WATER MANAGEMENT PLAN

COSTCO DISTRIBUTION DEPOT, OAKDALE

June 2017

COSTCO

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ISSUE AND REVISION RECORD

Issue	Date	Purpose	Prepared By	Checked By	Approved By
P1	23/03/17	Review	SF	SW	SW
A	14/06/17	Development Application	SF	SW	SW

1 INTRODUCTION

1.1 Purpose of Report

This Stormwater Management Report has been prepared by ACOR Consultants as part of the Development Application submission for the proposed Costco Distribution Depot to be constructed at the Oakdale Industrial Estate.

This report documents the methodology involved in determining the design of the proposed stormwater drainage system.

1.2 Guidelines and Standards

The local government authority is Penrith City Council, which is located in Western Sydney.

The design of these works has been undertaken in accordance with the relevant sections of the following documents:

- Penrith Council Design Guidelines for Engineering Works
- Penrith Council Stormwater Drainage Specification for Building Developments
- Penrith Council WSUD Technical Guidelines
- Penrith Council DCP C3 Water Management

It is noted that the subject development is located within the Oakdale South Industrial Estate, being lot 4A, which has been approved by NSW Planning and Environment. As such, the On-site Detention and Water Quality requirements for the site have been previously allowed for as part of the Oakdale South Industrial Estate master plan. Reference is therefore made to the 'Civil, Stormwater and Infrastructure Services Report' prepared by AT&L, Report no. 14-193-R001, Revision 10, Dated September 2016.

1.3 SEARS (Secretary's Environmental Assessment Requirements)

Key Issue	Response	Further Details
Soils and Water		
A description of the water demands, servicing arrangements and a breakdown of water supplies.	An analysis of the expected water usages and sources has been carried out and detailed in this report.	Refer section 3.3.
A description of measures to minimise water use.	In an effort to reduce water demand, a rainwater tank has been installed to service 50% of irrigation, toilet flushing and refrigeration demand. Water conservative devices have been specified.	Refer Section 3.3.
A detailed water balance.	A detailed water balance has been included in this report.	Refer Section 3.3.
A description of all wastewater generated on-site.	A description of waste water generated by the site has been	Refer Section 3.4.

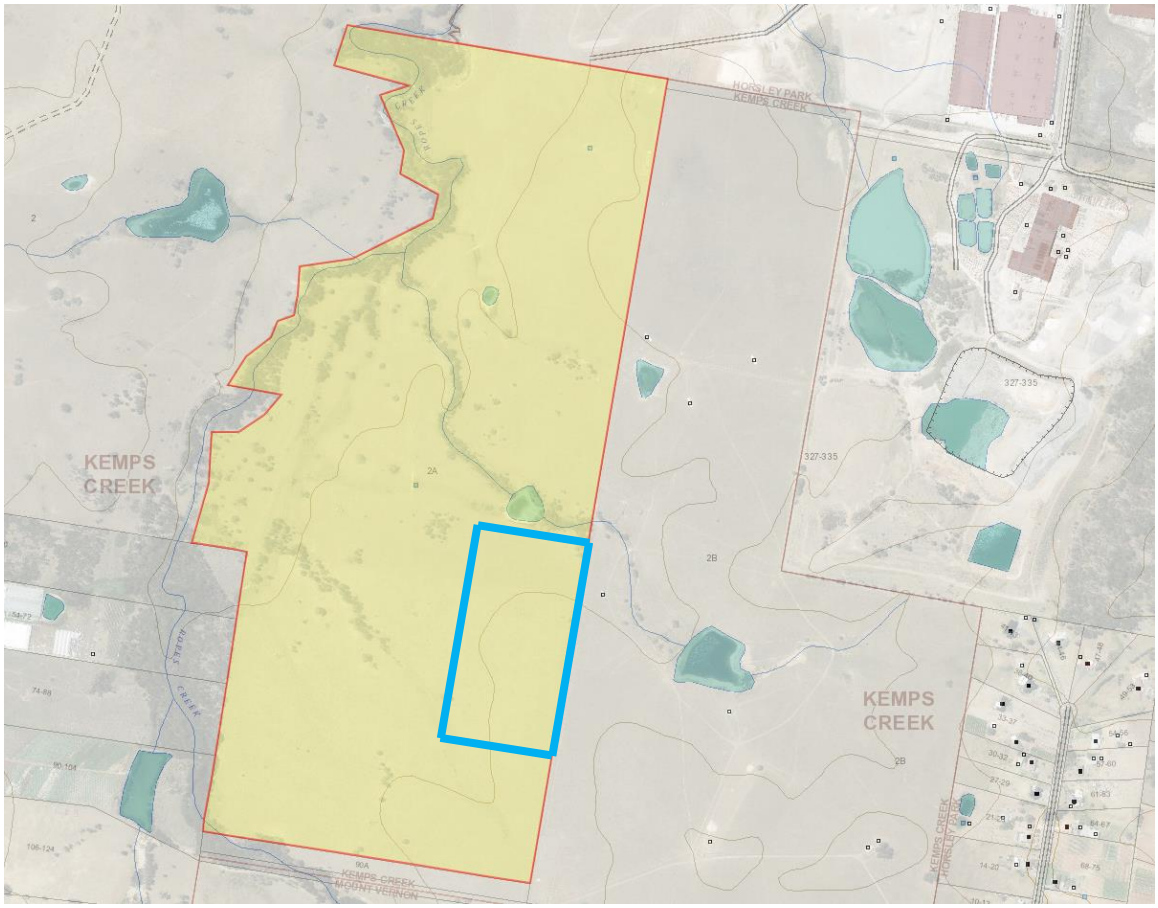
Key Issue	Response	Further Details
	detailed in this report.	
A description of the proposed erosion and sediment controls during construction and operation.	The proposed methods for managing erosion and sedimentation have been described within this report.	Refer to Section 4
A description of the surface and stormwater management system, including on-site detention, and measures to treat or re-use water.	On-site detention and water quality was addressed as part of the sub-division development. The site run-off is collected in the underground stormwater system before being discharged to an existing bio-retention basin, via a gross pollutant trap.	Refer to sections 3.2, 3.5, 3.6.
An assessment of potential surface and groundwater impacts associated with the development.	For surface run-off, refer to the above. A Geotechnical and Hydrological Investigation undertaken by Pells Sullivan Meynink (PSM) in September 2015 for the entire Oakdale South Estate highlighted the only groundwater encountered within the entire site is adjacent Ropes Creek. As Lot 4A is located 460m from Ropes creek and minimal cut is required to develop the site, the likelihood of encountering ground water is negligible.	
Details of water Sensitive Urban Design measures implemented.	Rainwater re-use and water demand reduction has been included. The remainder of the Water Sensitive Urban Design measures are accounted for as part of the sub-division works.	
An assessment of the impact of flooding on the proposed development for the full range of flood events up to the probable maximum flood.	A Flood Impact Assessment for the Proposed Oakdale South Estate has been undertaken by Cardno in August 2016. This assessment concluded the entire development did not have any adverse impacts on adjoining properties from a flood perspective. Lot 4A was included within this assessment. As such it is deemed the development of Lot 4A has no flooding impacts for all storm events up to the PMF within the surrounding area. It is worth noting the expected 100 year ARI flood level (post-development) in the immediate vicinity of Lot 4A is at RL 64.2 adjacent the northern site boundary. Given the proposed FFL of the building is RL70.55,	

Key Issue	Response	Further Details
	some 6.35m above the 100 yr ARI level, it has been deemed that freeboard is sufficient.	
An assessment of the impact of the proposed development on flood behaviour.	A Flood Impact Assessment for the Proposed Oakdale South Estate has been undertaken by Cardno in August 2016. This assessment concluded the entire development did not have any adverse impacts on the adjoining properties from a flood perspective. Lot 4A was included within this assessment. As such it is deemed that the development of Lot 4A has no flooding impacts for all storm events up the PMF within the surrounding area.	
Details of impact mitigation, management and monitoring measures.	A management and monitoring program is detailed within this report.	Refer to section 4.5

2 EXISTING CONDITIONS

2.1 Existing Site Description

The proposed site forms part of an existing lot described as Lot 12 of DP1178389, which is part of the Oakdale South Industrial Precinct Development.



Lot 12 DP 1178389 – Six Maps

The subject lot is shown approximately, bound in red and highlighted in yellow above. The proposed site, shown outlined in blue, is approximately rectangular in shape, and is part south eastern section of the subject lot. The proposed site approximately 14.28 hectares.

2.2 Existing Topography and Stormwater Drainage

The existing site topography and stormwater drainage for the site is best considered as a whole, reference is therefore made to the AT&L report note in section 1.2 of this report.

As noted in section 1.2 of this report, on-site detention and water quality has been considered and designed for as part of the master plan for the Oakdale Industrial Estate application. These requirements are met by way of a bio-retention basin located adjacent the north-western corner of the proposed site.

3 PROPOSED DEVELOPMENT

3.1 Proposed Site Development

The proposed warehouse and distribution facility to be operated by Costco Wholesale will comprise the following:

- A warehouse building with GFA of 33,588m^2
- Office space with GFA of 1,689m^2
- Guard house with GFA of 72m^2
- Plant room with GFA of 40m^2
- Switch room with GFA of 145m^2
- 169 loading docks, hardstand area around the warehouse building
- Car parking for 328 spaces with access via Estate Road 1
- A separate truck entry / exit point from Estate Road 1
- On-lot stormwater, infrastructure, fire services and pump room
- Signage
- Landscaping.

It is proposed to stage the construction of the project, the extent of each stage is shown on drawing DAC4.01.

The proposed layout is shown on drawing DAC1.01 attached in Appendix A.

3.2 Proposed Stormwater Drainage Layout

Based on the Council guidelines indicated in Section 1.2, the proposed minor drainage system for a commercial/business zone development is to be designed to convey the 20 year ARI storm event. The major drainage system is to be designed to convey the 100 year ARI storm event, and can include overland flow paths.

Stormwater from roof and pavement areas is collected and directed to the underground stormwater system, where it is conveyed to the north western corner of the site before being treated by a GPT (Gross Pollutant Trap) and discharged to bio-detention basin ‘E’, as shown on the master plan.

The proposed piped stormwater system has been designed to convey the 20 year ARI storm event, without any overland flow paths forming. During the 100 year ARI storm event, the stormwater is conveyed via overland flow to the north-western corner and discharged to the detention basin.

For further details refer to the DRAINS results that are contained in the Appendix.

3.3 Water Balance

This section covers the water balance for the proposed stage 1 of the development, future analysis and consideration should be given to later stages.

The proposed COSTCO Distribution Centre contains the hydraulic fixtures as indicated in the following table. Fixtures are 3-4 Star Water Efficiency Labelling Standards rated.

Table 3.1 – Fixture Ratings

Fixture	Water Efficiency Labelling Standards Scheme	Recycled Water
Toilet - Flushing	4-star	No
Toilet – Hand Basin Taps	4-star	No
Staff Room – Sink Taps	4-star	No
Cleaners Area – Taps	3-star	No
Landscaping - Taps	3-star	Yes

Table 3.2 – Water Demand

End Water Use	Demand (L/day)	Percentage of Total demand	Assumptions
Irrigation	13970	32.7%	Based on 0.4kL/year/m²
Kitchen Sink	300	0.7%	Based on 2L/day/employee
Toilets & Urinals	2625	6.1%	4 star fixture, 5 uses/day/employee
Hand Washing	1406	3.3%	4 star fixture, 5 uses/day/employee
Cleaning	400	0.9%	Assumed volume
Refrigeration	21920	51.3%	Based on Costco Projections for Stage 1
Miscellaneous	2138	5.0%	Based on 5% of total use, reduced from 10% given high irrigation and refrigeration requirements
Total	42760	100.0%	

Note: The above table is based on an average projected number of employees of 150 for Stage 1.

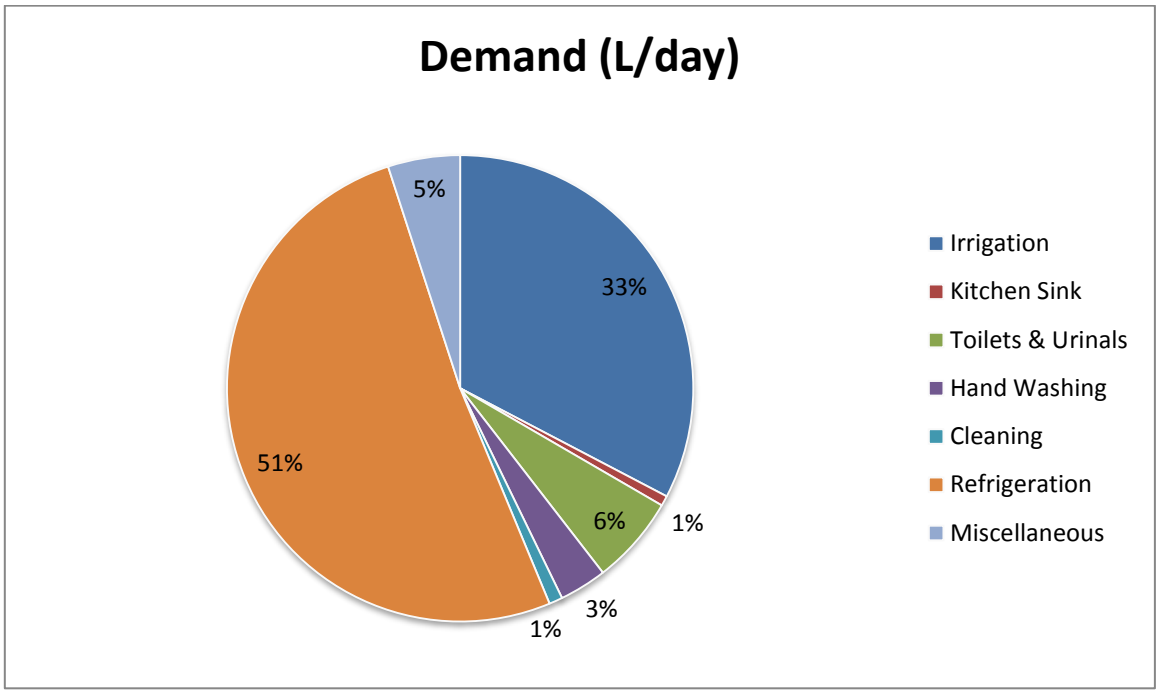


Figure 3.1 – Water Demand Chart

The total water demand of the Stage 1 of the development is projected to be 42,760 litres per day, so to achieve a 50% reduction in potable water use we need to meet 21,380 litres per day.

It is proposed to install 6,382m² of low water use, hardy plant species which don't require irrigation, providing a water saving of 6,994 litres per day.

The proposed development also includes the installation of 450kL of rainwater storage, collecting a minimum of 1.8 hectares of roof area. Using the MUSIC software programme water balance feature, this rainwater tank provides a water saving of 14,809 litres per day.

The combination of hardy plant species, and the installation of rainwater tank storage, this provides a total reduction of 21,803 Litres per day, in excess of the required 21,380 Litres per day.

It is therefore concluded that the proposed development provides a >50% reduction in total water demand from potable sources.

3.4 Wastewater

It is assumed that any water noted in the previous section, used for purposes other than irrigation or refrigeration, ends up as wastewater. Therefore the expected site wastewater loadings are 6,870 litres per day.

3.5 Proposed On-Site Stormwater Detention

As noted previously, on-site detention forms part of the subdivision master plan, and reference is made to the report prepared by AT&L, noted in section 1.2 of this report.

3.6 Proposed Water Quality Initiatives

Gross Pollutant Traps have been provided prior to discharge from the site, in order to prevent larger contaminants from entering to bio-detention basin. The bio-detention basin has been designed to treat the stormwater run-off from the site, meeting the stipulated reduction values for TSS, TN and TP. For further details refer to the AT&L report noted in section 1.2 of this report.

4 SEDIMENTATION AND EROSION CONTROL

4.1 Sedimentation and Erosion Control (Construction)

A Soil and Water Management Plan (SWMP) has been prepared in accordance with 'Managing Urban Stormwater – Soils and Construction', refer to Civil Drawings in Appendix B of this report.

4.2 Sources of Pollution

The activities and aspects of the works that have potential to lead to erosion, sediment transport, siltation and contamination of natural waters include:

- Earthworks undertaken immediately prior to rainfall periods
- Work areas that have not been stabilised
- Extraction of construction water from waterways during low rainfall periods
- Clearing of vegetation and the methods adopted, particularly in advance construction works
- Stripping of topsoil, particularly in advance of construction works
- Works within the drainage paths, including depressions and waterways
- Stockpiling of excavated materials
- Storage and transfer of oils, fuels , fertilisers and chemicals
- Maintenance of plant and equipment
- Ineffective implementation of erosion and sediment control measures
- Inadequate maintenance of environmental control measures
- Time taken for rehabilitation/revegetation of disturbed areas.

4.3 Potential Impacts

The major potential impacts on the riparian environment relate to erosion of distributed areas or stockpiles and sediment transportation. Potential adverse impacts from erosion and sediment transportation can include:

- Loss of topsoil
- Increased water turbidity
- Decreased levels of dissolved oxygen
- Changed salinity levels
- Changed pH levels
- Smothering of steam beds and aquatic vegetation
- Reduction in aquatic habitat diversity
- Increased maintenance costs
- Decrease in waterway capacity leading to increased flood levels and durations.

4.4 Construction Methodology

The following construction methodology will be followed to minimise the impact of sedimentation due to construction works:

- Diversion of "clean" water away from the disturbed areas and discharge via suitable scour protection
- Provision of hay bale type flow diverters to catch drainage and divert to "clean" water drains.

- Diversion of sediment-laden water into temporary sediment control basins to capture the design storm volume and undertake flocculation (if required)
- Provision of construction traffic shaker grids and wash-down to prevent vehicles from carrying soils beyond the site
- Provision of catch drains to carry sediment-laden water to sediment basins
- Provision of silt fences to filter and retain sediments at source
- Where future construction and building works are not proposed, the rapid stabilisation of disturbed and exposed ground surfaces with hydro-seeding

4.5 Site Inspection and Maintenance

The inspection and maintenance requirements outlined in this section will need to be carried out as long as either earthworks or quarrying is being conducted and all areas re-established.

The contractor's site Superintendent will inspect the site after every rainfall event and at least weekly, and will:

- Inspect and assess the effectiveness of the SWMP and identify any inadequacies that may arise during normal work activities or from a revised construction methodology. Construction additional erosion and sediment control works as necessary to ensure the desired protection is given to downstream lands and waterways
- Ensure that drains operate properly and to effect any repairs
- Removed spilled sand or other materials from hazard areas, including lands closer than 5 metres from areas of likely concentrated or high velocity flows, especially waterways and paved areas
- Remove trapped sediment whenever less than design capacity remains in the structure
- Ensure rehabilitated lands have effectively reduced the erosion hazard and to initiate upgrading or repairs as appropriate
- Maintain erosion and sediment control measures in a fully functioning condition until all construction activity is completed and the site has been rehabilitated
- Remove temporary soil conservation structures as the last activity in the rehabilitation

5 SUMMARY

5.1 Stormwater Run-off

The majority of the proposed Costco development drains to the existing single outlet point located in the north-western corner of the site, which is then piped to the detention/bio-retention basin that is installed as part of the sub-division stage.

5.2 Water Cycle

A detailed water cycle analysis has been carried out and a reduction of 50% of potable water demand has been achieved with the use of hardy / drought tolerant plant species, and the installation of 450kL of rainwater storage,

5.3 Water Quality

Gross pollutant traps have been proposed to reduce the contamination impact on the detention/bio-retention basin.

The remaining pollutants and treatment criteria are met by the bio-retention basin, as detailed in the AT&L report referred to in section 1.2 of this report.

5.4 Sedimentation and Erosion Control

Details of sedimentation and erosion control measures for the construction phase have been outlined, to ensure impact on the environment is minimised.

6 APPENDIX A – DRAINS INPUTS AND RESULTS

Note: Drainage series ‘G’ discharges into the sub-division stormwater infrastructure in the street, as such, an analysis of the sub-division model has been carried out, with the additional water inflow from the above included. Results included below.

ILSAX CALCULATION SUMMARY SHEET

DRAINS results prepared from Version 2016.14

Total Catchment (12.8 impervious + 15.7 pervious = 28.5 total ha)

Soil Type User to enter **AMC** User to enter

MINOR STORMS:

No.	Storm	Rainfall Volume (m^3)	Runoff Volume (m^3)	Impervious Runoff Vol. (m^3)	Pervious Runoff Vol. (m^3)
1	AR&R 20 yea	3968.64	966.66 (49.6%	659.37 (92.8%	307.29 (14.1%)
2	AR&R 20 yea	6036.14	625.10 (60.1%	590.77 (95.3%	034.33 (31.2%)
3	AR&R 20 yea	8783.29	960.72 (67.9%	828.36 (96.8%	132.36 (44.2%)
4	AR&R 20 yea	10679.45	498.05 (70.2%	682.56 (97.3%	815.49 (48.0%)
5	AR&R 20 yea	14458.45	)525.88 (72.8%	384.86 (98.0%	141.02 (52.1%)
6	AR&R 20 yea	18992.44	3937.04 (73.4%	427.57 (98.5%	509.47 (52.8%)
7	AR&R 20 yea	22157.13	5316.58 (73.6%	853.06 (98.7%	463.52 (53.1%)
8	AR&R 20 yea	28745.31	)684.46 (72.0%	821.78 (99.0%	862.68 (49.8%)

MAJOR STORMS:

No.	Storm	Rainfall Volume (m^3)	Runoff Volume (m^3)	Impervious Runoff Vol. (m^3)	Pervious Runoff Vol. (m^3)
1	AR&R 100 ye	5180.62	107.86 (60.0%	205.37 (94.5%	902.49 (31.7%)
2	AR&R 100 ye	7889.75	500.89 (69.7%	425.85 (96.4%	075.04 (47.9%)
3	AR&R 100 ye	11406.87	588.95 (75.3%	010.28 (97.5%	578.67 (57.1%)
4	AR&R 100 ye	13873.61	)643.88 (76.7%	121.59 (97.9%	522.29 (59.3%)
5	AR&R 100 ye	18792.58	4777.47 (78.6%	337.52 (98.5%	439.95 (62.4%)
6	AR&R 100 ye	24695.88	9558.93 (79.2%	997.29 (98.8%	561.64 (63.1%)
7	AR&R 100 ye	28745.32	2745.55 (79.1%	821.61 (99.0%	923.94 (62.8%)
8	AR&R 100 ye	38878.89	)225.81 (77.7%	385.82 (99.3%	839.99 (60.1%)

LOCATION AND LAND-USE | **TIME AND RUNOFF** | **INLET DESIGN** | **PIPE SYSTEM DESIGN** | **PIT RESULTS**

1 Design ARI	2 Pit Name	3 Sub-Catchment Area	4 Land-Use	5 Percent-age	6 Constant Flow Time (minutes)	7 Length (m)	8 Kinematic Wave Parameters Slope (%)	9 Roughness n	10 Total Time tc (minutes)	11 Peak Sub-Catchment Flowrate (m^3/s) *worst storm	12 Origin of Approach Flows	13 Overflows Approaching Pit Flowrate (m^3/s)	14 Flow Width (m)	15 Depth x Velocity (m^2/s)	16 Inlet Family	17 Inlet Size	18 Total Approach Flow (m^3/s)	19 Overflow Leaving Pit Bypass Flow (m^3/s)	20 Flow Width (m)	21 Depth x Velocity (m^2/s)	22 Peak Flow in Pipe (m^3/s)	23 Reach Length (m)	24 Pipe Slope (m)	25 Pipe Diameter (mm)	26 U/S Pipe Invert Level (m)	27 D/S Pipe Invert Level (m)	28 U/S HGL in Pipe (m)	29 D/S HGL in Pipe (m)	30 Pipe Flow Velocity (m/s)	31 Pressure Change Coeff. Ku	31a QUDM Chart No.	31b QUDM Chart Ratios	32 Water Surface Elevation (m)	33 Surface Level (m)	34 Free-board (m)	35 Pit Name	36 Remarks
20	Pit C1	0.0572	Paved Supp. Grassed	100 0 0	0 0 0	20 20 20	1 1 1	0.015 0.25 0.25	1.73 9.37	0.027	Pit C2	0	0	0	Acor Standard	ACOR PIT TY	0.027	0	0	0	0.025	12.5	1.04	375	67.93	67.8	68.025	67.895	1.14	5.93	A1-4	0.0, Vo2/(2gDc	68.1	68.53	0.43	Pit C1	
100	Pit C1	0.0572	Paved Grassed	< - - -	- - - -	as above	- - - -	- - - >	1.56 8.42	0.035	Pit C2	0	0	0			0.035	0	0	0	0.033						68.04	67.91	1.24	5.93	A1-4	0.0, Vo2/(2gDc	68.13	68.53	0.4	Pit C1	
20	Pit A1		Paved Supp. Grassed												Acor Standard	ACOR SPECI	0	0	0	0	3.675	13	0.54	1200	63.63	63.56	64.821	64.598	3.54	0.4	H-O'L	Qo=0.01, S/Do	64.93	68.9	3.97	Pit A1	
100	Pit A1		Paved Grassed	< - - -	- - - -	as above	- - - -	- - - >									0	0	0	0	3.84						65.902	64.617	3.64	0.4	H-O'L	Qo=0.01, S/Do	66.12	68.9	2.78	Pit A1	
20	Discharge Pit		Paved Supp. Grassed												Acor Standard	ACOR SPECI	0				4.029	14.9	1.01	1500	61.85	61.7	63.371	62.848	2.73	5.21	A1-4	0.0, Vo2/(2gDc	64.14	68.8	4.66	Discharge Pit	
100	Discharge Pit		Paved Grassed	< - - -	- - - -	as above	- - - -	- - - >									0				4.293						62.893	62.882	3.23	1.2	H-O'L	Qo=0.00, S/Do	63.28	68.8	5.52	Discharge Pit	
20	E1 Grated Dr	0.0432	Paved Supp. Grassed	75 0 25	0 0 0	19 19 19	1 1 1	0.015 0.25 0.25	1.68 9.08	0.016					Acor Standard	ACOR PIT TY	0.016	0	0	0	0.018	5	1	300	66.94	66.89	67.072	67.06	0.59	5.93	A1-4	0.0, Vo2/(2gDc	67.13	67.54	0.41	E1 Grated Drain	
100	E1 Grated Dr	0.0432	Paved Grassed	< - - -	- - - -	as above	- - - -	- - - >	1.51 8.17	0.022							0.022	0.009	1.73	0.01	0.021						67.522	67.529	0.3	4.08	A1-4	1.0, Vo2/(2gDc	67.53	67.54	0.01	E1 Grated Drain	
20	Pit D21		Paved Supp. Grassed												Acor Standard	ACOR SPECI	0	0	0	0	0.113	13	0.54	450	66.45	66.38	67.06	67.047	0.71	0	A1-25	3, Qg/Qo=0.00	67.06	67.7	0.64	Pit D21	
100	Pit D21		Paved Grassed	< - - -	- - - -	as above	- - - -	- - - >									0	0	0	0	0.137						67.527	67.528	0.86	0.18	A1-24	Qo=1.50, (Qu/C	67.53	67.7	0.17	Pit D21	
20	Pit D20	0.0518	Paved Supp. Grassed	88 0 12	0 0 0	30 30 30	2.8 2.8 2.8	0.015 0.25 0.25	1.62 8.77	0.022	Pit D21	0	0	0	Acor Standard	ACOR PIT TY	0.022	0	0	0	0.131	25.5	0.51	450	66.36	66.23	67.026	66.978	0.82	0.77	A1-5	0, Qg/Qo=0.14	67.05	67.55	0.5	Pit D20	
100	Pit D20	0.0518	Paved Grassed	< - - -	- - - -	as above	- - - -	- - - >	1.46 7.89	0.029	Pit D21	0	0	0			0.029	0	0	0	0.152						67.514	67.498	0.96	0.65	A1-5	0, Qg/Qo=0.15	67.53	67.55	0.02	Pit D20	
20	Pit D19	0.0516	Paved Supp. Grassed	88 0 12	0 0 0	30 30 30	2.8 2.8 2.8	0.015 0.25 0.25	1.62 8.77	0.022	Pit D20	0	0	0	Acor Standard	ACOR PIT TY	0.022	0	0	0	0.144	21.5	0.51	450	66.21	66.1	66.952	66.896	0.91	0.7	A1-5	0, Qg/Qo=0.12	66.98	67.55	0.57	Pit D19	
100	Pit D19	0.0516	Paved Grassed	< - - -	- - - -	as above	- - - -	- - - >	1.46 7.89	0.029	Pit D20	0	0	0			0.029	0	0	0	0.165						67.475	67.443	1.04	0.59	A1-5	0, Qg/Qo=0.14	67.5	67.55	0.05	Pit D19	
20	Pit D18	0.0574	Paved Supp. Grassed	88 0 12	0 0 0	30 30 30	2.8 2.8 2.8	0.015 0.25 0.25	1.62 8.77	0.024	Pit D19	0	0	0	Acor Standard	ACOR PIT TY	0.024	0	0	0	0.16	10	0.6	450	66.08	66.02	66.856	66.828	1.01	0.85	A1-6	0, Qg/Qo=0.12	66.9	67.55	0.65	Pit D18	
100	Pit D18	0.0574	Paved Grassed	< - - -	- - - -	as above	- - - -	- - - >	1.46 7.89	0.032	Pit D19	0	0	0			0.032	0	0	0	0.183						67.4	67.364	1.15	0.75	A1-6	0, Qg/Qo=0.14	67.44	67.55	0.11	Pit D18	
20	Pit D17		Paved Supp. Grassed												Acor Standard	ACOR PIT TY	0	0	0	0	0.156	20.5	0.49	450	66	65.9	66.814	66.755	0.98	0.3	A1-6	0, Qg/Qo=0.00	66.83	67.82	0.99	Pit D17	
100	Pit D17		Paved Grassed	< - - -	- - - -	as above	- - - -	- - - >									0	0	0	0	0.173						67.347	67.292	1.09	0.3	A1-6	0, Qg/Qo=0.00	67.36	67.82	0.46	Pit D17	
20	Pit D16		Paved Supp. Grassed								Pit D17	0	0	0	Acor Standard	ACOR PIT TY	0	0	0	0	0.157	5	0.6	450	65.88	65.85	66.664	66.649	0.99	1.92	H-O'L	Qo=0.00, S/Do	66.75	67.8	1.05	Pit D16	
100	Pit D16		Paved Grassed	< - - -	- - - -	as above	- - - -	- - - >			Pit D17	0	0	0			0	0	0	0	0.175						67.184	67.17	1.1	1.92	H-O'L	Qo=0.00, S/Do	67.29	67.8	0.51	Pit D16	
20	Pit D15	0.0342	Paved Supp. Grassed	85 0 15	0 0 0	20 20 20	2.8 2.8 2.8	0.015 0.25 0.25	1.27 6.88	0.014	Pit D16	0	0	0	Acor Standard	ACOR PIT TY	0.014	0	0	0	0.167	31.5	0.51	450	65.83	65.67	66.541	66.436	1.05	1.99	H-O'L	Qo=0.07, S/Do	66.65	67.68	1.03	Pit D15	
100	Pit D15	0.0342	Paved Grassed	< - - -	- - - -	as above	- - - -	- - - >	1.14 6.18	0.019	Pit D16	0	0	0			0.019	0	0	0	0.185						67.05	66.939	1.17	1.96	H-O'L	Qo=0.09, S/Do	67.17	67.68	0.51	Pit D15	
20	Pit D14	0.0536	Paved Supp. Grassed	88 0 12	0 0 0	30 30 30	2.8 2.8 2.8	0.015 0.25 0.25	1.62 8.77	0.023	Pit D15	0	0	0	Acor Standard	ACOR PIT TY	0.023	0	0	0	0.184	25.5	-3.41	450	64.65	65.52	66.244	66.136	1.16	2.84	A1-4	2.4, Vo2/(2gDc	66.44	67.82	1.38	Pit D14	
100	Pit D14	0.0536	Paved Grassed	< - - -	- - - -	as above	- - - -	- - - >	1.46 7.89	0.03	Pit D15	0	0	0			0.03	0	0	0	0.214						66.777	66.656	1.35	2.14	A1-4	3.9, Vo2/(2gDc	66.94	67.82	0.88	Pit D14	
20	Pit D13	0.0535	Paved Supp. Grassed	88 0 12	0 0 0	30 30 30	2.8 2.8 2.8	0.015 0.25 0.25	1.62 8.77	0.023	Pit D14	0	0	0	Acor Standard	ACOR PIT TY	0.023	0	0	0	0.202	25.5	0.51	450	65.5	65.37	66.085	65.956	1.27	0.62	A1-5	0, Qg/Qo=0.10	66.14	67.1	0.96	Pit D13	
100	Pit D13	0.0535	Paved Grassed	< - - -	- - - -	as above	- - - -	- - - >	1.46 7.89	0.03	Pit D14	0	0	0			0.03	0	0	0	0.245						66.604	66.451	1.54	0.53	A1-5	0, Qg/Qo=0.11	66.66	67.1	0.44	Pit D13	
20	Pit D12	0.0535	Paved Supp. Grassed	88 0 12	0 0 0	30 30 30	2.8 2.8 2.8	0.015 0.25 0.25	1.62 8.77	0.023	Pit D13	0	0	0	Acor Standard	ACOR PIT TY	0.023	0	0	0	0.221	37.5	0.37	450	65.35	65.21	65.898	65.678	1.39	0.59	A1-5	0, Qg/Qo=0.09	65.96	66.8	0.84	Pit D12	
100	Pit D12	0.0535	Paved Grassed	< - - -	- - - -	as above	- - - -	- - - >	1.46 7.89	0.03	Pit D13	0	0	0			0.03	0	0	0	0.275						66.391	66.114	1.73	0.5	A1-5	0, Qg/Qo=0.10	66.45	66.8	0.35	Pit D12	
20	Pit D11	0.0577	Paved Supp. Grassed	88 0 12	0 0 0	30 30 30	2.8 2.8 2.8	0.015 0.25 0.25	1.62 8.77	0.024	Pit D12	0	0	0	Acor Standard	ACOR PIT TY	0.024	0	0	0	0.242	25.5	0.51	450	65.19	65.06	65.636	65.438	1.7	0.58	A1-5	0, Qg/Qo=0.09	65.68	66.48	0.8	Pit D11	
100	Pit D11	0.0577	Paved Grassed	< - - -	- - - -	as above	- - - -	- - - >	1.46 7.89	0.032	Pit D12	0	0	0			0.032	0	0	0	0.308						66.037	65.806	1.93	0.51	A1-5	0, Qg/Qo=0.10	66.11	66.48	0.37	Pit D11	
20	Pit D10	0.0535	Paved Supp. Grassed	88 0 12	0 0 0	30 30 30	2.8 2.8 2.8	0.015 0.25 0.25	1.62 8.77	0.023	Pit D11	0	0	0	Acor Standard	ACOR PIT TY	0.023	0	0	0	0.256	13.5	0.52	525	65.04	64.97	65.435	65.388	1.46	0.03	A1-5	8, Qg/Qo=0.08	65.44	66.18	0.74	Pit D10	
100	Pit D10	0.0535	Paved Grassed	< - - -	- - - -	as above	- - - -	- - - >	1.46 7.89	0.03	Pit D11	0	0	0			0.03	0	0	0	0.34						65.804	65.74	1.57	0.02	A1-5	8, Qg/Qo=0.08	65.81	66.18	0.37	Pit D10	
20	Pit D9	0.0289	Paved Supp. Grassed	88 0 12	0 0 0	23 23 23	2.8 2.8 2.8	0.015 0.25 0.25	1.38 7.48	0.012	Pit D10	0	0	0	Acor Standard	ACOR PIT TY	0.012	0	0	0	0.266	16.5	0.73	525	64.95	64.83	65.357	65.305	1.48	0.37	A1-5	0, Qg/Qo=0.04	65.39	66	0.61	Pit D9	
100	Pit D9	0.0289	Paved Grassed	< - - -	- - - -	as above	- - - -	- - - >	1.24 6.72	0.016	Pit D10	0	0	0			0.016	0	0	0	0.35						65.701	65.615	1.62	0.36	A1-5	0, Qg/Qo=0.04	65.74	66	0.26	Pit D9	
20	Pit D8	0.0358	Paved Supp. Grassed	88 0 12	0 0 0	23 23 23	2.8 2.8 2.8	0.015 0.25 0.25	1.38 7.48	0.015	Pit D9	0	0	0	Acor Standard	ACOR PIT TY	0.015	0	0	0	0.277	25.5	1.1	525	64.81	64.53	65.267	65.186	1.39	0.43	A1-5	0, Qg/Qo=0.05	65.31	65.8	0.49	Pit D8	
100	Pit D8	0.0358	Paved Grassed	< - - -	- - - -	as above	- - - -	- - - >	1.24 6.72	0.02	Pit D9	0	0	0			0.02	0	0	0	0.362						65.568	65.424	1.67	0.41	A1-5	0, Qg/Qo=0.05	65.61	65.8	0.19	Pit D8	
20	Pit D7	0.0533	Paved Supp. Grassed	88 0 12	0 0 0	30 30 30	2.8 2.8 2.8	0.015 0.25 0.25	1.62 8.77	0.023	Pit D8	0	0	0	Acor Standard	ACOR PIT TY	0.023	0	0	0	0.306	25.5	1.1	525	64.51	64.23	65.148	65.043	1.41	0.48	A1-5	0, Qg/Qo=0.07	65.19	65.5	0.31	Pit D7	
100	Pit D7	0.0533	Paved Grassed	< - - -	- - - -	as above	- - - -	- - - >	1.46 7.89	0.03	Pit D8	0	0	0			0.03	0	0	0	0.353						65.365	65.199	1.63	0.44	A1-5	0, Qg/Qo=0.07	65.42	65.5	0.08	Pit D7	
20	Pit D6	0.0534	Paved Supp. Grassed	88 0 12	0 0 0	30 30 30	2.8 2.8 2.8	0.015 0.25 0.25	1.62 8.77	0.023	Pit D7	0	0	0	Acor Standard	ACOR PIT TY	0.023	0	0	0	0.315	25.5	0.51	525	63.76	63.63	65.003	64.889	1.45	0.45	A1-5	0, Qg/Qo=0.06	65.04	65.1	0.06	Pit D6	
100	Pit D6	0.0534	Paved Grassed	< - - -	- - - -	as above	- - - -	- - - >	1.46 7.89	0.03	Pit D7	0	0	0			0.03	0.007	4	0	0.372						65.102	64.917	1.72	0.66	A1-5	0, Qg/Qo=0.17	65.2	65.1	-0.1	Pit D6	
20	Pit D5	0.0534	Paved Supp. Grassed	88 0 12	0 0 0	30 30 30	2.8 2.8 2.8	0.015 0.25 0.25	1.62 8.77	0.023	Pit D6	0	0	0	Acor Standard	ACOR PIT TY	0.023	0	0	0	0.326	25.5	0.51	525	63.61	63.48	64.843	64.717	1.5	0.46	A1-5	0, Qg/Qo=0.06	64.89	65	0.11	Pit D5	
100	Pit D5	0.0534	Paved Grassed	< - - -	- - - -	as above	- - - -	- - - >	1.46 7.89	0.03	Pit D6	0.007	4	0			0.037	0	0	0	0.395						64.78	64.569	1.82	0.82	A1-5	0, Qg/Qo=0.23	64.92	65	0.08	Pit D5	
20	Pit D4	0.0536	Paved Supp. Grassed	88 0 12	0 0 0	30 30 30	2.8 2.8 2.8	0.015 0.25 0.25	1.62 8.77	0.023	Pit D5	0	0	0	Acor Standard	ACOR PIT TY	0.023	0	0	0	0.323	25.5	0.51	525	63.46	63.33	64.668	64.531	1.49	0.45	A1-5	0, Qg/Qo=0.06	64.72	64.85	0.13	Pit D4	
100	Pit D4	0.0536	Paved Grassed	< - - -	- - - -	as above	- - - -	- - - >	1.46 7.89	0.03	Pit D5	0	0	0			0.03	0	0	0	0.418						64.417	64.178	1.93	0.81	A1-5	0, Qg/Qo=0.23	64.57	64.85	0.28	Pit D4	
20	Pit D3	0.0536	Paved Supp. Grassed	88 0 12	0 0 0	30 30 30	2.8 1 2.8	0.015 0.25 0.25	1.62 8.77	0.023	Pit D4	0	0	0	Acor Standard	ACOR PIT TY	0.023	0	0	0	0.337	23	0.52	600	63.31	63.19	64.531	64.466	1.19	0	A1-5	7, Qg/Qo=0.06	64.53	64.75	0.22	Pit D3	
100	Pit D3	0.0536	Paved Grassed	< - - -	- - - -	as above	- - - -	- - - >	1.46 7.89	0.03	Pit D4	0	0	0			0.03	0	0	0	0.441						64.106	63.987	1.56	0.58	A1-5	7, Qg/Qo=0.22	64.18	64.75	0.57	Pit D3	
20	Pit D2	0.0486	Paved Supp. Grassed	88 0 12	0 0 0	30 30 30	2.8 3 2.8	0.015 0.25 0.25	1.62 8.77	0.021	Pit D3	0	0	0	Acor Standard	ACOR PIT TY	0.021	0	0	0	0.353	25.5	0.51	600	63.17	63.04	64.435	64.354	1.25	0.41	A1-5	0, Qg/Qo=0.05	64.47	64.6	0.13	Pit D2	
100	Pit D2	0.0486	Paved Grassed	< - - -	- - - -	as above	- - - -	- - - >	1.46 7.89	0.027	Pit D3	0	0	0			0.027	0	0	0	0.464						63.886	63.74	1.64	0.74	A1-5	0, Qg/Qo=0.18	63.99	64.6	0.61	Pit D2	
20	Pit D1	0.0543	Paved Supp. Grassed	88 0 12	0 0 0	30 30 30	2.8 1 2.8	0.015 0.25 0.25	1.62 8.77	0.023	Pit D2	0	0	0	Acor Standard	ACOR PIT TY	0.023	0	0	0	0.371	25	0.52	600	63.02	62.89	64.226	64.145	1.31	1.56	A1-14	0, Qg/Qo=0.05	64.35	64.47	0.12	Pit D1	
100	Pit D1	0.0543	Paved Grassed	< - - -	- - - -	as above	- - - -	- - - >	1.46 7.89	0.03	Pit D2	0	0	0			0.03	0	0	0	0.489						63.618	63.348	2.11	1.49	A1-14	0, Qg/Qo=0.20	63.74	64.47	0.73	Pit D1	
20	Pit A24	0.2589	Paved Supp. Grassed	100 0 0	0 0 0	60 60 60	1.1 1.1 1.1	0.015 0.25 0.25	3.25 17.6	0.12					Acor Standard	ACOR PIT TY	0.12	0	0	0	0.149	37	0.51	600	67.7	67.51	68.285	68.296	0.53	5.63	A1-4	0.1, Vo2/(2gDc	68.62	68.65	0.03	Pit A24	
100	Pit A24	0.2589	Paved Grassed	< - - -	- - - -	as above	- - - -	- - - >	2.92 15.82	0.157							0.15700001	0.264	4	0.08	0.134						68.8	68.8	0.47	4.23	A1-4	0.9, Vo2/(2gDc	68.8	68.65	-0.15	Pit A24	
20	Pit A23	0.1953	Paved Supp. Grassed	100 0 0	0 0 0	36 36 36	1 1 1	0.015 0.25 0.25	2.46 13.33	0.091	Pit A24	0	0	0	Acor Standard	ACOR PIT TY	0.091	0	0	0	0.277	29.5	0.51	750	67.49	67.34	68.244	68.271	0.63	1.78	A1-20	0, Qg/Qo=0.27	68.3	68.65	0.35	Pit A23	
100	Pit A23	0.1953	Paved Grassed	< - - -	- - - -	as above	- - - -	- - - >	2.22 11.98	0.118	Pit A24	0.264	4	0.08			0.382	0.356	4	0.1	0.303						68.8	68.782	0.69	1.99	A1-20	0, Qg/Qo=0.34	68.8	68.65	-0.15	Pit A23	
20	Pit A22	0.1953	Paved Supp. Grassed	100 0 0	0 0 0	36 36 36	1 1 1	0.015 0.25 0.25	2.46 13.33	0.091	Pit A23	0	0	0	Acor Standard	ACOR PIT TY	0.091	0	0	0	0.389	29.5	0.51	900	67.32	67.17	68.234	68.251	0.61	0.63	A1-5	3, Qg/Qo=0.21	68.27	68.65	0.38	Pit A22	
100	Pit A22	0.1953	Paved Grassed	< - - -	- - - -	as above	- - - -	- - - >	2.22 11.98	0.118	Pit A23	0.356	4	0.1			0.47400001	0.44	4	0.13	0.462						68.781	68.783	0.73	0.99	A1-5	3, Qg/Qo=0.30	68.78	68.65	-0.13	Pit A22	
20	Pit A21	0.1953	Paved Supp. Grassed	100 0 0	0 0 0	36 36 36	1 1 1	0.015 0.25 0.25	2.46 13.33	0.091	Pit A22	0	0	0	Acor Standard	ACOR PIT TY	0.091	0	0	0	0.518	29.5	0.51	900	67.15	67	68.228	68.206	0.81	1.18	A1-20	0, Qg/Qo=0.13	68.25	68.65	0.4	Pit A21	
100	Pit A21	0.1953	Paved Grassed	< - - -	- - - -	as above	- - - -	- - - >	2.22 11.98	0.118	Pit A22	0.44	4	0.13			0.55800003	0.519	4	0.15	0.636						68.778	68.778	1	1.31	A1-20	0, Qg/Qo=0.18	68.78	68.65	-0.13	Pit A21	
20	Pit A20	0.1953	Paved Supp. Grassed	100 0 0	0 0 0	36 36 36	1 1 1	0.015 0.25 0.25	2.46 13.33	0.091	Pit A21	0	0	0	Acor Standard	ACOR PIT TY	0.091	0	0	0	0.646	29.5	0.51	900	66.98	66.83	68.178	68.165	1.01	0.94	A1-20	0, Qg/Qo=0.10	68.21	68.65	0.44	Pit A20	
100	Pit A20	0.1953	Paved Grassed	< - - -	- - - -	as above	- - - -	- - - >	2.22 11.98	0.118	Pit A21	0.519	4	0.15			0.63700002	0.594	4	0.17	0.75						68.77	68.768	1.18	1.07	A1-20	0, Qg/Qo=0.14	68.78	68.65	-0.13	Pit A20	
20	Pit A19	0.1953	Paved Supp. Grassed	100 0 0	0 0 0	36 36 36	1 1 1	0.015 0.25 0.25	2.46 13.33	0.091	Pit A20	0	0	0	Acor Standard	ACOR PIT TY	0.091	0	0	0	0.74	29.5	0.51	900	66.81	66.66	68.142	68.107	1.16	0.59	A1-5	0, Qg/Qo=0.10	68.17	68.65	0.48	Pit A19	
100	Pit A19	0.1953	Paved Grassed	< - - -	- - - -	as above	- - - -	- - - >	2.22 11.98	0.118	Pit A20	0.594	4	0.17			0.71200001	0.661	4	0.18	0.842						68.763	68.761	1.32	0.67	A1-5	0, Qg/Qo=0.14	68.77	68.65	-0.12	Pit A19	
20	Pit A18	0.1988	Paved Supp. Grassed	100 0 0	0 0 0	36 36 36	1 1 1	0.015 0.25 0.25	2.46 13.33	0.092	Pit A19	0	0	0	Acor Standard	ACOR PIT TY	0.092	0	0	0	0.826	29.5	0.51	900	66.64	66.49	68.066	68.029	1.3	0.76	A1-20	0, Qg/Qo=0.08	68.11	68.65	0.54	Pit A18	
100	Pit A18	0.1988	Paved Grassed	< - - -	- - - -	as above	- - - -	- - - >	2.22 11.98	0.12	Pit A19	0.661	4	0.18			0.78100002	0.72	4	0.2	0.931						68.747	68.743	1.46	0.86	A1-20	0, Qg/Qo=0.12	68.76	68.65	-0.11	Pit A18	
20	Pit A17	0.2225	Paved Supp. Grassed	100 0 0	0 0 0	36 36 36	1 1 1	0.015 0.25 0.25	2.46 13.33	0.103	Pit A18	0	0	0	Acor Standard	ACOR PIT TY	0.103	0	0	0	0.91	29.5	0.51	900	66.47	66.32	67.977	67.921	1.43	0.7	A1-20	0, Qg/Qo=0.08	68.03	68.65	0.62	Pit A17	
100	Pit A17	0.2225	Paved Grassed	< - - -	- - - -	as above	- - - -	- - - >	2.22 11.98	0.135	Pit A18	0.72	4	0.2			0.85500002	0.773	4	0.21	1.041						68.724	68.715	1.64	0.8	A1-20	0, Qg/Qo=0.11	68.74	68.65	-0.09	Pit A17	
20	Pit A16	0.2225	Paved Supp. Grassed	100 0 0	0 0 0	36 36 36	1 1 1	0.015 0.25 0.25	2.46 13.33	0.103	Pit A17	0	0	0	Acor Standard	ACOR PIT TY	0.103	0	0	0	0.999	29.5	0.51	1050	66.3	66.15	67.921	67.893	1.11	0	A1-5	4, Qg/Qo=0.08	67.92	68.65	0.73	Pit A16	
100	Pit A16	0.2225	Paved Grassed	< - - -	- - - -	as above	- - - -	- - - >	2.22 11.98	0.135	Pit A17	0.773	4	0.21			0.90799999	0.794	4	0.22	1.127						68.715	68.712	1.25	0.04	A1-5	4, Qg/Qo=0.11	68.72	68.65	-0.07	Pit A16	
20	Pit A15	0.2225	Paved Supp. Grassed	100 0 0	0 0 0	36 36 36	1 1 1	0.015 0.25 0.25	2.46 13.33	0.103	Pit A16	0	0	0	Acor Standard	ACOR PIT TY	0.103	0	0	0	1.089	29.5	0.51	1050	66.13	65.98	67.857	67.827	1.21	0.63	A1-20	0, Qg/Qo=0.07	67.89	68.65	0.76	Pit A15	
100	Pit A15	0.2225	Paved Grassed	< - - -	- - - -	as above	- - - -	- - - >	2.22 11.98	0.135	Pit A16	0.794	4	0.22			0.92900002	0.802	4	0.22	1.242						68.695	68.688	1.38	0.71	A1-20	0, Qg/Qo=0.09	68.71	68.65	-0.06	Pit A15	
20	Pit A14	0.2225	Paved Supp. Grassed	100 0 0	0 0 0	36 36 36	1 1 1	0.015 0.25 0.25	2.46 13.33	0.103	Pit A15	0	0	0	Acor Standard	ACOR PIT TY	0.103	0	0	0	1.153	29.5	0.51	1050	65.96	65.81	67.784	67.745	1.28	0.59	A1-20	0, Qg/Qo=0.06	67.83	68.65	0.82	Pit A14	
100	Pit A14	0.2225	Paved Grassed	< - - -	- - - -	as above	- - - -	- - - >	2.22 11.98	0.135	Pit A15	0.802	4	0.22			0.93699998	0.777	4	0.21	1.323						68.665	68.652	1.47	0.67	A1-20	0, Qg/Qo=0.09	68.69	68.65	-0.04	Pit A14	
20	Pit A13	0.2225	Paved Supp. Grassed	100 0 0	0 0 0	36 36 36	1 1 1	0.015 0.25 0.25	2.46 13.33	0.103	Pit A14	0	0	0	Acor Standard	ACOR PIT TY	0.103	0	0	0	1.23	29.5	0.51	1050	65.79	65.64	67.71	67.669	1.37	0.43	A1-5	0, Qg/Qo=0.06	67.75	68.65	0.9	Pit A13	
100	Pit A13	0.2225	Paved Grassed	< - - -	- - - -	as above	- - - -	- - - >	2.22 11.98	0.135	Pit A14	0.777	4	0.21			0.912	0.736	4	0.2	1.427						68.63	68.614	1.59	0.47	A1-5	0, Qg/Qo=0.09	68.65	68.65	0	Pit A13	
20	Pit A12	0.2233	Paved Supp. Grassed	100 0 0	0 0 0	36 36 36	1 1 1	0.015 0.25 0.25	2.46 13.33	0.104	Pit A13	0	0	0	Acor Standard	ACOR PIT TY	0.104	0	0	0	1.319	29.5	0.51	1050	65.62	65.47	67.611	67.554	1.47	0.58	A1-20	0, Qg/Qo=0.06	67.67	68.65	0.98	Pit A12	
100	Pit A12	0.2233	Paved Grassed	< - - -	- - - -	as above	- - - -	- - - >	2.22 11.98	0.135	Pit A13	0.736	4	0.2			0.87099999	0.691	4	0.19	1.54						68.571	68.539	1.71	0.65	A1-20	0, Qg/Qo=0.08	68.61	68.65	0.04	Pit A12	
20	Pit A11	0.1718	Paved Supp. Grassed	100 0 0	0 0 0	36 36 36	1 1 1	0.015 0.25 0.25	2.46 13.33	0.08	Pit A12	0	0	0	Acor Standard	ACOR PIT TY	0.08	0	0	0	1.402	29.5	0.51	900	65.45	65.3	67.322	67.152	2.2	0.99	A1-25	9, Qg/Qo=0.04	67.55	68.65	1.1	Pit A11	
100	Pit A11	0.1718	Paved Grassed	< - - -	- - - -	as above	- - - -	- - - >	2.22 11.98	0.104	Pit A12	0.691	4	0.19			0.79500002	0.62	4	0.17	1.712						68.351	68.243	2.69	1.06	A1-20	9, Qg/Qo=0.07	68.54	68.65	0.11	Pit A11	
20	Pit A10	0.172	Paved Supp. Grassed	100 0 0	0 0 0	36 36 36	1 1 1	0.015 0.25 0.25	2.46 13.33	0.08	Pit A11	0	0	0	Acor Standard	ACOR PIT TY	0.08	0	0	0	1.43	29.5	0.51	1050	65.28	65.13	67.152	67.091	1.59	0	A1-5	4, Qg/Qo=0.04	67.15	68.65	1.5	Pit A10	
100	Pit A10	0.172	Paved Grassed	< - - -	- - - -	as above	- - - -	- - - >	2.22 11.98	0.104	Pit A11	0.62	4	0.17			0.72399998	0.543	4	0.15	1.797						68.243	68.19	2	0	A1-5	4, Qg/Qo=0.07	68.24	68.65	0.41	Pit A10	
20	Pit A9	0.172	Paved Supp. Grassed	100 0 0	0 0 0	36 36 36	1 1 1	0.015 0.25 0.25	2.46 13.33	0.08	Pit A10	0	0	0	Acor Standard	ACOR PIT TY	0.08	0	0	0	1.527	29.5	0.51	1050	65.11	64.96	67.019	66.926	1.7	0.53	A1-25	0, Qg/Qo=0.04	67.09	68.65	1.56	Pit A9	

100	Pit A9	0.172	Paved Grassed	< - - -	- - - -	as above	- - - -	- - - >	2.22 11.98	0.104	Pit A10	0.543	4	0.15			0.64700001	0.426	4	0.12	1.954						68.118	68.057	2.17	0.56	A1-20	0, Qg/Qo=0.06	68.19	68.65	0.46	Pit A9
20	Pit A8	0.172	Paved Supp. Grassed	100 0 0	0 0 0	36 36 36	1 1 1	0.015 0.25 0.25	2.46 13.33	0.08	Pit A9	0	0	0	Acor Standarc	ACOR PIT TY	0.08	0	0	0	1.628	29.5	0.51	1050	64.94	64.79	66.842	66.755	1.81	0.53	A1-25	0, Qg/Qo=0.04	66.93	68.65	1.72	Pit A8
100	Pit A8	0.172	Paved Grassed	< - - -	- - - -	as above	- - - -	- - - >	2.22 11.98	0.104	Pit A9	0.426	4	0.12			0.53000003	0.259	4	0.08	2.011						67.977	67.901	2.24	0.53	A1-20	0, Qg/Qo=0.06	68.06	68.65	0.59	Pit A8
20	Pit A7	0.146	Paved Supp. Grassed	100 0 0	0 0 0	36 36 36	1 1 1	0.015 0.25 0.25	2.46 13.33	0.068	Pit A8	0	0	0	Acor Standarc	ACOR PIT TY	0.068	0	0	0	1.671	17.5	0.51	1200	64.77	64.68	66.736	66.706	1.48	0.17	H-O'L	Qo=0.03, S/Do	66.75	68.65	1.9	Pit A7
100	Pit A7	0.146	Paved Grassed	< - - -	- - - -	as above	- - - -	- - - >	2.22 11.98	0.088	Pit A8	0.259	4	0.08			0.347	0	0	0	1.942						67.881	67.857	1.72	0.19	H-O'L	Qo=0.04, S/Do	67.9	68.65	0.75	Pit A7
20	Pit A6	0.0339	Paved Supp. Grassed	100 0 0	0 0 0	25 25 25	1 1 1	0.015 0.25 0.25	1.98 10.71	0.016	Pit A7	0	0	0	Acor Standarc	ACOR PIT TY	0.016	0	0	0	1.683	29.5	0.51	1200	64.66	64.51	66.546	66.488	1.49	1.46	A1-14	0, Qg/Qo=0.01	66.71	68.65	1.94	Pit A6
100	Pit A6	0.0339	Paved Grassed	< - - -	- - - -	as above	- - - -	- - - >	1.78 9.63	0.021	Pit A7	0	0	0			0.021	0	0	0	1.864						67.728	67.681	1.65	1.2	A1-14	0, Qg/Qo=0.01	67.86	68.65	0.79	Pit A6
20	Pit A5	0.0736	Paved Supp. Grassed	100 0 0	0 0 0	22 22 22	1 1 1	0.015 0.25 0.25	1.83 9.92	0.034	Pit A6	0	0	0	Acor Standarc	ACOR PIT TY	0.034	0	0	0	1.705	29.5	0.51	1200	64.49	64.34	66.459	66.405	1.51	0.26	A1-5	0, Qg/Qo=0.02	66.49	68.65	2.16	Pit A5
100	Pit A5	0.0736	Paved Grassed	< - - -	- - - -	as above	- - - -	- - - >	1.65 8.92	0.045	Pit A6	0	0	0			0.045	0	0	0	1.885						67.652	67.603	1.67	0.26	A1-5	0, Qg/Qo=0.02	67.68	68.65	0.97	Pit A5
20	Pit A4	0.0709	Paved Supp. Grassed	100 0 0	0 0 0	22 22 22	1 1 1	0.015 0.25 0.25	1.83 9.92	0.033	Pit A5	0	0	0	Acor Standarc	ACOR PIT TY	0.033	0	0	0	1.729	29.5	0.51	1200	64.32	64.17	66.375	66.317	1.53	0.26	A1-5	0, Qg/Qo=0.01	66.41	68.65	2.24	Pit A4
100	Pit A4	0.0709	Paved Grassed	< - - -	- - - -	as above	- - - -	- - - >	1.65 8.92	0.043	Pit A5	0	0	0			0.043	0	0	0	1.894						67.574	67.519	1.68	0.25	A1-5	0, Qg/Qo=0.02	67.6	68.65	1.05	Pit A4
20	Pit A3	0.0532	Paved Supp. Grassed	100 0 0	0 0 0	22 22 22	1 1 1	0.015 0.25 0.25	1.83 9.92	0.025	Pit A4	0	0	0	Acor Standarc	ACOR PIT TY	0.025	0	0	0	1.746	29.5	0.51	1200	64.15	64	66.288	66.228	1.54	0.24	A1-5	0, Qg/Qo=0.01	66.32	68.65	2.33	Pit A3
100	Pit A3	0.0532	Paved Grassed	< - - -	- - - -	as above	- - - -	- - - >	1.65 8.92	0.032	Pit A4	0	0	0			0.032	0	0	0	1.907						67.49	67.435	1.69	0.24	A1-5	0, Qg/Qo=0.01	67.52	68.65	1.13	Pit A3
20	Pit A2	0.055	Paved Supp. Grassed	100 0 0	0 0 0	36 36 36	1 1 1	0.015 0.25 0.25	2.46 13.33	0.026	Pit A3	0	0	0	Acor Standarc	ACOR PIT TY	0.026	0	0	0	1.764	10	1.5	1200	63.98	63.83	66.199	66.18	1.56	0.24	A1-5	0, Qg/Qo=0.01	66.23	68.65	2.42	Pit A2
100	Pit A2	0.055	Paved Grassed	< - - -	- - - -	as above	- - - -	- - - >	2.22 11.98	0.033	Pit A3	0	0	0			0.033	0	0	0	1.925						67.405	67.387	1.7	0.24	A1-5	0, Qg/Qo=0.01	67.43	68.65	1.22	Pit A2
20	Pit B0		Paved Supp. Grassed												Acor Standarc	ACOR SPECI	0	0	0	0	3.646	32.5	0.49	1200	63.81	63.65	65.216	64.932	3.22	1.82	H-O'L	Qo=0.00, S/Do	66.18	69.06	2.88	Pit B0
100	Pit B0		Paved Grassed	< - - -	- - - -	as above	- - - -	- - - >									0	0	0	0	3.833						66.388	66.12	3.39	1.87	H-O'L	Qo=0.00, S/Do	67.39	69.06	1.67	Pit B0
20	Pit B18	0.2837	Paved Supp. Grassed	100 0 0	0 0 0	70 70 70	1 1 1	0.015 0.25 0.25	3.67 19.87	0.132					Acor Standarc	ACOR PIT TY	0.132	0	0	0	0.126	37	0.51	600	67.7	67.51	68.209	68.171	0.49	5.72	A1-4	0.1, Vo2/(2gDc	68.31	68.65	0.34	Pit B18
100	Pit B18	0.2837	Paved Grassed	< - - -	- - - -	as above	- - - -	- - - >	3.3 17.86	0.172							0.17200001	0.162	4	0.05	0.131						68.8	68.748	0.46	4.37	A1-4	0.8, Vo2/(2gDc	68.8	68.65	-0.15	Pit B18
20	Pit B17	0.2283	Paved Supp. Grassed	100 0 0	0 0 0	38 38 38	1 1 1	0.015 0.25 0.25	2.55 13.77	0.106	Pit B18	0	0	0	Acor Standarc	ACOR PIT TY	0.106	0	0	0	0.262	29.5	0.51	750	67.49	67.34	68.136	68.135	0.65	2.2	H-O'L	Qo=0.30, S/Do	68.17	68.65	0.48	Pit B17
100	Pit B17	0.2283	Paved Grassed	< - - -	- - - -	as above	- - - -	- - - >	2.29 12.38	0.138	Pit B18	0.162	4	0.05			0.29999998	0.226	4	0.07	0.306						68.74	68.737	0.69	2.25	H-O'L	Qo=0.31, S/Do	68.75	68.65	-0.1	Pit B17
20	Pit B16	0.183	Paved Supp. Grassed	100 0 0	0 0 0	38 38 38	1 1 1	0.015 0.25 0.25	2.55 13.77	0.085	Pit B17	0	0	0	Acor Standarc	ACOR PIT TY	0.085	0	0	0	0.383	29.5	0.51	900	67.32	67.17	68.127	68.117	0.64	0.67	A1-20	3, Qg/Qo=0.18	68.13	68.65	0.52	Pit B16
100	Pit B16	0.183	Paved Grassed	< - - -	- - - -	as above	- - - -	- - - >	2.29 12.38	0.111	Pit B17	0.226	4	0.07			0.33700001	0.226	4	0.07	0.418						68.735	68.735	0.66	1.23	A1-20	3, Qg/Qo=0.23	68.74	68.65	-0.09	Pit B16
20	Pit B15	0.183	Paved Supp. Grassed	100 0 0	0 0 0	38 38 38	1 1 1	0.015 0.25 0.25	2.55 13.77	0.085	Pit B16	0	0	0	Acor Standarc	ACOR PIT TY	0.085	0	0	0	0.546	29.5	0.51	900	67.15	67	68.083	68.066	0.86	1.47	H-O'L	Qo=0.12, S/Do	68.12	68.65	0.53	Pit B15
100	Pit B15	0.183	Paved Grassed	< - - -	- - - -	as above	- - - -	- - - >	2.29 12.38	0.111	Pit B16	0.226	4	0.07			0.33700001	0.258	4	0.08	0.62						68.729	68.728	0.97	1.8	H-O'L	Qo=0.15, S/Do	68.73	68.65	-0.08	Pit B15
20	Pit B14	0.183	Paved Supp. Grassed	100 0 0	0 0 0	38 38 38	1 1 1	0.015 0.25 0.25	2.55 13.77	0.085	Pit B15	0	0	0	Acor Standarc	ACOR PIT TY	0.085	0	0	0	0.684	29.5	0.51	900	66.98	66.83	68.019	67.99	1.08	1.24	H-O'L	Qo=0.09, S/Do	68.07	68.65	0.58	Pit B14
100	Pit B14	0.183	Paved Grassed	< - - -	- - - -	as above	- - - -	- - - >	2.29 12.38	0.111	Pit B15	0.258	4	0.08			0.36899999	0.284	4	0.08	0.757						68.719	68.717	1.19	1.47	H-O'L	Qo=0.13, S/Do	68.73	68.65	-0.08	Pit B14
20	Pit B13	0.1615	Paved Supp. Grassed	100 0 0	0 0 0	38 38 38	1 1 1	0.015 0.25 0.25	2.55 13.77	0.075	Pit B14	0	0	0	Acor Standarc	ACOR PIT TY	0.075	0	0	0	0.795	29.5	0.51	900	66.81	66.66	67.961	67.925	1.25	0.59	A1-20	0, Qg/Qo=0.07	67.99	68.65	0.66	Pit B13
100	Pit B13	0.1615	Paved Grassed	< - - -	- - - -	as above	- - - -	- - - >	2.29 12.38	0.098	Pit B14	0.284	4	0.08			0.382	0.293	4	0.09	0.873						68.71	68.708	1.37	0.88	A1-20	0, Qg/Qo=0.12	68.72	68.65	-0.07	Pit B13
20	Pit B12	0.1284	Paved Supp. Grassed	100 0 0	0 0 0	38 38 38	1 1 1	0.015 0.25 0.25	2.55 13.77	0.06	Pit B13	0	0	0	Acor Standarc	ACOR PIT TY	0.06	0	0	0	0.882	29.5	0.51	900	66.64	66.49	67.874	67.831	1.39	0.81	H-O'L	Qo=0.05, S/Do	67.93	68.65	0.72	Pit B12
100	Pit B12	0.1284	Paved Grassed	< - - -	- - - -	as above	- - - -	- - - >	2.29 12.38	0.078	Pit B13	0.293	4	0.09			0.37099999	0.277	4	0.08	1.009						68.694	68.69	1.59	1.1	H-O'L	Qo=0.11, S/Do	68.71	68.65	-0.06	Pit B12
20	Pit B11	0.1757	Paved Supp. Grassed	100 0 0	0 0 0	38 38 38	1 1 1	0.015 0.25 0.25	2.55 13.77	0.082	Pit B12	0	0	0	Acor Standarc	ACOR PIT TY	0.082	0	0	0	0.969	29.5	0.51	900	66.47	66.32	67.758	67.696	1.52	0.85	H-O'L	Qo=0.06, S/Do	67.83	68.65	0.82	Pit B11
100	Pit B11	0.1757	Paved Grassed	< - - -	- - - -	as above	- - - -	- - - >	2.29 12.38	0.106	Pit B12	0.277	4	0.08			0.38299999	0.255	4	0.08	1.148						68.666	68.662	1.8	1.03	H-O'L	Qo=0.09, S/Do	68.69	68.65	-0.04	Pit B11
20	Pit B10	0.1833	Paved Supp. Grassed	100 0 0	0 0 0	38 38 38	1 1 1	0.015 0.25 0.25	2.55 13.77	0.085	Pit B11	0	0	0	Acor Standarc	ACOR PIT TY	0.085	0	0	0	1.064	29.5	0.51	1050	66.3	66.15	67.683	67.654	1.18	0.24	H-O'L	Qo=0.06, S/Do	67.7	68.65	0.95	Pit B10
100	Pit B10	0.1833	Paved Grassed	< - - -	- - - -	as above	- - - -	- - - >	2.29 12.38	0.111	Pit B11	0.255	4	0.08			0.366	0.193	4	0.06	1.254						68.652	68.655	1.4	0.49	H-O'L	Qo=0.08, S/Do	68.66	68.65	-0.01	Pit B10
20	Pit B9	0.1833	Paved Supp. Grassed	100 0 0	0 0 0	38 38 38	1 1 1	0.015 0.25 0.25	2.55 13.77	0.085	Pit B10	0	0	0	Acor Standarc	ACOR PIT TY	0.085	0	0	0	1.163	29.5	0.51	1050	66.13	65.98	67.605	67.566	1.29	0.83	H-O'L	Qo=0.05, S/Do	67.65	68.65	1	Pit B9
100	Pit B9	0.1833	Paved Grassed	< - - -	- - - -	as above	- - - -	- - - >	2.29 12.38	0.111	Pit B10	0.193	4	0.06			0.30399999	0.128	4	0.04	1.317						68.623	68.614	1.46	0.99	H-O'L	Qo=0.08, S/Do	68.65	68.65	0	Pit B9
20	Pit B8	0.1833	Paved Supp. Grassed	100 0 0	0 0 0	38 38 38	1 1 1	0.015 0.25 0.25	2.55 13.77	0.085	Pit B9	0	0	0	Acor Standarc	ACOR PIT TY	0.085	0	0	0	1.255	29.5	0.51	1050	65.96	65.81	67.506	67.465	1.4	0.79	H-O'L	Qo=0.05, S/Do	67.57	68.65	1.08	Pit B8
100	Pit B8	0.1833	Paved Grassed	< - - -	- - - -	as above	- - - -	- - - >	2.29 12.38	0.111	Pit B9	0.128	4	0.04			0.23900001	0	0	0	1.395						68.567	68.547	1.55	0.96	H-O'L	Qo=0.07, S/Do	68.61	68.65	0.04	Pit B8
20	Pit B7	0.1833	Paved Supp. Grassed	100 0 0	0 0 0	38 38 38	1 1 1	0.015 0.25 0.25	2.55 13.77	0.085	Pit B8	0	0	0	Acor Standarc	ACOR PIT TY	0.085	0	0	0	1.327	29.5	0.51	1050	65.79	65.64	67.418	67.357	1.48	0.54	A1-25	0, Qg/Qo=0.05	67.47	68.65	1.18	Pit B7
100	Pit B7	0.1833	Paved Grassed	< - - -	- - - -	as above	- - - -	- - - >	2.29 12.38	0.111	Pit B8	0	0	0			0.111	0	0	0	1.47						68.51	68.483	1.64	0.59	A1-20	0, Qg/Qo=0.07	68.55	68.65	0.1	Pit B7
20	Pit B6	0.1833	Paved Supp. Grassed	100 0 0	0 0 0	38 38 38	1 1 1	0.015 0.25 0.25	2.55 13.77	0.085	Pit B7	0	0	0	Acor Standarc	ACOR PIT TY	0.085	0	0	0	1.406	29.5	0.51	1050	65.62	65.47	67.274	67.206	1.56	0.76	H-O'L	Qo=0.04, S/Do	67.36	68.65	1.29	Pit B6
100	Pit B6	0.1833	Paved Grassed	< - - -	- - - -	as above	- - - -	- - - >	2.29 12.38	0.111	Pit B7	0	0	0			0.111	0	0	0	1.569						68.409	68.372	1.74	0.84	H-O'L	Qo=0.05, S/Do	68.48	68.65	0.17	Pit B6
20	Pit B5	0.1833	Paved Supp. Grassed	100 0 0	0 0 0	38 38 38	1 1 1	0.015 0.25 0.25	2.55 13.77	0.085	Pit B6	0	0	0	Acor Standarc	ACOR PIT TY	0.085	0	0	0	1.554	29.5	0.51	1050	65.45	65.3	67.105	67.03	1.73	0.75	H-O'L	Qo=0.04, S/Do	67.21	68.65	1.44	Pit B5
100	Pit B5	0.1833	Paved Grassed	< - - -	- - - -	as above	- - - -	- - - >	2.29 12.38	0.111	Pit B6	0	0	0			0.111	0	0	0	1.737						68.272	68.205	1.93	0.82	H-O'L	Qo=0.05, S/Do	68.37	68.65	0.28	Pit B5
20	Pit B4	0.1833	Paved Supp. Grassed	100 0 0	0 0 0	38 38 38	1 1 1	0.015 0.25 0.25	2.55 13.77	0.085	Pit B5	0	0	0	Acor Standarc	ACOR PIT TY	0.085	0	0	0	1.639	29.5	0.51	1050	65.28	65.13	66.949	66.862	1.82	0.53	A1-25	0, Qg/Qo=0.04	67.03	68.65	1.62	Pit B4
100	Pit B4	0.1833	Paved Grassed	< - - -	- - - -	as above	- - - -	- - - >	2.29 12.38	0.111	Pit B5	0	0	0			0.111	0	0	0	1.88						68.13	68.046	2.09	0.51	A1-25	0, Qg/Qo=0.04	68.2	68.65	0.45	Pit B4
20	Pit B3	0.1833	Paved Supp. Grassed	100 0 0	0 0 0	38 38 38	1 1 1	0.015 0.25 0.25	2.55 13.77	0.085	Pit B4	0	0	0	Acor Standarc	ACOR PIT TY	0.085	0	0	0	1.801	29.5	0.51	1050	65.11	64.96	66.736	66.633	2	0.69	H-O'L	Qo=0.04, S/Do	66.86	68.65	1.79	Pit B3
100	Pit B3	0.1833	Paved Grassed	< - - -	- - - -	as above	- - - -	- - - >	2.29 12.38	0.111	Pit B4	0	0	0			0.111	0	0	0	2.089						67.915	67.832	2.32	0.76	H-O'L	Qo=0.04, S/Do	68.05	68.65	0.6	Pit B3
20	Pit B2	0.1833	Paved Supp. Grassed	100 0 0	0 0 0	38 38 38	1 1 1	0.015 0.25 0.25	2.55 13.77	0.085	Pit B3	0	0	0	Acor Standarc	ACOR PIT TY	0.085	0	0	0	1.912	29.5	0.51	1050	64.94	64.79	66.486	66.36	2.13	0.68	H-O'L	Qo=0.07, S/Do	66.63	68.65	2.02	Pit B2
100	Pit B2	0.1833	Paved Grassed	< - - -	- - - -	as above	- - - -	- - - >	2.29 12.38	0.111	Pit B3	0	0	0			0.111	0	0	0	2.267						67.683	67.562	2.52	0.69	H-O'L	Qo=0.08, S/Do	67.83	68.65	0.82	Pit B2
20	Pit B1	0.124	Paved Supp. Grassed	100 0 0	0 0 0	38 38 38	1 1 1	0.015 0.25 0.25	2.55 13.77	0.058	Pit B2	0	0	0	Acor Standarc	ACOR PIT TY	0.058	0	0	0	1.969	26	0.58	1050	64.79	64.64	66.294	66.18	2.19	0.29	A1-5	0, Qg/Qo=0.02	66.36	68.65	2.29	Pit B1
100	Pit B1	0.124	Paved Grassed	< - - -	- - - -	as above	- - - -	- - - >	2.29 12.38	0.075	Pit B2	0	0	0			0.075	0	0	0	2.271						67.499	67.387	2.53	0.27	A1-5	0, Qg/Qo=0.02	67.56	68.65	1.09	Pit B1
20	Pit C2	0.0572	Paved Supp. Grassed	100 0 0	0 0 0	20 20 20	1 1 1	0.015 0.25 0.25	1.73 9.37	0.027	Pit C3	0	0	0	Acor Standarc	ACOR PIT TY	0.027	0	0	0	0.025	40	1	375	67.83	67.43	67.926	67.526	1.13	5.93	A1-4	0.0, Vo2/(2gDc	68.03	68.53	0.5	Pit C2
100	Pit C2	0.0572	Paved Grassed	< - - -	- - - -	as above	- - - -	- - - >	1.56 8.42	0.035	Pit C3	0	0	0			0.035	0	0	0	0.033						67.941	67.832	1.22	5.93	A1-4	0.0, Vo2/(2gDc	68.06	68.53	0.47	Pit C2
20	Pit C3	0.0572	Paved Supp. Grassed	100 0 0	0 0 0	20 20 20	1 1 1	0.015 0.25 0.25	1.73 9.37	0.027	Pit C4	0	0	0	Acor Standarc	ACOR PIT TY	0.027	0	0	0	0.025	40	1	375	67.83	67.43	67.926	67.526	1.13	5.93	A1-4	0.0, Vo2/(2gDc	68.03	68.53	0.5	Pit C3
100	Pit C3	0.0572	Paved Grassed	< - - -	- - - -	as above	- - - -	- - - >	1.56 8.42	0.035	Pit C4	0	0	0			0.035	0	0	0	0.059						68.162	68.046	0.57	4.91	A1-4	0.5, Vo2/(2gDc	68.33	68.53	0.2	Pit C3
20	Pit C4	0.0572	Paved Supp. Grassed	100 0 0	0 0 0	20 20 20	1 1 1	0.015 0.25 0.25	1.73 9.37	0.027	Pit C5	0	0	0	Acor Standarc	ACOR PIT TY	0.027	0	0	0	0.025	40	1	375	67.83	67.43	67.926	67.526	1.13	5.93	A1-4	0.0, Vo2/(2gDc	68.03	68.53	0.5	Pit C4
100	Pit C4	0.0572	Paved Grassed	< - - -	- - - -	as above	- - - -	- - - >	1.56 8.42	0.035	Pit C5	0	0	0			0.035	0	0	0	0.056						68.575	68.205	0.51	4.32	A1-4	0.8, Vo2/(2gDc	68.58	68.53	-0.05	Pit C4
20	Pit C5	0.0572	Paved Supp. Grassed	100 0 0	0 0 0	20 20 20	1 1 1	0.015 0.25 0.25	1.73 9.37	0.027	Pit C6	0	0	0	Acor Standarc	ACOR PIT TY	0.027	0	0	0	0.025	40	1	375	67.83	67.43	67.926	67.526	1.13	5.93	A1-4	0.0, Vo2/(2gDc	68.03	68.53	0.5	Pit C5
100	Pit C5	0.0572	Paved Grassed	< - - -	- - - -	as above	- - - -	- - - >	1.56 8.42	0.035	Pit C6	0.161	4	0.05			0.19599999	0	0	0	0.089						68.562	68.372	0.81	4	A1-4	1.0, Vo2/(2gDc	68.66	68.53	-0.13	Pit C5
20	Pit C6	0.0572	Paved Supp. Grassed	100 0 0	0 0 0	20 20 20	1 1 1	0.015 0.25 0.25	1.73 9.37	0.027	Pit C7	0	0	0	Acor Standarc	ACOR PIT TY	0.027	0	0	0	0.025	40	1	375	67.83	67.43	67.926	67.526	1.13	5.93	A1-4	0.0, Vo2/(2gDc	68.03	68.53	0.5	Pit C6
100	Pit C6	0.0572	Paved Grassed	< - - -	- - - -	as above	- - - -	- - - >	1.56 8.42	0.035	Pit C7	0.262	4	0.08			0.29699999	0.161	4	0.05	0.092						68.604	68.483	0.84	4.08	A1-4	1.0, Vo2/(2gDc	68.67	68.53	-0.14	Pit C6
20	Pit C7	0.0572	Paved Supp. Grassed	100 0 0	0 0 0	20 20 20	1 1 1	0.015 0.25 0.25	1.73 9.37	0.027	Pit C8	0	0	0	Acor Standarc	ACOR PIT TY	0.027	0	0	0	0.025	40	1	375	67.83	67.43	67.926	67.526	1.13	5.93	A1-4	0.0, Vo2/(2gDc	68.03	68.53	0.5	Pit C7
100	Pit C7	0.0572	Paved Grassed	< - - -	- - - -	as above	- - - -	- - - >	1.56 8.42	0.035	Pit C8	0.317	4	0.09			0.352	0.262	4	0.08	0.088						68.643	68.547	0.8	3.97	A1-4	1.1, Vo2/(2gDc	68.64	68.53	-0.11	Pit C7
20	Pit C8	0.0572	Paved Supp. Grassed	100 0 0	0 0 0	20 20 20	1 1 1	0.015 0.25 0.25	1.73 9.37	0.027	Pit C9	0	0	0	Acor Standarc	ACOR PIT TY	0.027	0	0	0	0.025	40	1	375	67.83	67.43	67.926	67.566	1.12	5.93	A1-4	0.0, Vo2/(2gDc	68.03	68.53	0.5	Pit C8
100	Pit C8	0.0572	Paved Grassed	< - - -	- - - -	as above	- - - -	- - - >	1.56 8.42	0.035	Pit C9	0.347	4	0.1			0.382	0.317	4	0.09	0.088						68.64	68.614	0.8	3.94	A1-4	1.1, Vo2/(2gDc	68.64	68.53	-0.11	Pit C8
20	Pit C9	0.0572	Paved Supp. Grassed	100 0 0	0 0 0	20 20 20	1 1 1	0.015 0.25 0.25	1.73 9.37	0.027	Pit C10	0	0	0	Acor Standarc	ACOR PIT TY	0.027	0	0	0	0.025	40	1	375	67.83	67.43	67.926	67.654	1.12	5.93	A1-4	0.0, Vo2/(2gDc	68.03	68.53	0.5	Pit C9
100	Pit C9	0.0572	Paved Grassed	< - - -	- - - -	as above	- - - -	- - - >	1.56 8.42	0.035	Pit C10	0.352	4	0.1			0.38699999	0.347	4	0.1	0.088						68.654	68.655	0.79	3.76	A1-4	1.2, Vo2/(2gDc	68.65	68.53	-0.12	Pit C9
20	Pit C10	0.0572	Paved Supp. Grassed	100 0 0	0 0 0	20 20 20	1 1 1	0.015 0.25 0.25	1.73 9.37	0.027	Pit C11	0	0	0	Acor Standarc	ACOR PIT TY	0.027	0	0	0	0.025	40	1	375	67.83	67.43	67.926	67.696	1.12	5.93	A1-4	0.0, Vo2/(2gDc	68.03	68.53	0.5	Pit C10
100	Pit C10	0.0572	Paved Grassed	< - - -	- - - -	as above	- - - -	- - - >	1.56 8.42	0.035	Pit C11	0.342	4	0.1			0.377	0.352	4	0.1	0.089						68.66	68.662	0.8	3.74	A1-4	1.2, Vo2/(2gDc	68.66	68.53	-0.13	Pit C10
20	Pit C11	0.0572	Paved Supp. Grassed	100 0 0	0 0 0	20 20 20	1 1 1	0.015 0.25 0.25	1.73 9.37	0.027	Pit C12	0	0	0	Acor Standarc	ACOR PIT TY	0.027	0	0	0	0.025	40	1	375	67.83	67.43	67.926	67.831	1.12	5.93	A1-4	0.0, Vo2/(2gDc	68.03	68.53	0.5	Pit C11
100	Pit C11	0.0572	Paved Grassed	< - - -	- - - -	as above	- - - -	- - - >	1.56 8.42	0.035	Pit C12	0.318	4	0.09			0.35300002	0.342	4	0.1	0.088						68.68	68.69	0.8	3.58	A1-4	1.3, Vo2/(2gDc	68.68	68.53	-0.15	Pit C11
20	Pit C12	0.0572	Paved Supp. Grassed	100 0 0	0 0 0	20 20 20	1 1 1	0.015 0.25 0.25	1.73 9.37	0.027	Pit C13	0	0	0	Acor Standarc	ACOR PIT TY	0.027	0	0	0	0.025	40	1	375	67.83	67.43	67.93	67.925	1.07	5.93	A1-4	0.0, Vo2/(2gDc	68.03	68.53	0.5	Pit C12
100	Pit C12	0.0572	Paved Grassed	< - - -	- - - -	as above	- - - -	- - - >	1.56 8.42	0.035	Pit C13	0.267	4	0.08			0.30199999	0.318	4	0.09	0.081						68.68	68.708	0.73	3.5	A1-4	1.4, Vo2/(2gDc	68.68	68.53	-0.15	Pit C12
20	Pit C13	0.0572	Paved Supp. Grassed	100 0 0	0 0 0	20 20 20	1 1 1	0.015 0.25 0.25	1.73 9.37	0.027	Pit C14	0	0	0	Acor Standarc	ACOR PIT TY	0.027	0	0	0	0.025	40	1	375	67.83	67.43	68.006	67.99	0.49	5.93	A1-4	0.0, Vo2/(2gDc	68.1	68.53	0.43	Pit C13
100	Pit C13	0.0572	Paved Grassed	< - - -	- - - -	as above	- - - -	- - - >	1.56 8.42	0.035	Pit C14	0.21	4	0.06			0.245	0.267	4	0.08	0.083						68.68	68.717	0.75	3.45	A1-4	1.4, Vo2/(2gDc	68.68	68.53	-0.15	Pit C13
20	Pit C14	0.0572	Paved Supp. Grassed	100 0 0	0 0 0	20 20 20	1 1 1	0.015 0.25 0.25	1.73 9.37	0.027	Pit C15	0	0	0	Acor Standarc	ACOR PIT TY	0.027	0	0	0	0.032	40	1	375	67.83	67.43	68.069	68.066	0.43	5.22	A1-4	0.4, Vo2/(2gDc	68.12	68.53	0.41	Pit C14
100	Pit C14	0.0572	Paved Grassed	< - - -	- - - -	as above	- - - -	- - - >	1.56 8.42	0.035	Pit C15	0.145	4	0.05			0.18000001	0.21	4	0.06	0.079						68.68	68.728	0.71	3.4	A1-4	1.5, Vo2/(2gDc	68.68	68.53	-0.15	Pit C14
20	Pit C15	0.0572	Paved Supp. Grassed	100 0 0	0 0 0	20 20 20	1 1 1	0.015 0.25 0.25	1.73 9.37	0.027	Pit C16	0	0	0	Acor Standarc	ACOR PIT TY	0.027	0	0	0	0.038	40	1	375	67.83	67.43	68.195	68.117	0.35	5.07	A1-4	0.4, Vo2/(2gDc	68.27	68.53	0.26	Pit C15
100	Pit C15	0.0572	Paved Grassed	< - - -	- - - -	as above	- - - -	- - - >	1.56 8.42	0.035	Pit C16	0.078	4	0.03			0.113	0.145	4	0.05	0.111						68.68	68.735	1.01	3.36	A1-4	1.5, Vo2/(2gDc	68.68	68.53	-0.15	Pit C15
20	D25 Grated D	0.104	Paved Supp. Grassed	100 0 0	0 0 0	47 47 47	2 2 2	0.015 0.25 0.25	2.35 12.71	0.048					Acor Standarc	ACOR PIT TY	0.048	0.008	1.92	0.01	0.04	16	-1.94	375	66.72	67.03	67.288	67.281	0.51	5.11	A1-4	0.4, Vo2/(2gDc	67.31	68.5	1.19	D25 Grated Drain
100	D25 Grated D	0.104	Paved Grassed	< - - -	- - - -	as above	- - - -	- - - >	2.11 11.42	0.063							0.063	0.014	4	0.01	0.056						67.787	67.764	0.51	3.09	A1-4	1.8, Vo2/(2gDc	67.82	68.5	0.68	D25 Grated Drain
20	D24 Grated D	0.0811	Paved Supp. Grassed	81 0 19	0 0 0	47 47 47	2 2 2	0.015 0.25 0.25	2.35 12.71	0.032					Acor Standarc	ACOR PIT TY	0.032	0.003	1.23	0.01	0.068	21.5	1.3	375	67.01	66.73	67.246	67.239	0.93	1.82	A1-5	0, Qg/Qo=0.41	67.28	67.95	0.67	D24 Grated Drain
100	D24 Grated D	0.0811	Paved Grassed	< - - -	- - - -	as above	- - - -	- - - >	2.11 11.42	0.042							0.042	0.007	1.63	0.01	0.094						67.715	67.55	0.85	1.51	A1-5	0, Qg/Qo=0.39	67.76	67.95	0.19	D24 Grated Drain
20	Pit D23	0.0591	Paved Supp. Grassed	57 0 43	0 0 0	19 19 19	1 1 1	0.015 0.25 0.25	2.31 12.52	0.019	Pit D22	0.001	0.74	0	Acor Standarc	ACOR PIT TY	0.02	0.001	0.84	0	0.085	23	0.52	375	66.71	66.59	67.204	67.173	0.77	1.77	A1-18	0, Qg/Qo=0.22	67.24	67.55	0.31	Pit D23
100	Pit D23	0.0591	Paved Grassed	< - - -	- - - -	as above	- - - -	- - - >	1.51 8.17	0.026	Pit D22	0.002	1.13	0			0.028	0.082	4	0.03	0.103						67.542	67.575	0.93	1.87	A1-18	0, Qg/Qo=0.21	67.55	67.55	0	Pit D23
20	Pit D22	0.0612	Paved Supp. Grassed	45 0 55	0 0 0	20 20 20	1 1 1	0.015 0.25 0.25	2.39 12.91	0.018					Acor Standarc	ACOR PIT TY	0.018	0.001	0.74	0	0.1	20	0.5	375	66.57	66.47	67.12	67.06	0.9	1.79	A1-18	0, Qg/Qo=0.17	67.17	67.8	0.63	Pit D22
100	Pit D22	0.0612	Paved Grassed	< - - -	- - - -	as above	- - - -	- - - >	2.15 11.63	0.024							0.024	0.002	1.13	0	0.123						67.538	67.529	1.11	1.72	A1-18	0, Qg/Qo=0.18	67.57	67.8	0.23	Pit D22
20	Pit C16	0.0572	Paved Supp. Grassed	100 0 0	0 0 0	20 20 20	1 1 1	0.015 0.25 0.25	1.73 9.37	0.027					Acor Standarc	ACOR PIT TY	0.027	0	0	0	0.049	40	1	375	67.83	67.43	68.196	68.135	0.44	5.02	A1-4	0.4, Vo2/(2gDc	68.23	68.53	0.3	Pit C16
100	Pit C16	0.0572	Paved Grassed	< - - -	- - - -	as above	- - - -	- - - >	1.56 8.42	0.035							0.035	0.078	4	0.03	0.081						68.68	68.737	0.73	3.38	A1-4	1.5, Vo2/(2gDc	68.68	68.53	-0.15	Pit C16

20	**Pit G5**	0.1433	Paved	100	0	52	2.5	0.015	2.33	0.066	D25 Grated Dr	0.008	1.92	0.01	Acor Standarc	ACOR PIT TY	0.074	0.02	4	0.01	0.054	32.5	0.37	375	66.12	66	66.297	66.27	1.05	5.93	A1-4	).0, Vo2/(2gDc	66.41	66.79	0.38	**Pit G5**
			Supp.	0	0	52	2.5	0.25																									
			Grassed	0	0	52	2.5	0.25	12.63																									
100	**Pit G5**	0.1433	Paved	< - - -	- - - -	as above	- - - -	- - - >	2.1	0.087	D25 Grated Dr	0.014	4	0.01			0.101	0.067	4	0.03	0.065						66.775	66.78	0.59	4.42	A1-4	).7, Vo2/(2gDc	66.79	66.79	0	**Pit G5**
			Grassed						11.35																									
20	**Pit G4**	0.0661	Paved	100	0	32	3.5	0.015	1.58	0.031	D24 Grated Dr	0.003	1.23	0.01	Acor Standarc	ACOR PIT TY	0.034	0.004	1.73	0	0.082	27.5	0.36	375	65.98	65.88	66.204	66.14	1.2	1.62	A1-5	0, Qg/Qo=0.36	66.27	66.83	0.56	**Pit G4**
			Supp.	0	0	32	3.5	0.25																									
			Grassed	0	0	32	3.5	0.25	8.53																									
100	**Pit G4**	0.0661	Paved	< - - -	- - - -	as above	- - - -	- - - >	1.42	0.04	D24 Grated Dr	0.007	1.63	0.01			0.047	0.008	4	0.01	0.1						66.755	66.73	0.9	1.34	A1-5	0, Qg/Qo=0.37	66.78	66.83	0.05	**Pit G4**
			Grassed						7.67																									
20	**Pit G3**	0.0891	Paved	0	0	15	1	0.015	1.85	0.024	Pit D23	0.001	0.84	0	Acor Standarc	ACOR PIT TY	0.029	0.002	1.33	0	0.099	27.5	0.73	375	65.86	65.66	66.019	65.921	2.22	1.72	A1-7	0, Qg/Qo=0.22	66.14	66.75	0.61	**Pit G3**
			Supp.	0	0	15	1	0.25			Pit G4	0.004	1.73	0																				
			Grassed	100	0	15	1	0.25	9.99																									
100	**Pit G3**	0.0891	Paved	< - - -	- - - -	as above	- - - -	- - - >	1.66	0.036	Pit D23	0.082	4	0.03			0.126	0.048	4	0.02	0.132						66.644	66.529	1.2	1.48	A1-7	0, Qg/Qo=0.41	66.73	66.75	0.02	**Pit G3**
			Grassed						9		Pit G4	0.008	4	0.01																				
20	**Pit G2**	0.0169	Paved	100	0	18	5	0.015	1	0.008	E1 Grated Dra	0	0	0	Acor Standarc	ACOR PIT TY	0.01	0	0	0	0.106	30.5	0.69	375	65.64	65.43	65.885	65.765	1.39	0.49	A1-5	0, Qg/Qo=0.07	65.92	66.5	0.58	**Pit G2**
			Supp.	0	0	18	5	0.25			Pit G3	0.002	1.33	0																				
			Grassed	0	0	18	5	0.25	5.43																									
100	**Pit G2**	0.0169	Paved	< - - -	- - - -	as above	- - - -	- - - >	0.9	0.01	E1 Grated Dra	0.009	1.73	0.01			0.067	0	0	0	0.152						66.435	66.22	1.37	1	A1-5	0, Qg/Qo=0.27	66.53	66.5	-0.03	**Pit G2**
			Grassed						4.88		Pit G3	0.048	4	0.02																				
20	**Pit G1**	0.0761	Paved	0	0	10	1	0.015	1.45	0.023	Pit G2	0	0	0	Acor Standarc	ACOR PIT TY	0.023	0.002	1.23	0	0.126	42	0.98	375	65.41	65	65.632	65.359	1.85	1.68	A1-7	0, Qg/Qo=0.17	65.76	66.25	0.49	**Pit G1**
			Supp.	0	0	2	1	0.25																									
			Grassed	100	0	10	1	0.25	7.83																									
100	**Pit G1**	0.0761	Paved	< - - -	- - - -	as above	- - - -	- - - >	1.3	0.032	Pit G2	0	0	0			0.032	0.003	1.63	0	0.175						66.036	65.605	1.58	1.51	A1-7	0, Qg/Qo=0.15	66.22	66.25	0.03	**Pit G1**
			Grassed						7.05																									
20	**JP by others**		Paved								Pit G1	0.002	1.23	0	Acor Standarc	ACOR PIT TY	0.002	0	0	0	0.127	5	1	375	64.99	64.94	65.2	65.177	2	2.26	H-O'L	o=0.01, S/Do	65.36	65.75	0.39	**JP by others**
			Supp.																															
			Grassed																															
100	**JP by others**		Paved	< - - -	- - - -	as above	- - - -	- - - >			Pit G1	0.003	1.63	0			0.003	0	0	0	0.178						65.363	65.249	1.83	2.3	H-O'L	o=0.06, S/Do	65.6	65.75	0.15	**JP by others**
			Grassed																															
20	**Basin E**	0.2278	Paved	0	0	227	0.5	0.015	17.46	0.014	Pit C1	0	0	0			0.014	3.488	4	0.91														**Basin E**
			Supp.	0	0	227	0.5	0.25			Pit A1	0	0	0																				
			Grassed	100	0	227	0.5	0.25	94.42		Pit A2	0	0	0																				
											Pit B0	0	0	0																				
											Pit B1	0	0	0																				
100	**Basin E**	0.2278	Paved	< - - -	- - - -	as above	- - - -	- - - >	15.72	0.024	Pit C1	0	0	0			0.024	4.02	4	1.05														**Basin E**
			Grassed						85.01		Pit A1	0	0	0																				
											Pit A2	0	0	0																				
											Pit B0	0	0	0																				
											Pit B1	0	0	0																				

NOTES

This sheet presents results from an ILSAX, extended rational method (ERM) or rational method model implemented in the DRAINS program,
(www.watercom.com.au) involving considerable calculations with multiple rainfall patterns, and complex hydraulic computations.
Therefore, unlike older rational method calculation sheets, this sheet does not portray hand calculations.
It presents the key model inputs and outputs of interest to reviewers.

Depending on inputs, the table may show results for a minor storm, a major storm, or both.
There may be multiple rows for up to three overflow routes coming to a pit.
You can edit headings or delete columns or rows.

The contents of each column are discussed below:

Column 1: Design average recurrence Interval (years); values for minor storms, major storms or both may be displayed. Numerical values are not available for the rational method, but users can enter these.
Column 2: Pit Name from DRAINS (The connecting sub-catchment, downstream pipe and overflow route are assumed to have
similar names, so they do not need to be entered in the table.)
Column 3: Sub-Catchment Area (ha)
Column 4: Land-Use Type: paved, supplementary and grassed areas (in different rows) for ILSAX, or impervious and pervious areas for the ERM
Column 5: Percentages of paved, supplementary and grassed areas for ILSAX, or impervious and pervious areas for ERM
Column 6: Constant flow times for the paved, supplementary and grassed areas (minutes) for ILSAX, or impervious and impervious areas for the ERM
Column 7: Lengths of paved, supplementary and grassed area flow path segments (m) for ILSAX, or impervious and impervious areas for the ERM
Column 8: Slopes of paved, supplementary and grassed area flow path segments (%) for ILSAX, or impervious and impervious areas for the ERM
Column 9: Roughnesses of paved, supplementary and grassed area flow path segments (Manning's values) for ILSAX, or impervious and impervious areas for the ERM
Column 10: Total flow times for the paved, supplementary and grassed areas (minutes) for ILSAX, or impervious and pervious areas for the ERM
For the rational methoid, it is the total catchment time of concentration.
Column 11: Peak Sub-Catchment Flowrate (m^3/s). For the rational method, the output indicates whether this is a full catchment or partial area estimate.
Column 12: Origin of Overflows, the names of any pits or nodes from which overflows come to the pit
Column 13: Peak Overflows from upstream pits or nodes(m3/s), which may include flows from the sub-catchment through which they flow.
- Not outputted for the rational method.)
Column 14: Approach Flow Width (m) - not outputted for the rational method.
Column 15: Approach Flow Depth x Velocity (m^2/s) - not outputted for the rational method
Column 16: Inlet Family, in the DRAINS classification
Column 17: Inlet Size, in the DRAINS classification
Column 18: Total Approach Flow (m^3/s), local sub-catchment runoff plus overflows directed to the pit
Column 19: Bypass Flow (m^3/s), the overflow occurring because of lack of inlet capacity or overflowing of the pipe system
Column 20: Overflow Width (m) just downstream of the pit - not outputted for the rational method; inspect the DRAINS model for this information.
Column 21: Overflow Route Depth x Velocity (m^2/s) just downstream of the pit - not outputted for the rational method; inspect the DRAINS model for this information.
Column 21a: Baseflow or Direct Inflow Peak (m^3/s), if present in the model; otherwise this column does not appear
Column 22: Flow in Pipe (m^3/s)
Column 23: Pipe Length (mm)
Column 24: Pipe Slope (%)
Column 25: Pipe Diameter (mm) or Box Dimensions (m)
Column 28: Upstream Pipe Hydraulic Grade Line Level (inside the pipe) (m AHD)
Column 29: Downstream Pipe Hydraulic Grade Line Level (m AHD)
Column 30: Pipe Flow Velocity (m/s), for full or part flow
Column 31: Pit Pressure Change Coefficient, the Ku value applying to the main line through the pit
Column 31a: Chart Structure Number. If the QUDM method for determining Ku is applied, the number of the Chart in QUDM (2008) that is used to determine pit pressure change K factors is displayed.
If this is given as 'H-O'L' the equations in a paper by Hare and O'Loughlin are used.
Column 31b: Ratios used to define a K value from the appropriate QUDM chart, if teh QUDM method is applied
Column 32: Water Surface Elevation (m AHD)
Column 33: Surface or Kerb and Channel (Kerb and Gutter) Obvert Level (m AHD)
Column 34: Freeboard (m), the difference between the levels in Columns 56 and 55
Column 35: Pit Name (repeated)

ILSAX CALCULATION SUMMARY SHEET

DRAINS results prepared from Version 2016.14

Total Catchment (11.7 impervious + 3.49 pervious = 15.2 total ha)

Soil Type User to enter **AMC** User to enter

MINOR STORMS:

No.	Storm	Rainfall Volume (m^3)	Runoff Volume (m^3)	Impervious Runoff Vol. (m^3)	Pervious Runoff Vol. (m^3)
1	AR&R 20 yea	2114.74	606.19 (76.0%	512.80 (92.8%	93.39 (19.3%)
2	AR&R 20 yea	3235.15	661.04 (82.3%	376.53 (95.3%	284.51 (38.4%)
3	AR&R 20 yea	4040.55	421.34 (84.7%	997.42 (96.2%	23.93 (45.8%)
4	AR&R 20 yea	4683.28	023.45 (85.9%	492.90 (96.7%	30.55 (49.4%)
5	AR&R 20 yea	5224.57	524.68 (86.6%	810.19 (97.1%	14.49 (51.3%)
6	AR&R 20 yea	5695.52	945.10 (86.8%	273.24 (97.3%	71.86 (51.5%)
7	AR&R 20 yea	6840.56	989.23 (87.6%	155.96 (97.8%	33.27 (53.2%)
8	AR&R 20 yea	7741.18	812.63 (88.0%	850.25 (98.0%	62.38 (54.3%)
9	AR&R 20 yea	10271.63	079.52 (88.4%	800.99 (98.5%	278.53 (54.3%)
10	AR&R 20 yea	12050.4	678.10 (88.6%	172.24 (98.7%	505.86 (54.5%)
11	AR&R 20 yea	14125.28	473.40 (88.3%	771.79 (98.9%	701.61 (52.6%)
12	AR&R 20 yea	15822.65	948.23 (88.2%	080.33 (99.0%	867.90 (51.5%)

MAJOR STORMS:

No.	Storm	Rainfall Volume (m^3)	Runoff Volume (m^3)	Impervious Runoff Vol. (m^3)	Pervious Runoff Vol. (m^3)
1	AR&R 100 ye	2795.06	274.21 (81.4%	037.27 (94.5%	236.95 (37.0%)
2	AR&R 100 ye	4276.72	694.92 (86.4%	179.48 (96.4%	515.44 (52.6%)
3	AR&R 100 ye	5334.78	705.96 (88.2%	995.15 (97.1%	710.81 (58.2%)
4	AR&R 100 ye	6180.55	508.86 (89.1%	647.15 (97.5%	361.70 (60.9%)
5	AR&R 100 ye	6894.02	171.35 (89.5%	197.17 (97.8%	974.19 (61.7%)
6	AR&R 100 ye	7515.68	749.98 (89.8%	676.41 (98.0%	073.57 (62.4%)
7	AR&R 100 ye	9028.95	160.19 (90.4%	843.00 (98.3%	317.19 (63.7%)
8	AR&R 100 ye	10218.69	268.45 (90.7%	760.18 (98.5%	508.27 (64.4%)
9	AR&R 100 ye	13544.5	339.48 (91.1%	324.02 (98.9%	015.46 (65.0%)
10	AR&R 100 ye	15868.75	465.24 (91.2%	115.84 (99.0%	349.40 (64.6%)
11	AR&R 100 ye	18576.33	890.08 (90.9%	203.10 (99.2%	686.98 (63.1%)
12	AR&R 100 ye	20804.33	847.12 (90.6%	920.70 (99.3%	926.42 (61.4%)

LOCATION AND LAND-USE | **TIME AND RUNOFF** | **INLET DESIGN** | **PIPE SYSTEM DESIGN** | **PIT RESULTS**

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	31a	31b	32	33	34	35	36
Design ARI	Pit Name	Sub-Catchment Area	Land-Use	Percent-age	Constant Flow Time (minutes)	Length (m)	Kinematic Wave Parameters Slope (%)	Roughness n	Total Time tc (minutes)	Peak Sub-Catchment Flowrate (m^3/s) "worst storm	Origin of Approach Flows	Overflows Approaching Pit Flowrate (m^3/s)	Flow Width (m)	Depth x Velocity (m^2/s)	Inlet Family	Inlet Size	Total Approach Flow (m^3/s)	Overflow Leaving Pit Bypass Flow (m^3/s)	Flow Width (m)	Depth x Velocity (m^2/s)	Peak Flow in Pipe (m^3/s)	Reach Length (m)	Pipe Slope (m)	Pipe Diameter (mm)	U/S Pipe Invert Level (m)	D/S Pipe Invert Level	U/S HGL in Pipe (m)	D/S HGL in Pipe (m)	Pipe Flow Velocity (m/s)	Pressure Change Coeff. Ku	QUDM Chart No.	QUDM Chart Ratios	Water Surface Elevation (m)	Surface Level (m)	Free-board (m)	Pit Name	Remarks
20	LC\1	0.1	Paved	0	5				5	0.03	LB\1	0	0	0	JUNCTION P	0.9 x 0.9 GRA	0.03	0	0	0	0.028	4.771	1.01	375	62.989	62.941	63.398	63.397	0.26	5.84	A1-4	)0, Vo2/(2gDc	63.41	64.283	0.87	LC\1	
			Supp.	0	0																																	
			Grassed	100	10				10																													
100	LC\1	0.1	Paved	< - - -	- - - -	as above	- - - -	- - - >	5	0.04	LB\1	0	0	0			0.04	0	0	0	0.037						63.902	63.899	0.33	3.4	A1-4	1.5, Vo2/(2gDc	63.92	64.283	0.36	LC\1	
			Grassed						10																													
20	CD\5	0.0591	Paved	90	5				5	0.025	CD\4	0.002	0.42	0.01	GRATED KEF	1.8m LINTEL	0.027	0.002	0.41	0.01	0.253	50	0.5	525	62.893	62.643	63.35	63.286	1.26	0.7	H-O'L	)o=0.09, S/Do	63.4	64.323	0.93	CD\5	
			Supp.	0	0																																	
			Grassed	10	10				10																													
100	CD\5	0.0591	Paved	< - - -	- - - -	as above	- - - -	- - - >	5	0.032	CD\4	0.005	0.73	0.02			0.037	0.005	0.7	0.02	0.277						63.853	63.733	1.28	0.65	H-O'L	)o=0.09, S/Do	63.9	64.323	0.42	CD\5	
			Grassed						10																													
20	CD\6	0.0594	Paved	90	5				5	0.025	CD\5	0.002	0.41	0.01	GRATED KEF	1.8m LINTEL	0.027	0.002	0.41	0.01	0.255	47.599	0.5	525	62.613	62.375	63.256	63.175	1.18	0.56	A1-5	0, Qg/Qo=0.0	63.29	64.073	0.79	CD\6	
			Supp.	0	0																																	
			Grassed	10	10				10																													
100	CD\6	0.0594	Paved	< - - -	- - - -	as above	- - - -	- - - >	5	0.032	CD\5	0.005	0.7	0.02			0.037	0.005	0.7	0.02	0.286						63.693	63.563	1.32	0.49	A1-5	0, Qg/Qo=0.0	63.73	64.073	0.34	CD\6	
			Grassed						10																													
20	CD\7	0.0563	Paved	90	5				5	0.024	CD\6	0.002	0.41	0.01	GRATED KEF	1.8m LINTEL	0.026	0.002	0.39	0.01	0.259	33.904	0.5	600	62.345	62.176	63.17	63.14	0.91	0.15	A1-5	7, Qg/Qo=0.0	63.17	63.835	0.66	CD\7	
			Supp.	0	0																																	
			Grassed	10	10				10																													
100	CD\7	0.0563	Paved	< - - -	- - - -	as above	- - - -	- - - >	5	0.03	CD\6	0.005	0.7	0.02			0.035	0.004	0.65	0.02	0.291						63.558	63.505	1.03	0.09	A1-5	7, Qg/Qo=0.0	63.56	63.835	0.27	CD\7	
			Grassed						10																													
20	CD\8	0.0403	Paved	90	5				5	0.017	CD\7	0.002	0.39	0.01	GRATED KEF	1.8m LINTEL	0.019	0.001	0.31	0.01	0.261	55.557	0.5	600	62.146	61.868	63.125	63.075	0.92	0.44	A1-5	0, Qg/Qo=0.0	63.14	63.665	0.52	CD\8	
			Supp.	0	0																																	
			Grassed	10	10				10																													
100	CD\8	0.0403	Paved	< - - -	- - - -	as above	- - - -	- - - >	5	0.022	CD\7	0.004	0.65	0.02			0.026	0.002	0.36	0.01	0.304						63.482	63.387	1.08	0.4	A1-5	0, Qg/Qo=0.0	63.51	63.665	0.16	CD\8	
			Grassed						10																													
20	CD\9	0.0655	Paved	90	5				5	0.028	CD\8	0.001	0.31	0.01	GRATED KEF	1.8m LINTEL	0.029	0.003	0.45	0.01	0.27	17.593	0.5	600	61.838	61.75	63.021	62.996	0.96	1.52	A1-14	0, Qg/Qo=0.0	63.07	63.387	0.31	CD\9	
			Supp.	0	0																																	
			Grassed	10	10				10																													
100	CD\9	0.0655	Paved	< - - -	- - - -	as above	- - - -	- - - >	5	0.035	CD\8	0.002	0.36	0.01			0.037	0.069	2.71	0.06	0.299						63.334	63.301	1.06	1.33	A1-14	0, Qg/Qo=0.0	63.39	63.387	0	CD\9	
			Grassed						10																													
20	LD\1	0.1179	Paved	0	5				5	0.035	LC\1	0	0	0	JUNCTION P	0.9 x 0.9 GRA	0.035				0.035	21.817	2	375	62.036	61.6	62.114	61.678	2.12	5.93	A1-4	)0, Vo2/(2gDc	62.23	63.681	1.45	LD\1	
			Supp.	0	0																																	
			Grassed	100	10				10																													
100	LD\1	0.1179	Paved	< - - -	- - - -	as above	- - - -	- - - >	5	0.047	LC\1	0	0	0			0.047				0.047						62.127	61.69	2.31	5.93	A1-4	)0, Vo2/(2gDc	62.26	63.681	1.42	LD\1	
			Grassed						10																													
20	Pit G5	0.1433	Paved	100	0	52	2.5	0.015	2.34	0.066					Acor Standar	ACOR PIT TY	0.066	0.009	1.28	0.01	0.058	32.5	0.37	375	66.12	66	66.309	66.241	1.04	4.81	A1-4	)6, Vo2/(2gDc	66.44	66.79	0.35	Pit G5	
			Supp.	0	0	18	5	0.25																													
			Grassed	0	0	18	5	0.25	5.43																													
100	Pit G5	0.1433	Paved	< - - -	- - - -	as above	- - - -	- - - >	2.09	0.088							0.088	0.015	1.58	0.02	0.073						66.355	66.304	1	5.93	A1-4	)0, Vo2/(2gDc	66.57	66.79	0.22	Pit G5	
			Grassed						4.86																													
20	Pit G4	0.0661	Paved	100	0	32	3.5	0.015	1.58	0.031					Acor Standar	ACOR PIT TY	0.031	0.001	0.66	0	0.087	27.5	0.36	375	65.98	65.88	66.173	66.11	1.51	1.28	A1-5	0, Qg/Qo=0.2	66.24	66.79	0.55	Pit G4	
			Supp.	0	0	32	3.5	0.25																													
			Grassed	0	0	32	3.5	0.25	8.54																													
100	Pit G4	0.0661	Paved	< - - -	- - - -	as above	- - - -	- - - >	7.64	0.04							0.04	0.002	0.81	0.01	0.109						66.21	66.154	1.54	1.4	A1-5	0, Qg/Qo=0.3	66.3	66.79	0.49	Pit G4	
			Grassed																																			
20	Pit G3	0.0891	Paved	0	0	15	1	0.015	1.93	0.024					Acor Standar	ACOR PIT TY	0.024	0.001	0.53	0	0.106	27.5	0.73	375	65.86	65.66	66.012	65.9	2.54	1.05	A1-5	0, Qg/Qo=0.2	66.11	66.79	0.68	Pit G3	
			Supp.	0	0	15	1	0.25																													
			Grassed	100	0	15	1	0.25	10.46																													
100	Pit G3	0.0891	Paved	< - - -	- - - -	as above	- - - -	- - - >	1.65	0.036							0.036	0.002	0.74	0.01	0.13						66.068	65.952	2.07	1.04	A1-5	0, Qg/Qo=0.2	66.15	66.79	0.64	Pit G3	
			Grassed						8.95																													
20	Pit G2	0.0169	Paved	100	0	18	5	0.015	1	0.008					Acor Standar	ACOR PIT TY	0.008	0	0	0	0.113	30.5	0.69	375	65.64	65.43	65.856	65.716	1.72	0.46	A1-5	0, Qg/Qo=0.0	65.9	66.79	0.89	Pit G2	
			Supp.	0	0	18	5	0.25																													
			Grassed	0	0	18	5	0.25	5.43																													
100	Pit G2	0.0169	Paved	< - - -	- - - -	as above	- - - -	- - - >	0.9	0.01							0.01	0	0	0	0.137						65.917	65.841	1.57	0.45	A1-5	0, Qg/Qo=0.0	65.95	66.79	0.84	Pit G2	
			Grassed						4.86																													
20	Pit G1	0.0761	Paved	0	0	10	1	0.015	1.52	0.025					Acor Standar	ACOR PIT TY	0.025	0.001	1.95	0	0.135	42	0.98	375	65.41	65	65.616	65.216	2.18	0.9	A1-5	0, Qg/Qo=0.1	65.72	66.79	1.07	Pit G1	
			Supp.	0	0	10	1	0.25																													
			Grassed	100	0	10	1	0.25	8.2																													
100	Pit G1	0.0761	Paved	< - - -	- - - -	as above	- - - -	- - - >	1.23	0.033							0.033	0.002	2.54	0	0.181						65.783	65.599	1.64	0.84	A1-5	0, Qg/Qo=0.1	65.84	66.79	0.95	Pit G1	
			Grassed						6.63																													
20	LB\1	0.0876	Paved	0	5				5	0.026					JUNCTION P	0.9 x 0.9 GRA	0.026	0	0	0	0.157	4.676	1.01	375	64.147	64.1	64.864	64.796	1.42	3.11	A1-4	1.5, Vo2/(2gDc	65.18	65.573	0.4	LB\1	
			Supp.	0	0																																	
			Grassed	100	10				10																													
100	LB\1	0.0876	Paved	< - - -	- - - -	as above	- - - -	- - - >	5	0.035							0.035	0	0	0	0.182						65.326	65.252	1.65	2.44	A1-4	2.1, Vo2/(2gDc	65.6	65.573	-0.03	LB\1	
			Grassed						10																													
20	CD\1	0.0102	Paved	90	5				5	0.004	Pit G5	0.009	1.28	0.01	GRATED KEF	1.8m LINTEL	0.016	0	0	0	0.16	59.198	0.5	375	64.059	63.763	64.547	64.225	1.45	2.33	H-O'L	)o=0.08, S/Do	64.8	65.575	0.78	CD\1	
			Supp.	0	0						Pit G4	0.001	0.66	0																								
			Grassed	10	10				10		Pit G3	0.001	0.53	0																								
											Pit G2	0	0	0																								
											Pit G1	0.001	1.95	0																								
100	CD\1	0.0102	Paved	< - - -	- - - -	as above	- - - -	- - - >	5	0.005	Pit G5	0.015	1.58	0.02			0.026	0.001	0.3	0.01	0.181						64.982	64.672	1.64	2.32	H-O'L	)o=0.07, S/Do	65.25	65.575	0.32	CD\1	
			Grassed						10		Pit G4	0.002	0.81	0.01																								
											Pit G3	0.002	0.74	0.01																								
											Pit G2	0	0	0																								
											Pit G1	0.002	2.54	0																								
20	CD\2	0.0703	Paved	90	5				5	0.03	CD\1	0	0	0	GRATED KEF	1.8m LINTEL	0.03	0.003	0.48	0.01	0.179	50	0.5	375	63.733	63.483	64.119	63.793	1.83	0.79	A1-5	0, Qg/Qo=0.1	64.22	65.073	0.85	CD\2	
			Supp.	0	0																																	
			Grassed	10	10				10																													
100	CD\2	0.0703	Paved	< - - -	- - - -	as above	- - - -	- - - >	5	0.038	CD\1	0.001	0.3	0.01			0.039	0.005	0.77	0.02	0.2						64.596	64.274	1.81	0.6	A1-5	0, Qg/Qo=0.1	64.67	65.073	0.4	CD\2	
			Grassed						10																													
20	CD\3	0.0593	Paved	90	5				5	0.025	CD\2	0.003	0.48	0.01	GRATED KEF	1.8m LINTEL	0.028	0.003	0.43	0.01	0.197	49.977	0.5	450	63.453	63.203	63.761	63.569	1.7	0.19	A1-5	3, Qg/Qo=0.1	63.78	64.823	1.04	CD\3	
			Supp.	0	0																																	
			Grassed	10	10				10																													
100	CD\3	0.0593	Paved	< - - -	- - - -	as above	- - - -	- - - >	5	0.032	CD\2	0.005	0.77	0.02			0.037	0.005	0.73	0.02	0.219						64.269	64.121	1.38	0.08	A1-5	3, Qg/Qo=0.1	64.27	64.823	0.55	CD\3	
			Grassed						10																													
20	CD\4	0.0594	Paved	90	5				5	0.025	CD\3	0.003	0.43	0.01	GRATED KEF	1.8m LINTEL	0.028	0.002	0.42	0.01	0.215	50.023	0.5	450	63.173	62.923	63.512	63.397	1.68	0.68	A1-5	0, Qg/Qo=0.1	63.57	64.664	1.1	CD\4	
			Supp.	0	0																																	
			Grassed	10	10				10																													
100	CD\4	0.0594	Paved	< - - -	- - - -	as above	- - - -	- - - >	5	0.032	CD\3	0.005	0.73	0.02			0.037	0.005	0.73	0.02	0.239						64.073	63.899	1.5	0.56	A1-5	0, Qg/Qo=0.1	64.12	64.664	0.54	CD\4	
			Grassed						10																													
20	Low Flow		Paved								Basin E	0	0	0			0	8.791	46.3	0.35	0.466	5	0.5	750	60.725	60.7	62.661	62.646	1.06							Low Flow	
			Supp.																																		
			Grassed																																			
100	Low Flow		Paved	< - - -	- - - -	as above	- - - -	- - - >			Basin E	2.813	10	0.28			2.81299996	13.156	49.99	0.49	0.197						63.15	63.144	0.45							Low Flow	
			Grassed																																		
20	High Flow		Paved								Basin E	0	0	0			0	0.477	16.84	0.05	2.785	19.7	0.49	1200	60.6	60.504	61.817	61.7	2.46							High Flow	
			Supp.																																		
			Grassed																																			
100	High Flow		Paved	< - - -	- - - -	as above	- - - -	- - - >			Basin E	2.813	10	0.28			2.81299996	4.389	35.88	0.22	1.907						62.755	62.7	1.69							High Flow	
			Grassed																																			
20	Basin E	0.2	Paved	0	5				5	0.076	N776089	4.557	36.42	0.23			13.901	0	0	0																	Basin E	
			Supp.	0	0						Low Flow	8.791	46.3	0.35																								
			Grassed	100	5				5		High Flow	0.477	16.84	0.05																								
100	Basin E	0.2	Paved	< - - -	- - - -	as above	- - - -	- - - >	5	0.094	N776069	5.701	39.47	0.27			23.3400002	2.813	10	0.28																	Basin E	
			Grassed						5		Low Flow	13.156	49.99	0.49																								
											High Flow	4.389	35.88	0.22																								

NOTES

This sheet presents results from an ILSAX, extended rational method (ERM) or rational method model implemented in the DRAINS program, (www.watercom.com.au) involving considerable calculations with multiple rainfall patterns, and complex hydraulic computations. Therefore, unlike older rational method calculation sheets, this sheet does not portray hand calculations. It presents the key model inputs and outputs of interest to reviewers.

Depending on inputs, the table may show results for a minor storm, a major storm, or both. There may be multiple rows for up to three overflow routes coming to a pit. You can edit headings or delete columns or rows.

The contents of each column are discussed below:

Column 1: Design average recurrence Interval (years); values for minor storms, major storms or both may be displayed. Numerical values are not available for the rational method, but users can enter these.
Column 2: Pit Name from DRAINS (The connecting sub-catchment, downstream pipe and overflow route are assumed to have similar names, so they do not need to be entered in the table.)
Column 3: Sub-Catchment Area (ha)
Column 4: Land-Use Type: paved, supplementary and grassed areas (in different rows) for ILSAX, or impervious and pervious areas for the ERM
Column 5: Percentages of paved, supplementary and grassed areas for ILSAX, or impervious and pervious areas for ERM
Column 6: Constant flow times for the paved, supplementary and grassed areas (minutes) for ILSAX, or impervious and impervious areas for the ERM
Column 7: Lengths of paved, supplementary and grassed area flow path segments (m) for ILSAX, or impervious and impervious areas for the ERM
Column 8: Slopes of paved, supplementary and grassed area flow path segments (%) for ILSAX, or impervious and impervious areas for the ERM
Column 9: Roughnesses of paved, supplementary and grassed area flow path segments (Manning's values) for ILSAX, or impervious and impervious areas for the ERM
Column 10: Total flow times for the paved, supplementary and grassed areas (minutes) for ILSAX, or impervious and pervious areas for the ERM
For the rational methoid, it is the total catchment time of concentration.
Column 11: Peak Sub-Catchment Flowrate (m^3/s). For the rational method, the output indicates whether this is a full catchment or partial area estimate.
Column 12: Origin of Overflows, the names of any pits or nodes from which overflows come to the pit
Column 13: Peak Overflows from upstream pits or nodes(m3/s), which may include flows from the sub-catchment through which they flow.
- Not outputted for the rational method.)
Column 14: Approach Flow Width (m) - not outputted for the rational method.
Column 15: Approach Flow Depth x Velocity (m^2/s) - not outputted for the rational method
Column 16: Inlet Family, in the DRAINS classification
Column 17: Inlet Size, in the DRAINS classification
Column 18: Total Approach Flow (m^3/s), local sub-catchment runoff plus overflows directed to the pit
Column 19: Bypass Flow (m^3/s), the overflow occurring because of lack of inlet capacity or overflowing of the pipe system
Column 20: Overflow Width (m) just downstream of the pit - not outputted for the rational method; inspect the DRAINS model for this information.
Column 21: Overflow Route Depth x Velocity (m^2/s) just downstream of the pit - not outputted for the rational method; inspect the DRAINS model for this information.
Column 21a: Baseflow or Direct Inflow Peak (m^3/s), if present in the model; otherwise this column does not appear
Column 22: Flow in Pipe (m^3/s)
Column 23: Pipe Length (mm)
Column 24: Pipe Slope (%)
Column 25: Pipe Diameter (mm) or Box Dimensions (m)
Column 28: Upstream Pipe Hydraulic Grade Line Level (inside the pipe) (m AHD)
Column 29: Downstream Pipe Hydraulic Grade Line Level (m AHD)
Column 30: Pipe Flow Velocity (m/s), for full or part flow
Column 31: Pit Pressure Change Coefficient, the Ku value applying to the main line through the pit
Column 31a: Chart Structure Number. If the QUDM method for determining Ku is applied, the number of the Chart in QUDM (2008) that is used to determine pit pressure change K factors is displayed.
If this is given as 'H-O'L' the equations in a paper by Hare and O'Loughlin are used.
Column 31b: Ratios used to define a K value from the appropriate QUDM chart, if teh QUDM method is applied
Column 32: Water Surface Elevation (m AHD)
Column 33: Surface or Kerb and Channel (Kerb and Gutter) Obvert Level (m AHD)
Column 34: Freeboard (m), the difference between the levels in Columns 56 and 55
Column 35: Pit Name (repeated)

7 APPENDIX B – DRAWINGS

NW160231_DAC1.01_A – GENERAL ARRANGEMENT PLAN

NW160231_DAC1.11_A – STORMWATER CATCHMENT PLAN

NW160231_DAC2.01_A – SITE WORKS PLAN SHEET 1 OF 6

NW160231_DAC2.02_A – SITE WORKS PLAN SHEET 2 OF 6

NW160231_DAC2.03_A – SITE WORKS PLAN SHEET 3 OF 6

NW160231_DAC2.04_A – SITE WORKS PLAN SHEET 4 OF 6

NW160231_DAC2.05_A – SITE WORKS PLAN SHEET 5 OF 6

NW160231_DAC2.06_A – SITE WORKS PLAN SHEET 6 OF 6

NW160231_DAC3.01_A – SITEWORK SECTIONS SHEET 1 OF 2

NW160231_DAC3.02_A – SITEWORK SECTIONS SHEET 2 OF 2

NW160231_DAC4.01_A – CONSTRUCTION STAGE PLAN

NW160231_DAC6.01_A – BULK EARTHWORKS STAGE 1 CUT/FILL PLAN

NW160231_DAC6.01_A – VEHICLE TURNING PATH PLAN

NW160231_DAC8.01_A – SOIL AND EROSION CONTROL CONCEPT PLAN