existing 3 Existing		1 A01-4 1 A01-5 1 A01-6		0				
P A01-6 P A01-7	A01-6 A01-7	A01-7 A01-8	20.769	93.32 92.33	92.33	4.7	Concrete, Concrete,	375	375	0.	3 Existing 3 Existing		1 A01-7 1 A01-8		0				
P A01-8 P A01-9	A01-8 A01-9	A01-0 A01-9 A01-10	21.169	90.48 89.15	89.15	6.28	6 Concrete, 6 Concrete,	375	375 375	0.	3 Existing 3 Existing		1 A01-9 1 A01-10		0				
P A01-10	A01-10 A01-11	A01-11 A01-12	6.791 19.249	88.3 88.14	88.14	2.36	Concrete, Concrete,	600	600 600	0.	3 Existing 3 Existing		1 A01-11 1 A01-12		0 0				
P A01-12 P A01-13	A01-12	A01-13 A01-14	10.699 18.075	87.77 87.48	87.48	2.7	Concrete, Concrete,	600	600 600	0.	3 Existing 3 Existing		1 A01-13 1 A01-14		0				
P A01-14 P A01-15		A01-15 A01-16	11.834 11.938	87.31 87.13	87.13	1.52	2 Concrete, 2 Concrete,	750	750 750	0.	3 Existing 3 Existing		1 A01-15 1 A01-16		0				
P A01-16 P A01-17		A01-17 A01-18	5.116 4.46	87.02 86.94			Concrete, Concrete,		750 750		3 Existing 3 Existing		1 A01-17 1 A01-18		0 0				
P A01-18 P A01-19		A01-19 A01-20	22.421 12.319	86.87 86.69		1.54	Concrete, Concrete,	750	750 750		3 Existing 3 Existing		1 A01-19 1 A01-20		0 0				
	A01-20 A01-21	A01-21 A01-22	8.889 11.825	86.5 86.39	86		Concrete, Concrete,	750	750 750		3 Existing 3 Existing		1 A01-21 1 A01-22		0 0				
P A02-1 P A02-2	A02-1 A02-2	A02-2 A02-3	11.477 11.129	96.464 95.95	95.73	1.98	3 Concrete, 3 Concrete,	375	375	0.	3 Existing 3 Existing		1 A02-2 1 A02-3		0 0				
P A02-3 P A02-4	A02-3 A02-4	A02-4 A02-5	39.237 14.996	95.73 93.57	92.57	6.6	Concrete, Concrete,	375	375 375	0.	3 Existing 3 Existing		1 A02-4 1 A02-5		0				
P A02-5 P A02-6	A02-5 A02-6	A02-6 A02-7	33.903 25.327	92.57 90.28		7.9	5 Concrete, 9 Concrete,	375	375 375	0.	3 Existing 3 Existing		1 A02-6 1 A02-7		0				
P A02-7 P A02-8	A02-7 A02-8	A02-8 A01-21	9.827 32.144	88.28 87.73	86.39	4.1	Concrete, Concrete,	600	600 600	0.	3 Existing 3 Existing		1 A02-8 1 A01-21		0				
P A03-1 P A03-2	A03-1 A03-2	A03-2 A03-3	6.812 10.299	94.148 94.06	93.957		Concrete, Concrete,	375	375 375	0.	3 Existing 3 Existing		1 A03-2 1 A03-3		0				
P A03-3 P A03-4 P A03-5	A03-3 A03-4 A03-5	A03-4 A03-5 A01-6	8.534 18.662 8.09	93.937 93.832 93.44		2.1	Concrete,	375	375 375 375	0.	3 Existing 3 Existing 3 Existing		1 A03-4 1 A03-5 1 A01-6		0 0 0				
P A03-5 P A04-1 P A04-2	A03-5 A04-1 A04-2	A01-6 A04-2 A04-3	10.43 7.333	93.44 88.74 88.41		3.16	3 Concrete, 3 Concrete, 3 Concrete,	375	375 375	0.	3 Existing 3 Existing		1 A01-6 1 A04-2 1 A04-3		0				
P A04-2 P A04-3 P A04-4	A04-2 A04-3 A04-4	A04-3 A04-4 A04-5	8.133 18.602	88.1 87.85	87.85	3.07	Concrete, Concrete, Concrete.	375	375 375 375	0.	3 Existing 3 Existing		1 A04-5 1 A04-4 1 A04-5		0				
P A04-4 P A04-5 P A07-1	A04-4 A04-5 A07-1	A01-13 A01-8	12.954 8.018	87.616 90.63	87.48	1.0	5 Concrete, 5 Concrete, 7 Concrete,	375	375 375	0.	3 Existing 3 Existing		1 A01-13 1 A01-8		0				
P A08-1 P A10-1	A08-1 A10-1	A01-8 A01-7 A10-2	7.982	92.57 93.33	92.33	3.0	Concrete, Concrete,	375	375 375	0.	3 Existing 3 Existing		1 A01-5 1 A01-7 1 A10-2		0				
P A10-2 P A11-1	A10-2 A011-1	A02-5 A01-3	9.432 8.231	93.09 95.052	92.57	5.5	Concrete, Concrete,	375	375 375	0.	3 Existing 3 Existing		1 A02-5 1 A01-3		0				
P A12-1	A012-1 Pit649042	A01-4	8.246 51.6	94.582 90.6	94.5	0.99	OCONCRETE, UPVC, not	375	375 105	0.	3 Existing 3 NewFixed		1 A01-4 1 OSD B		0				
	Pit649042		10 3	90.7 88.95	90.28	4.2	2 uPVC, uno Concrete,	375		0.0	3 NewFixed 3 NewFixed		1 A09-1 1 A05-1		0				
P A05-1		A01-10	10.768 37.8	88.64 90.9	88.3 89.15	3.16 4.63	6 Concrete, 8 uPVC, not	375	375 105	0.0	3 Existing 3 NewFixed	1	1 A01-10 1 OSD B		0 0				
Pipe67168		Pit649049	10 10	91 89.09	89.04	0.9	UPVC, und 5 uPVC, not	225	386 242	0.0	3 NewFixed 3 New	:	1 A06-1 2 Pit649049		0 0				
Pipe67168	Pit649048		9 9	89.04 88.995	88.95	0.5	5 uPVC, not 5 uPVC, not	225	242 242	0.0	3 New 3 NewFixed	1 2	2 Pit649048 2 OSD B		0 0				
P A09-1 P A09-2	A09-1 A09-2	A09-2 A09-3	9.062 14.298	90.28 90.01	88.89	7.83	3 Concrete, 3 Concrete,	375	375 375	0.	3 Existing 3 Existing		1 A09-2 1 A09-3		0				
P A09-3 P A06-1	A09-3 A06-1	A02-7 A01-8	9.644 10.657	88.89 90.9			Concrete, Concrete,		375 375		3 Existing 3 Existing		1 A02-7 1 A01-8		0 0				
DETAILS (Pipe	of SERVICE Chg	ES CROSSIN Bottom	NG PIPES Height of S	Cha	Bottom	Height of	S Cha	Bottom	Height of S	etc									
	(m)	Elev (m)	 (m)		Elev (m)		(m)	Elev (m)	(m)										
CHANNEL Name				(m) Length	U/S IL	(m) D/S IL	(m) Slope	Base Widt	(m) L.B. Slope	etc R.B. Slop		Depth	Roofed						
Name	DETAILS	То	(m)	(m)		(m)	(m)	Base Widt (m)	(m) I L.B. Slope (1:?)	etc R.B. Slop (1:?)	e Manning n	Depth (m)	Roofed						
Name	DETAILS From	To DETAILS To	(m) Type Travel	(m) Length	U/S IL	(m) D/S IL	(m) Slope	Base Widt (m) Safe Dept	(m) L.B. Slope	etc R.B. Slop (1:?) Safe DxV	n Bed Slope			id					
Name OVERFLC Name F A01-1x	DETAILS From W ROUTE From A01-1	To DETAILS To A011-1	(m) Type Travel Time (min) 1	(m) Length (m) Spill	U/S IL (m) Crest	(m) D/S IL (m) Weir	(m) Slope (%) Cross Section 7.5 m road	Base Widt (m) Safe Depti Major Stor (m) d. 0.3	(m) L.B. Slope (1:?) SafeDepth Minor Stor (m) 0.15	etc R.B. Slop (1:?) Safe DxV (sq.m/se 0.	n Bed Slope (%) 4 3.21	(m) D/S Area Contributi %	ng D	4634414			22.95		
Name OVERFLC Name F A01-1x F A01-2x F A01-3x	A01-1 A01-2 A01-3	To DETAILS To A011-1 A01-3 Pit243512	(m) Type Travel Time (min) 1 1 1	(m) Length (m) Spill Level	U/S IL (m) Crest Length	(m) D/S IL (m) Weir	(m) Slope (%) Cross Section 7.5 m road 7.5 m road 7.5 m road	Base Widt (m) Safe Depti Major Stor (m) d 0.3 d 0.3 d 0.3	(m) L.B. Slope (1:?) SafeDepth Minor Stor (m) 0.15 0.15 0.15	etc R.B. Slop (1:?) Safe DxV (sq.m/se 0. 0. 0.	n Bed Slope c) (%) 4 3.21 4 3.03 4 3.26	(m) D/S Area Contributi % 1 100 3 100 5 100	ng D D D	4634414 4634414 4634414	8 9		23.38 16.94	7 7	
Name OVERFLC Name F A01-1x F A01-2x F A01-2x F A01-3x OF236497 F A01-4x	A01-1 A01-2 A01-3 Pit243512 A01-4	To DETAILS To A011-1 A01-3 Pit243512 A01-4 A01-5	(m) Type Travel Time (min) 1	(m) Length (m) Spill Level	U/S IL (m) Crest Length	(m) D/S IL (m) Weir	(m) Slope (%) Cross Section 7.5 m road 7.5 m road 7.5 m road 7.5 m road 7.5 m road 7.5 m road	Base Widt (m) Safe Dept Major Stor (m) d 0.3 d 0.3 d 0.3 d 0.3 d 0.3 d 0.3	(m) I.L.B. Slope (1:?) SafeDepth Minor Stor (m) 0.15 0.15 0.15 0.15 0.15	etc R.B. Slop (1:?) Safe DxV (sq.m/se 0. 0. 0. 0. 0. 0. 0. 0. 0.	n Bed Slope c) (%) 4 3.21 4 3.03 4 3.26 4 3.26 4 3.15	(m) D/S Area Contributi % 1 10/ 3 10/ 5 10/ 5 10/ 5 10/ 5 10/	ng D D D D D D	4634414 4634414 4634414 9368736 4634415	8 9 4 0		23.38 16.94 16.94 12.54	7 7 9	
Name OVERFLC Name F A01-1x F A01-2x F A01-2x OF236497 F A01-4x F A01-4x F A01-5x F A01-5x	A01-1 A01-2 A01-3 Pit243512 A01-4 A01-5 A01-6	To DETAILS To A011-1 A01-3 Pit243512 A01-4 A01-5 A01-6 A01-7	(m) Type Travel Time (min) 1 1 1 1	(m) Length (m) Spill Level	U/S IL (m) Crest Length	(m) D/S IL (m) Weir	(m) Slope (%) Cross Section 7.5 m road 7.5 m road 7.5 m road 7.5 m road 7.5 m road 7.5 m road 7.5 m road	Base Widt (m) Safe Depti Major Stor (m) d 0.3 d 0.3 d 0.3 d 0.3 d 0.3 d 0.3 d 0.3 d 0.3 d 0.3	(m) L.B. Slope (1:?) SafeDepth Minor Ston (m) 0.15 0.15 0.15 0.15 0.15 0.15 0.15	etc R.B. Slop (1:?) Safe DxV (sq.m/se 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.	n Bed Slope 5) (%) 4 3.21 4 3.02 4 3.26 4 3.26 4 3.96 4 4.26	(m) D/S Area Contributi % 1 10/ 3 10/ 5 10/	nq D D D D D D D D D D	4634414 4634414 4634414 9368736 4634415 4634415 4634415	8 9 4 0 1 2		23.38 16.94 16.94 12.54 15.21 20.76	7 7 7 9 2 8	
Name OVERFLC Name F A01-1x F A01-2x F A01-2x F A01-2x F A01-3x F A01-4x F A01-5x F A01-5 F A01-7 F A01-7 F A01-8	DETAILS From W ROUTE From A01-1 A01-2 A01-3 Pit243512 A01-4 A01-5 A01-5 A01-6 A01-7 A01-8	To DETAILS To A011-1 A01-3 Pit243512 A01-4 A01-5 A01-6 A01-6 A01-7 A01-8 A01-9	(m) Type Travel Time (min) 1 1 1 1	(m) Length (m) Spill Level	U/S IL (m) Crest Length	(m) D/S IL (m) Weir	(m) Slope (%) Cross Section 7.5 m road 7.5 m roa	Base Widt (m) Safe Depti Major Stor (m) 1 0.3 1 0.3	(m) L.B. Slope (1:?) SafeDepth Minor Stor (m) 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15	etc R.B. Slop (1:?) Safe DxV (sq.m/se 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.	n Bed Slope (%) 4 3.21 4 3.22 4 3.26 4 3.26 4 3.26 4 3.26 4 3.26 4 3.26 4 3.6 4 3.6 4 3.6 4 3.6 4 3.6 4 3.6 4 3.6 4 3.6 4 3.6 5 (%) 4 3.6 5 (%) 4 3.6 6 (%) 4 3.6 6 (%) 4 3.6 7 (%) 5	(m) D/S Area Contributi % 1 10/ 3 10/ 5 10/	nq 0 0 0 0 0 0 0 0 0 0 0	4634414 4634414 9368736 4634415 4634415 4634415 4634415 4634415	8 9 4 0 1 2 3 4		23.38 16.94 16.94 12.54 15.21 20.76 32.29 21.16	7 7 9 2 8 8 9	
Name OVERFLC Name F A01-1x F A01-2x F A01-2x F A01-3x OF236497 F A01-3x F A01-4x F A01-6 F A01-7 F A01-6 F A01-7 F A01-9 F A01-10	DETAILS From W ROUTE From A01-1 A01-2 A01-3 Prit243512 A01-4 A01-6 A01-6 A01-7 A01-8 A01-8 A01-10	To DETAILS To A011-1 A01-3 Pit243512 A01-4 A01-5 A01-6 A01-7 A01-8 A01-9 A01-19 A01-11	(m) Type Travel Time (min) 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	(m) Length (m) Spill Level	U/S IL (m) Crest Length	(m) D/S IL (m) Weir	(m) Slope (%) Cross Section 7.5 m road 7.5 m road	Base Widt (m) Safe Depti Major Stor (m) d 0.3 d	(m) I L.B. Slope (1:?) SafeDepth Minor Stor (m) 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15	etc R.B. Slop (1:?) Safe DxV (sq.m/se 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.	n Bed Slope 2) (%) 4 3.21 4 3.26 4 3.26 4 3.26 4 3.96 4 4.26 4 5.77 4 6.67 4 5.16 4 5.17 4 5.11 4 5.12	(m) D/S Area Contributi % 1 10/3 3 10/0 5 10/0	ng 0 0 0 0 0 0 0 0 0 0 0 0 0 0	4634414 4634414 9368736 4634415 4634415 4634415 4634415 4634415 4634415 4634415	8 9 4 0 1 2 3 4 5 6		23.38 16.94 16.94 12.54 15.21 20.76 32.29 21.16 17.90 6.7	7 7 9 2 8 8 9 1 9	
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Name OVERFLC Name F A01-1x F A01-2x F A01-1x F A01-2x F A01-3x F A01-3x F A01-6x F A01-7x F A	DETAILS From A01-1 A01-2 A01-3 A01-3 A01-3 A01-3 A01-3 A01-3 A01-4 A01-3 A01-4 A01-3 A01-4 A01-7 A01-8 A01-1 A01-10 A01-11 A01-13 A01-11 A01-11 A01-11 A01-11 A01-12 A01-14 A01-14 A01-14 A01-14 A01-14 A01-14 A01-14 A01-12 A01-14 A01-12 A01-14 A01-12 A01-14 A01-12 A01-14 A01-12 A01-14 A01-12 A01-14 A01-12 A01-14 A01-12 A02-1 A02-1 A03-2 A03-3 A03-4 A03-4 A03-1 A01-1	To DETAILS To A011-1 A01-3 PIE243512 A01-4 A01-6 A01-7 A01-8 A01-9 A01-10 A01-10 A01-10 A01-11 A01-12 A01-14 A01-14 A01-14 A01-14 A01-14 A01-17 A01-17 A01-17 A01-17 A01-12 A01-12 A01-2 A02-3 A02-4 A02-5 A02-6 A02-7 A02-8 A03-5 A03-7 A	(m) Type Travel Time (min) 1 1 1 1 1 1 1 1 1 1 1 1 1	(m) Length (m) Spill Level	U/S IL (m) Crest Length	(m) D/S IL (m) Weir Coeff. C	(m) Slope (%) Cross Section 7.5 m road 7.5 m road	Base Widt (m) Safe Dept Major Stor (m) 3 0.3 3 0	(m) IL.B. Slope (1:?) SafeDepth Minor Stor (m) 0.15 0	etc R.B. Slop(11:7) Safe DxV (1:7) Safe DxV (sq.m/sec 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	n Bed Slope	(m) D/S Area Contribut % 1 003 1 100 5 1000 5 1000 5 1000 5 1000 5 1000 5 1	ng 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	4634414 4634414 4634414 4634415 4634415 4634415 4634415 4634415 4634415 4634415 4634415 4634416 4634416 4634416 4634417 463447 46347 4634	89401234567890012345567890012345697890122347823255638881		23.88 16.94 12.54 12.54 12.57 20.76 32.29 21.16 17.90 6.7 21.49 21.73 18.07 11.83 5.11 4.4 22.77 13.27 13.3 1.19 39.32 33.90 33.90 33.90 33.90 33.90 33.90 33.90 32.9 82 20.43 10.29 12.53 20.43 32.20 32.20 32.20 32.20 32.20 32.20 32.20 32.20 32.20 32.20 32.20 32.20 32.20 33.20	7 7 7 9 2 8 8 9 1 9 4 9 6 4 8 5 6 5 1 6 0 5 8 2 6 3 7 1 0 1 1 9 6 5 9 3 2 8 4 4 4 1 2 5 9 8 0 9 5 7	
Name OVERFLC Name F A01-1x F A01-2x F A01-1x F A01-2x F A01-3x F A01-6x F A01-7x F A01-1x F A	DETAILS From A01-1 A01-2 A01-3 A01-3 A01-3 A01-3 A01-3 A01-3 A01-4 A01-3 A01-4 A01-7 A01-4 A01-7 A01-4 A01-7 A01-1 A01-2 A02-1 A02-1 A03-2 A03-3 A03-4 A03-5 A03-1 A04-1 A01-1 A01-1 A01-1 A03-5 A03-4 A03-5 A03-4 A03-1 A01-1 A01-1 A01-1 A01-1 A03-5 A03-4 A03-5 A03-4 A03-5 A03-4 A03-1 A01-1 A01-1 A01-1 A01-1 A01-1 A02-2 A03-3 A03-4 A03-5 A03-4 A03-1 A01-1 A01-1 A01-1 A01-1 A01-1 A02-2 A03-3 A03-4 A03-5 A03-4 A03-5 A03-1 A01-1 A01-1 A01-1 A01-1 A01-1 A01-1 A01-1 A01-1 A01-1 A03-5 A03-4 A03-5 A03-4 A01-1	To DETAILS To A011-1 A01-3 PIE243512 A01-4 A01-5 A01-6 A01-7 A01-8 A01-9 A01-10 A01-11 A01-12 A01-14 A01-14 A01-14 A01-14 A01-14 A01-14 A01-17 A01-17 A01-17 A01-17 A01-12 A01-2 A02-3 A02-4 A02-5 A02-6 A02-7 A02-8 A02-7 A02-8 A03-5 A03-1 A0-	(m) Type Travel Time (min) 1 1 1 1 1 1 1 1 1 1 1 1 1	(m) Length (m) Spill Level (m)	U/S IL (m) Crest Length (m)	(m) D/S IL (m) Weir Coeff. C	(m) Slope (%) Cross Section 7.5 m road 7.5 m road	Base Widt (m) Safe Dept Major Stor (m) 3 0.3 3 0	(m) IL.B. Slope (1:?) SafeDepth Minor Stor (m) 0.15 0	etc R.B. Slop(11:7) Safe DxV (1:7) Safe DxV (sq.m/sec 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0	n Bed Slope	(m) D/S Area Contribut % 1 10/3 1	ng 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	4634414 4634414 4634414 4634415 4634415 4634415 4634415 4634415 4634415 4634415 4634415 4634416 4634416 4634416 4634417 463447 46347 463	8 9 4 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 9 7 8 9 0 1 2 3 4 7 8 2 3 2 5 6 3 8 8 1 8 8		23.88 16.94 12.54 12.54 12.54 12.57 20.76 2.21.66 2.1.66 2.1.73 2.29 6.7 2.21.64 2.1.73 11.83 5.11 4.4 2.2.77 13.2 7 13.3 1 1.93 5.11 1.4,42 2.77 13.2 7 13.3 1 1.93 2.5 2.2 9.82 9.82 9.82 9.82 9.82 9.82 9.82	7 7 7 9 2 8 8 9 1 9 4 9 6 4 8 5 6 5 1 6 0 5 8 2 6 3 7 1 0 1 1 9 6 5 9 3 2 8 4 4 4 1 2 5 9 8 0 9 5 7 9 1	
Name OVERFLC Name F A01-1x F A01-2x F A01-1x F A01-2x F A01-3x F A	DETAILS From A01-1 A01-2 A01-3 A01-3 A01-3 A01-3 A01-3 A01-4 A01-3 A01-4 A01-3 A01-4 A01-7 A01-4 A01-7 A01-4 A01-7 A01-1 A01-2 A02-1 A02-1 A03-2 A03-3 A03-4 A03-5 A03-1 A04-1 A01-1 A01-1 A01-1 A03-5 A03-4 A03-5 A03-4 A03-1 A01-1 A01-1 A01-1 A01-1 A03-5 A03-4 A03-5 A03-4 A03-5 A03-4 A03-1 A01-1 A01-1 A01-1 A01-1 A01-1 A02-2 A03-3 A03-4 A03-5 A03-4 A03-1 A01-1 A01-1 A01-1 A01-1 A01-1 A02-2 A03-3 A03-4 A03-5 A03-4 A03-5 A03-1 A01-1 A01-1 A01-1 A01-1 A01-1 A01-1 A01-1 A01-1 A01-1 A03-5 A03-4 A03-5 A03-4 A01-1	To DETAILS To A011-1 A01-3 PII243512 A01-4 A01-5 A01-6 A01-7 A01-8 A01-7 A01-8 A01-10 A01-11 A01-12 A01-14 A01-15 A01-14 A01-15 A01-14 A01-15 A01-14 A01-15 A01-12 A01-14 A01-15 A01-12 A01-12 A01-14 A01-12 A01-12 A01-12 A01-12 A01-12 A01-12 A01-12 A01-12 A01-12 A01-12 A01-12 A01-12 A01-22 A02-3 A02-2 A02-3 A02-2 A02-3 A02-4 A02-3 A02-2 A02-3 A02-2 A02-3 A02-2 A02-3 A02-2 A02-3 A02-2 A02-3 A02-4 A03-2	(m) Type Travel Time (min) 1 1 1 1 1 1 1 1 1 1 1 1 1	(m) Length (m) Spill Level (m)	U/S IL (m) Crest Length (m)	(m) D/S IL (m) Weir Coeff. C	(m) Slope (%) Cross Section 7.5 m road 7.5 m roa	Base Widt (m) Safe Depti Maior Store (m) 3 0.3 3	(m) ILB. Slope (1:?) SafeDepth Minor Stor (m) 0.15 0.1	etc R.B. Slop (1:?) Safe DxV (sg.m/se 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	n Bed Slope Slope (%) 4 3.2(4 3.2(4 3.2(4 3.2(4 3.2(4 3.2(4 4.3(4 4.2(4 4.4 4.2(4 4.4 4.4 4.4 4.4 4.4 4.4 4.4 4.4 4.4 4	(m) D/S Area Contribut % 10 10 10 10 10 10 10 10 10 10	ng 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	4634414 4634414 4634415 4634415 4634415 4634415 4634415 4634416 4634416 4634416 4634416 4634416 4634416 4634416 4634416 4634416 4634417 463447 46347 4	8 9 4 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 9 7 8 9 0 1 2 3 4 7 8 2 3 2 5 6 3 8 8 1 8 8 8		23.88 16.94 12.54 12.54 12.54 12.54 12.57 12.67 12.67 12.67 12.67 12.16 12.90 12.79 12.16 12.90 12.17 12.90 12.17 13.20 14.90 12.17 13.20 14.90 14.90 15.11 14.90 15.11 14.20 15.11 14.20 15.11 14.20 15.11 14.20 15.21 15.21 14.20 15.21	7 7 7 9 2 8 8 9 1 9 4 9 6 6 4 8 5 6 6 5 1 6 0 5 8 2 6 6 3 7 1 0 1 1 9 6 6 5 9 3 2 8 4 4 4 1 2 5 9 8 0 9 5 7 9 1 1	

F A09-1 F A09-2 F A09-3	A09-1 A09-2 A09-3	A09-3 A09-3 A01-19	1 1 1		7.5 m road 7.5 m road 7.5 m road	0.3 0.3 0.3	0.15 0.15 0.15	0.4 0.4 0.4	5.15 7.09 3.69	0 100 100	46344189 46344190 46344199	49.235 14.298 36.7
F A03-4	A06-1	A01-8	1		Swale with	0.45	0.3	1	5.96	0	46344186	38.669
	ER DETAIL											
Name	Туре		Safe Covei Co									
P A01-1	Concrete,		0.6	0.85								
P A01-2	Concrete,		0.6	0.96								
P A01-3	Concrete,		0.6	0.95								
P249763	Concrete,		0.6	0.93								
P A01-4 P A01-5	Concrete, Concrete,		0.6 0.6	0.93 0.98								
P A01-5	Concrete,		0.6	1.11								
P A01-0	Concrete,		0.6	1.2								
P A01-8	Concrete,		0.6	1.12								
P A01-9	Concrete,		0.6	1.05								
	Concrete,		0.6	0.78								
	Concrete,		0.6	0.78								
P A01-12	Concrete,	600	0.6	0.87								
P A01-13	Concrete,	600	0.6	0.92								
P A01-14	Concrete,	750	0.6	0.84								
	Concrete,		0.6	0.92								
	Concrete,		0.6	0.95								
	Concrete,		0.6	1								
	Concrete,		0.6	1.03								
	Concrete,		0.6	1.47								
	Concrete,		0.6	1.47								
P A01-21 P A02-1			0.6 0.6	1.5 1.06								
P A02-1 P A02-2	Concrete,		0.6	1.17								
P A02-2 P A02-3	Concrete, Concrete,		0.6	1.17								
P A02-3	Concrete,		0.6	1.32								
P A02-5	Concrete,		0.6	1.18								
P A02-6	Concrete,		0.6	1.18								
P A02-7	Concrete,		0.6	1.14								
P A02-8	Concrete,		0.6	1.14								
P A03-1	Concrete,	375	0.6	1.03								
P A03-2	Concrete,	375	0.6	1.05								
P A03-3	Concrete,		0.6	1.29								
P A03-4	Concrete,		0.6	0.97								
P A03-5	Concrete,		0.6	0.97								
P A04-1	Concrete,		0.6	0.88								
P A04-2	Concrete,		0.6	0.88								
P A04-3	Concrete,		0.6	1.02								
P A04-4	Concrete,		0.6	1.06								
P A04-5 P A07-1	Concrete, Concrete,		0.6 0.6	1.08 1.11								
P A07-1 P A08-1	Concrete,		0.6	0.98								
P A10-1	Concrete,		0.6	0.85								
P A10-2	Concrete,		0.6	1.07								
P A11-1	Concrete,		0.6	0.92								
P A12-1	Concrete.		0.6	0.83								
Pipe67166	6 uPVC, not	105	0.3	0.24 Unsafe								
Pipe50638	B uPVC, und	386	0.5	0.41 Unsafe								
Pipe16451	Concrete,	375	0.6	0.39 Unsafe								
	Concrete,		0.6	0.55 Unsafe								
	6 uPVC, not	105	0.3	0.49								
	5 uPVC, und		0.5	0.21 Unsafe								
	8 uPVC, not	242	0.3	0.16 Unsafe								
	8 uPVC, not	242	0.3	0.26 Unsafe								
	B uPVC, not	242	0.3	0.36								
P A09-1	Concrete,		0.6	0.81								
P A09-2	Concrete,		0.6	0.92								
P A09-3	Concrete,		0.6	1.02								
P A06-1	Concrete,		0.6	0.89								

These pipes have non-return valves: Pipe506382, Pipe164513, Pipe391453, Pipe671689

Appendix C

DRAINS Modelling Results

DRAINS results prepared from Version 2022.012

PIT / NODE D)FTAILS			Version 8			
		Max Pond	Max Surfac	-	Min	Overflow	Constraint
		HGL	Flow Arrivi		Freeboard	(cu.m/s)	
			(cu.m/s)	(cu.m)	(m)	· ,	
A01-1	96		0.032		1.11	0	None
A01-2	95.85		0.016		1.25	0	None
A01-3	95.26		0.022		1.13	0	None
Pit243512	95.09		0.018		0.93	0	None
A01-4	94.94		0		0.9	0	None
A01-5	94.76		0.013		0.68	0	Inlet Capacity
A01-6	94.59		0.018		0.25	0	None
A01-7	93.25		0.017		0.71	0	None
A01-8	92.1		0.039		0	0.046	Outlet System
A01-9	90.6		0.15		0.08	0	None
A01-10	89.35		0.129		0.4	0	None
A01-11	89.32		0.032		0.24	0	None
A01-12	88.96		0.035		0.33		Inlet Capacity
A01-13	88.78		0.11		0.27	0.009	Inlet Capacity
A01-14	87.87		0.051		1.09	0	None
A01-15	87.84		0.023		1.02	0	None
A01-16	87.76		0.025		1.02	0	None
A01-17	87.7		0.011		1.05	0	None
A01-18	87.65	88.75	0.018	0.1	1.07	0	Inlet Capacity
A01-19	87.54		0.08		1.43	0.002	Inlet Capacity
A01-20	87.32		0.02		1.45	0	Inlet Capacity
A01-21	87.19		0.016		1.54	0	None
A01-22	86.42		0				
A02-1	97.94		0.694		0	0.575	Outlet System
A02-2	97.57		0		0.03		None
A02-3	97.29		0.842		0.01	0.402	Inlet Capacity
A02-4	95.35		0.722		0		Outlet System
A02-5	94.3		0.722		0		Outlet System
A02-6	91.85		0.677		0.01		Inlet Capacity
A02-7	88.59		0.55		1.5		Inlet Capacity
A02-8	88.41		0.303		1.11		Inlet Capacity
A03-1	95.6		0.079		0.03		Inlet Capacity
A03-2	95.53	95.61	0.098	0.3	0		Outlet System
A03-3	95.29		0.082		0.35		Inlet Capacity
A03-4	95.06		0.022		0.53		None
A03-5	94.82		0.062		0		Outlet System
A04-1	89.17		0.031		0.97		None
A04-2	89.17		0.067		0.53		None
A04-3	89.07		0.01		0.46		None
A04-4	89.04		0.052		0.42		Inlet Capacity
A04-5	88.92		0.027		0.19		None
A07-1	92.14		0.085		0.01		Inlet Capacity
A08-1	93.27		0.137		0.7		None
A10-1	94.31		0		0.29		None
A10-2	94.3		0.026		0.27		None
A011-1	95.36		0.069		1.02		Inlet Capacity
A012-1	94.97	00.0	0.046	0.4	0.85		None
Pit649050	89.6	89.6	0.017	3.4	0		Outlet System
Pit649049	89.6	89.61	0.012	1.6	0		Outlet System
Pit649048	89.6	89.62	0.01	0.5	0		Outlet System
A05-1	89.36		0		0.24	0	None
N779497	92.22		0.111		^	^	Outlat System
Pit649043	92.2		0 115		0	0	Outlet System
N779498	90.97		0.115				

Pit649042	90.91	0	0.59	0 None
A09-1	90.55	0	0.95	0 None
A09-2	90.28	0.027	1.06	0 None
A09-3	89.08	0.006	1.24	0 None
A06-1	92.16	0	0.04	0 None

SUB-CATCHMENT	DETAILS	3
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Name	Max	Paved	Grassed Pave		ssed Supp.	Due to Storm
	Flow Q (cu.m/s)	Max Q (cu.m/s)	Max Q Tc (cu.m/s) (min)	Tc (mir	Tc n) (min)	
C A01-1	0.026		0	5	10 (11111)	0 1% AEP, 5 min burst, Storm 1
C A01-2	0.013		0	5	10	0 1% AEP, 5 min burst, Storm 1
C A01-3	0.018		0	5	10	0 1% AEP, 5 min burst, Storm 1
C A01-4	0.015		0	5	10	0 1% AEP, 5 min burst, Storm 1
C A01-5	0.010		0	5	10	0 1% AEP, 5 min burst, Storm 1
C A01-6	0.011		0	5	10	0 1% AEP, 5 min burst, Storm 1
C A01-7	0.014		0	5	10	0 1% AEP, 5 min burst, Storm 1
C A01-8	0.026		0	5	10	0 1% AEP, 5 min burst, Storm 1
C A01-9	0.014		0	5	10	0 1% AEP, 5 min burst, Storm 1
C A01-10	0.014		0	5	10	0 1% AEP, 5 min burst, Storm 1
C A01-10	0.011		0	5	10	0 1% AEP, 5 min burst, Storm 1
C A01-12	0.011		0	5	10	0 1% AEP, 5 min burst, Storm 1
C A01-12	0.052		0	5	10	0 1% AEP, 5 min burst, Storm 1
C A01-13	0.032		0	5	10	0 1% AEP, 5 min burst, Storm 1
C A01-14	0.027		0	5	10	0 1% AEP, 5 min burst, Storm 1
C A01-13	0.018			5	10	0 1% AEP, 5 min burst, Storm 1
C A01-10	0.02		0	5	10	0 1% AEP, 5 min burst, Storm 1
C A01-17 C A01-18	0.009		0	5	10	0 1% AEP, 5 min burst, Storm 1
C A01-18	0.01		0	5	10	0 1% AEP, 5 min burst, Storm 1
C A01-19	0.004	0.004		5	10	0 1% AEP, 5 min burst, Storm 1
C A01-20	0.01		0 0	5	10	0 1% AEP, 5 min burst, Storm 1
					10	
C A02-1 C A02-3	0.067 0.011		0	5 5	10	0 1% AEP, 5 min burst, Storm 1
			0	5		0 1% AEP, 5 min burst, Storm 1
C A02-4	0.039 0.01	0.039	0 0	5 5	10 10	0 1% AEP, 5 min burst, Storm 1
C A02-5 C A02-6	0.01		0	5	10	0 1% AEP, 5 min burst, Storm 1
				5		0 1% AEP, 5 min burst, Storm 1
C A02-7	0.023		0		10	0 1% AEP, 5 min burst, Storm 1
C A02-8	0.011		0	5	10	0 1% AEP, 5 min burst, Storm 1
C A03-1	0.063		0	5	10	0 1% AEP, 5 min burst, Storm 1
C A03-2	0.041		0	5	10	0 1% AEP, 5 min burst, Storm 1
C A03-3	0.066		0	5	10	0 1% AEP, 5 min burst, Storm 1
C A03-4	0.018		0	5	10	0 1% AEP, 5 min burst, Storm 1
C A03-5	0.016		0	5	10	0 1% AEP, 5 min burst, Storm 1
C A04-2	0.054		0	5 5	10	0 1% AEP, 5 min burst, Storm 1
C A04-3	0.006		0		10	0 1% AEP, 5 min burst, Storm 1
C A04-4	0.042		0	5	10	0 1% AEP, 5 min burst, Storm 1
C A04-5	0.015		0	5	10	0 1% AEP, 5 min burst, Storm 1
C A07-1	0.06		0	5	10	0 1% AEP, 5 min burst, Storm 1
C A08-1	0.01	0.01	0	5	10	0 1% AEP, 5 min burst, Storm 1
C A10-2	0.021		0	5	10	0 1% AEP, 5 min burst, Storm 1
C A11-1	0.056		0	5	10	0 1% AEP, 5 min burst, Storm 1
C A12-1	0.034		0	5	10	0 1% AEP, 5 min burst, Storm 1
Cat101892			0	8.5	10	0 1% AEP, 10 min burst, Storm 1
C Bypass	0.004		0	5	5	2 1% AEP, 5 min burst, Storm 1
Cat583675				5	7.5	2 1% AEP, 5 min burst, Storm 1
Cat583674			0.001	5	7.5	2 1% AEP, 5 min burst, Storm 1
Cat583670			0.001	5	7.5	2 1% AEP, 5 min burst, Storm 1
C A05-1	0.253		0	7.5	10	0 1% AEP, 10 min burst, Storm 8
C A06-1	0.089		0	5	10	0 1% AEP, 5 min burst, Storm 1
C A09-1	0.093	0.093	0	5	10	0 1% AEP, 5 min burst, Storm 1

C A09-2	0.022	0.022	0	5	10	0 1% AEP, 5 min burst, Storm 1
C A09-3	0.005			5		0 1% AEP, 5 min burst, Storm 1
				-		······································
PIPE DET	AILS					
Name	Max Q	Max V	Max U/S	Max D/S	Due to Storm	
	(cu.m/s)	(m/s)	HGL (m)	HGL (m)		
P A01-1	0.026	0.87	96.002	95.848	1% AEP, 5 min	burst, Storm 1
P A01-2	0.038				1% AEP, 5 min	
P A01-3	0.11				1% AEP, 5 min	
P249763	0.121				1% AEP, 5 min	
P A01-4	0.152				1% AEP, 10 mir	
P A01-5	0.162				1% AEP, 10 mir	
P A01-6	0.35				1% AEP, 5 min	
P A01-7	0.375				1% AEP, 10 mir	
P A01-8 P A01-9	0.468 0.495				1% AEP, 5 min 1% AEP, 5 min	
P A01-9 P A01-10	0.493				1% AEP, 3 min	
P A01-10	0.53				1% AEP, 10 mir	
P A01-12	0.54		88.828		1% AEP, 10 mir	
P A01-13	0.679				1% AEP, 10 mir	
P A01-14	0.709				1% AEP, 10 mir	
P A01-15	0.727				1% AEP, 10 mir	
P A01-16	0.745				1% AEP, 10 mir	
P A01-17	0.753	1.72	87.664	87.649	1% AEP, 10 mir	n burst, Storm 5
P A01-18	0.764	1.73	87.61	87.539	1% AEP, 10 mir	n burst, Storm 5
P A01-19	0.818	1.94	87.371	87.324	1% AEP, 10 mir	n burst, Storm 5
P A01-20	0.827	1.9	87.217	87.187	1% AEP, 10 mir	n burst, Storm 5
P A01-21	1.471				1% AEP, 20 mir	
P A02-1	0.288		97.655		1% AEP, 45 mir	
P A02-2	0.288		97.367		1% AEP, 45 mir	
P A02-3	0.371				1% AEP, 10 mir	
P A02-4	0.42				1% AEP, 5 min	
P A02-5	0.464				1% AEP, 5 min	
P A02-6	0.58 0.752				1% AEP, 20 mir	
P A02-7 P A02-8	0.752				1% AEP, 10 mir 1% AEP, 10 mir	
P A02-0	0.05		95.539		1% AEP, 5 min	
P A03-2	0.104		95.307		1% AEP, 5 min	
P A03-3	0.155		95.098		1% AEP, 5 min	
P A03-4	0.17				1% AEP, 5 min	
P A03-5	0.183				1% AEP, 5 min	
P A04-1	0.016				1% AEP, 5 min	
P A04-2	0.064	0.58	89.072	89.065	1% AEP, 10 mir	n burst, Storm 5
P A04-3	0.069	0.62	89.048	89.037	1% AEP, 10 mir	n burst, Storm 5
P A04-4	0.103				1% AEP, 10 mir	
P A04-5	0.121		88.817		1% AEP, 10 mir	
P A07-1	0.061				1% AEP, 5 min	
P A08-1	0.034		93.248		1% AEP, 10 mir	
P A10-1	0.022				1% AEP, 10 mir	
P A10-2	0.044				1% AEP, 20 mir	
P A11-1 P A12-1	0.055		95.274		1% AEP, 5 min	
P A12-1 Pipe67168	0.033 3 0.015				1% AEP, 5 min 1% AEP, 45 mir	
Pipe67168					1% AEP, 45 mir 1% AEP, 10 mir	
Pipe67168					1% AEP, 10 mir	
Pipe16451			89.425		1% AEP, 45 mir	
P A05-1	0.101		89.357		1% AEP, 45 mir	
P700876	0.094				1% AEP, 5 min	
Pipe67166					1% AEP, 5 min	

urst, Storm 1
urst, Storm 1
u u u u

CHANNEL DETAILS

Name Max Q Max V (cu.m/s) (m/s)

Due to Storm

OVERFLOW ROUTE DETAILS								
	Max Q U/S M		afe Q M	/lax D	Max DxV	Max Width Ma	ax V	Due to Storm
F A01-1x	0	0.056	0.851	0.07	0.1			1% AEP, 5 min burst, Storm 1
F A01-2x	0	0.018	0.865	0.049	0.06			1% AEP, 5 min burst, Storm 1
F A01-3x	0	0.015	0.839	0.045	0.05			1% AEP, 5 min burst, Storm 1
OF236497	0	0	0.839	0	0		0	
F A01-4x	0	0.011	0.863	0.041	0.05		1.1	1% AEP, 5 min burst, Storm 1
F A01-5x	0	0.014	0.786	0.044	0.06	0.58	1.27	1% AEP, 5 min burst, Storm 1
F A01-6	0	0.013	0.778	0.042	0.05	0.54	1.29	1% AEP, 5 min burst, Storm 1
F A01-7	0	0.026	0.655	0.05	0.08	0.78	1.69	1% AEP, 5 min burst, Storm 1
F A01-8	0.046	0.057	0.604	0.063	0.12	1.24	1.96	1% AEP, 10 min burst, Storm 8
F A01-9	0	0.017	0.705	0.045	0.07	0.62	1.49	1% AEP, 5 min burst, Storm 1
F A01-10	0	0.011	0.895	0.042	0.04	0.52	1.05	1% AEP, 5 min burst, Storm 1
F A01-11	0	0.014	1.11	0.052	0.04	0.86	0.81	1% AEP, 5 min burst, Storm 1
F A01-12	0	0.027	1.463	0.029	0.01	4	0.49	1% AEP, 5 min burst, Storm 1
F A01-13	0.009	0.034	1.464	0.081	0.05	1.84	0.6	1% AEP, 10 min burst, Storm 8
F A01-14	0	0.018	1.287	0.061	0.04	1.18	0.69	1% AEP, 5 min burst, Storm 1
F A01-15	0	0.02	1.338	0.065	0.04	1.31	0.64	1% AEP, 5 min burst, Storm 1
F A01-16	0	0.009	1.369	0.051	0.03	0.82	0.56	1% AEP, 5 min burst, Storm 1
F A01-17	0	0.01	1.291	0.051	0.03	0.82	0.61	1% AEP, 5 min burst, Storm 1
F A01-18	0	0.01	1.201	0.049	0.03	0.77		1% AEP, 5 min burst, Storm 1
F A01-19	0.002	0.011	1.081	0.047	0.04	0.71	0.83	1% AEP, 5 min burst, Storm 1
F A01-20	0	0	0.79	0	0	0	0	
F A01-21	0	0	0.79	0	0	0	0	
F A02-1x	0.575	0.586	0.56	0.051	0.07		1.45	1% AEP, 10 min burst, Storm 10
F A02-2x	0	0.011	0.901	0.044	0.04			1% AEP, 5 min burst, Storm 1
F A02-3x	0.402	0.432	0.731	0.127	0.31	3.38		1% AEP, 10 min burst, Storm 7
F A02-4x	0.433	0.439	0.603	0.121	0.34			1% AEP, 10 min burst, Storm 8
F A02-5x	0.414	0.426	0.594	0.119	0.34			1% AEP, 10 min burst, Storm 8
F A01-19x	0.302	0.307	0.588	0.108	0.28			1% AEP, 10 min burst, Storm 7
F A01-20x	0.138	0.139	0.642	0.086	0.18			1% AEP, 10 min burst, Storm 7
F A01-21x	0.042	0.042	1.201	0.077	0.07			1% AEP, 10 min burst, Storm 7
F A03-1	0.013	0.051	0.948	0.114	0.04			1% AEP, 5 min burst, Storm 1
OF169744	0.013	0.028	1.43	0.026	0.02			1% AEP, 10 min burst, Storm 5
F A03-3	0.014	0.051	1.084	0.11	0.05			1% AEP, 5 min burst, Storm 1
F A03-4x	0	0.016	0.825	0.046	0.06			1% AEP, 5 min burst, Storm 1
F A03-5	0.027	0.034	0.772	0.058	0.09			1% AEP, 10 min burst, Storm 5
F A04-1x	0	0.054	0.763	0.067	0.11			1% AEP, 5 min burst, Storm 1
F A04-2	0	0.006	0.939	0.036	0.03			1% AEP, 5 min burst, Storm 1
F A04-3	0	0.042	1.251	0.08	0.06			1% AEP, 5 min burst, Storm 1
F A04-4	0.005	0.019	1.453	0.026	0.01			1% AEP, 10 min burst, Storm 8
F A04-5	0	0.052	1.464	0.093	0.06			1% AEP, 5 min burst, Storm 1
F A07-1x	0.015	0.015	0.597	0.041	0.06			1% AEP, 5 min burst, Storm 1
F A08-1	0	0.06	0.662	0.066	0.12			1% AEP, 5 min burst, Storm 1
F A10-1	0	0	0.594	0	0		0	
F A010-2	0	0.022	0.593	0.046	0.08			1% AEP, 5 min burst, Storm 1
F A11-1	0	0.034	0.847	0.06	0.08	1.14	1.34	1% AEP, 5 min burst, Storm 1

F A012-1	0	0.063	1.163	0.087	0.08	2.04	0.93 1% AEP, 5 min burst, Storm 1
OF130487	0.593	0.642	1.201	0.189	0.27	5.34	1.42 1% AEP, 10 min burst, Storm 1
F Bypass	0.004	0.004	0.407	0.008	0	4.76	0.24 1% AEP, 5 min burst, Storm 1
OF667343	0.007	0.007	1.479	0.022	0.01	4	0.25 1% AEP, 45 min burst, Storm 2
OF667319	0	0	0.015	0	0	0	0
OF667323	0	0	0.015	0	0	0	0
OF437332	0	0	1.479	0	0	0	0
OF154692	0	0	1.463	0	0	0	0
OF695921	0	0	1.51	0	0	0	0
OF695922	0	0	1.51	0	0	0	0
F A09-1	0	0	0.703	0	0	0	0
F A09-2	0	0.005	0.591	0.026	0.03	0.3	1.16 1% AEP, 5 min burst, Storm 1
F A09-3	0	0.064	0.814	0.072	0.11	1.54	1.56 1% AEP, 5 min burst, Storm 1
F A03-4	0	0	1.51	0	0	0	0

DETENTION BASIN DETAILS									
Name	Max WL	MaxVol	Max Q	Max Q	Max Q				
			Total	Low Level	High Level				
OSD B	89.62	185.4	0.101	0.101	0				

Run Log for Doran Drive Showground DRAINs Model run at 12:18:52 on 2/6/2022 using version 2022.012 Upwelling occurred at: Pit649050, A03-5, A02-6, A02-5, A02-4, A02-3, A02-1, A01-8 Freeboard was less than 0.15m at Pit649049, Pit649048, A07-1, A06-1, A03-2, A03-1, A02-2, A01-9 The maximum flow in these overflow routes is unsafe: F A02-1x

Appendix D

Drawings

Revision T6 – 10-Jun-2022 Prepared for – Deicorp – ABN: 73 630 425 955