

Revision P2





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APPENDIX B

Stage 3A Stormwater Management Report



Stormwater Management DDR Report Lismore Base Hospital Stage 3a Redevelopment

for Health Infrastructure

SEPTEMBER 2013

121204

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1. APPENDIX A – STORMWATER ANALYSIS

1.0 INTRODUCTION

This stormwater management plan is submitted by Engineering Consultancy firm Taylor Thomson Whitting (TTW) who have been engaged by Health Infrastructure to investigate and design the stormwater for the Lismore Base Hospital Stage 3A redevelopment. The purpose of this plan is to satisfy Lismore City Council's requirements that the proposed development will not have an adverse impact on stormwater runoff for the existing site and the downstream catchment.

2.0 DEVELOPMENT SITE

Lismore Base Hospital is located in Lismore the Health Precinct which is approximately 2km north-east of the city centre. The redevelopment site is situated on the corner of Uralba and Little Uralba Streets and is part of the existing grounds of Lismore Base Hospital.



Figure 1 Development Site

3.0 LOCAL TOPOGRAPHY

The local topography is generally sloping to the north and south from a local ridge at Uralba Street. Contours of the land can be seen on the Lismore City Council Flood Hazard Categories Map in this report. Wilsons River lies to the west and north-west of Lismore Base Hospital.

Uralba Street falls to the west at about 3% grade. Little Uralba Street falls to the north, starting at 6% at the intersection and increasing to 12% adjacent the development site and further increasing to 20% adjacent the Mental health Unit to Fermoy Street.

4.0 PROPOSED DEVELOPMENT

The proposed development includes works as listed following;

- a new five-story building (Stage 3a) at the southeast corner of the site,
- relocation of some community health services back to the hospital campus through internal refurbishment of Block C,
- altered vehicular access on Little Uralba Street for a temporary service yard at Level 3 north of the new building,
- new vehicular access on Little Uralba Street at Level 4 to serve the proposed mortuary,
- front entry improvements including ambulance and ambulatory access and road reservation realignment,
- earthworks cut for the new building and service yard,
- stormwater drainage re-routing, on-site detention storage and water quality treatment,
- Coordination of overland flow paths with building entry points and pedestrian zones,
- Coordination with service routes and future development stages.



Figure 2 Site Plan

5.0 FLOOD RISK

The majority of the Lismore Base Hospital site is located outside of the Lismore City Council Flood Risk Area, but the northeast corner of the site (existing car park at grade and under the Mental Health Unit) is located within the Low Flood Risk Area which is defined in Chapter 8 – Flood Prone Lands of the Council Development Control Plan (DCP) as area within the limits of the Probable Maximum Flood (PMF), but outside of the limits of the 1 in 100 year Annual Recurrence Interval (ARI) flood level.



Figure 8 – Lismore City Council Flood Hazard Categories Map

The proposed Stage 3A development area is outside of the Council mapped Flood Risk Area as shown on the map above.

6.0 HYDROLOGY AND ON-SITE STORMWATER DETENTION

The Hospital falls from southeast to northwest and can be divided into five catchments. The Block H/T catchment currently drains via a 450m diameter pipe under Mental Health Block X and an overland flow path around the south and east sides of Block X to the intersection of Fermoy Avenue and Weaver Street. The other four hospital catchments have pipe connections to the Council system in Hunter Street with overland flow to Uralba Street and Hunter Street.

In previous discussions, Council advised that they are not aware of any localised drainage issues on the site currently. Council noted that localized drainage issues do occur downstream of the hospital site at the intersection of Hunter Street and Orion Street. The proposed hospital redevelopment will reduce or maintain stormwater flows for the 1-year through to the 100-year ARI storm events and will have no negative downstream impact.



PRE-DEVELOPMENT CATCHMENT

Figure 4 – Pre-Development Catchment Plan



Figure 5 – Post-Development Catchment Plan

The proposed development requires management of the overland flow paths particularly at the ambulatory entry precinct, the service yard and in an existing trapped catchment bounded by existing Blocks A, C, and J.

The stormwater for the ambulatory entry is managed by a piped system and overland flow paths to the southwest.

The service yard is served by a primary piped system with 100 year capacity running under Mental Health Block X to the intersection of Weaver Street and Fermoy Avenue. In addition, an overland flow path exists around Mental Health Block X.

The existing trapped catchment is currently served by a piped system under Block A. As a risk management treatment, a piped overflow system which has 100 year capacity is recommended under the proposed main building. This system is proposed to function as the primary system with the existing system under Block A acting as a reliever in the case of blockage.



Figure 6 – Existing Trapped Catchment

In Phase 3A, stormwater detention and water quality treatment will be required for the Block H/T catchment due to the proposed increase in existing impervious area and increase in the catchment contributing area (contributing area increase is due to transfer of Stage 3A building area from Main Hospital catchment to Block H/T catchment). The detention required is about 88 cu.m.

Other catchments within the LBH site are not impacted by the proposed development.

6.1 Catchment Comparison

A comparison of the pre and post-development catchments has been made to ensure that any impacts of flow into the pipe connections to Council's system are addressed as part of the stormwater management. A comparison of the catchments is shown in the table following.

Catchment	Pre-Development Area m ²	Post Development Area m ²	% Change
Block H/T	3730	6,100	+63.5
Main Hospital	11100	8600	-22.5
Corner	920	920	0
ICC	4300	4300	0
MHU	12830	12830	0

Table 1 Catchment Comparison Following Development

6.2 On-site Stormwater Detention

On-site stormwater detention will be provided within the Block H/T catchment for Stage 3A.

An in-ground tank is proposed with an orifice outlet as the discharge control. The tank has been designed and analysed using DRAINS to ensure that the Permissible Site Discharge (PSD) does not

exceed the pre-developed flows for all storm events from the 1 to 100-year ARI. Design has been carried in accordance with the Council's Development Control Plan (DCP) and Northern Rivers Local Government Handbook of Stormwater Drainage Design.

The DRAINS analysis and results is attached in Appendix A. Summary of the results is tabulated following.

Storm Event	Pre-developed catchment flow = PSD (cu.m/s)
1 year ARI	0.104
5 year ARI	0.170
20 year ARI	0.217
100 year ARI	0.260

Table 2 Block H/T Catchment PSD

The "Main Hospital" catchment is reduced in area; therefore the flows to the pipe connection to Council's system will be reduced. On-site stormwater detention will not be provided for this catchment.

Corner, ICC and MHU catchments are outside the area of development.

7.0 WATER SENSITIVE URBAN DESIGN

In addition to stormwater detention, stormwater quality control filtering such as oil and silt traps will be required prior to discharge from impervious areas. As compared to baseline, Council's Water Sensitive Design DCP requires the following reduction in mean annual pollutant loading:

- 75% reduction in Total Suspended Solids (TSS)
- 65% reduction in Total Phosphorus (TP)
- 40% reduction in Total Nitrogen (TN)
- 90% reduction in Gross Pollutants (GP)

Council's "Deemed to Comply" water quality treatment solution in the DCP is 1.8% of the site area to be set aside for bio retention. This would be about 600 sq.m for the hospital site. To maximize developable area, TTW recommend a treatment train consisting of the OSD tank, OSD trash rack, a Humeceptor and 3xSPEL Filters.

MUSIC modelling has been carried to design the treatment train and results showing compliance with Council's pollutant loading reduction targets are shown in the following figure.



Figure 3 MUSIC Model Results

7.1 Erosion and Sediment Control

TTW have prepared a schematic Erosion and Sediment Control plan for the project in accordance with *Managing Urban Stormwater – Soils & Construction Volume 1 2004 (Landcom).*

8.0 STORMWATER RUNOFF ANALYSIS

The proposed stormwater system for the Stage 3a building and surrounds will consist of a pit and pipe system. Existing drainage paths across the site have been maintained in coordination with the proposed works.

For each catchment, stormwater runoff has been analysed using DRAINS for the 20 and 100-year ARI, with multiple storm durations between 5 and 120 minutes. The proposed OSD tank has been analysed for the 1 to 100-year ARI storm events.

Full calculations and results from DRAIN model are included in Appendix A.

9.0 SUMMARY OF DEVELOPMENT IMPACT

The proposed development alters the catchment characteristics as detailed in this report and on the engineering drawings.

As part of the stormwater management controls will be implemented to ensure that;

The peak runoff from the site is not increased.

The risk of downstream and on-site flooding is reduced

The quality of the stormwater runoff is improved.

Prepared by: TAYLOR THOMSON WHITTING (NSW) PTY LTD

Heather Spencer Senior Civil Engineer

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Authorised by: TAYLOR THOMSON WHITTING (NSW) PTY LTD

Stephen Brain Technical Director

APPENDIX A – STORMWATER ANALYSIS

PRE-DEVELOPMENT FROM BLOCK H/T



Calculation of predevelopment flows to determine PSD

DRAINS RESULTS

SUB-CATCHMEN	T DETAILS											
Name	Max	Paved Grassed Paved Grassed		Supp.	pp. Due to Storm							
	Flow Q	Max Q	Max Q	Тс	Тс	Тс						
	(cu.m/s)	(cu.m/s)	(cu.m/s)	(min)	(min)	(min)						
Block HT Extg	0.104	0.077	0.027	5.5	5.5	5.5	AR&R 1 year, 25 minutes storm, average 57.4 mm/h, Zone 1					
Block HT Extg	0.170	0.122	0.048	5.5	5.5	5.5	AR&R 5 ye	ear, 25 min	utes storm	, average 9	91.5 mm/h,	, Zone 1
Block HT Extg	0.217	0.155	0.063	5.5	5.5	5.5	AR&R 20 year, 25 minutes storm, average 115.5 mm/h, Zone 1				/h, Zone 1	
Block HT Extg	g 0.260 0.185 0.075 5.5 5.5		5.5	AR&R 100	year, 15 m	inutes sto	rm, averag	e 191 mm/	h, Zone 1			





DRAINS results prepared 11 July, 2013 from Version 2013.06														
PIT / NODE DETAILS	Max HGL	Max Pond	Max Surface	Version 8 Max Pond	N 6 m	Overflerv	Constrair		_					
Name	IVIAX FIGE	HGL	Flow Arriving	Volume	Min Freeboar	c (cu.m/s)	Constrair							
		1102	(cu.m/s)	(cu.m)	(m)	c (cu.iii, 5)								
Pit10	26.98	27.18	0.016	1.6	0.12	0	Inlet Cap							
Pit9	26.98	27.11	0.007	0.1	0.12	0	Inlet Cap	acity	_					
Pit8 Pit7	26.86 26.78		0		0.42	0	None None		-	_				
Pit6	26.63		0		0.59	0	None							
Pit2 GPT	25.3		0		1.85		None							
Pit1 GPT	25.09		0		1.91		None							
N747	23.42		0											
Pit15	30.52	31.36	0.001	0.1	0.83		Inlet Cap		_					
Pit14 Pit13	30.37 30.29	31.36 31.4	0.001 0.004	0.1	0.98		Inlet Cap Inlet Cap		-					
Pit12	30.18	31.37	0.004		1.17		Inlet Cap							
Pit11	29.3	31.37	0.003	0.3	2.05		Inlet Cap							
Pit22	26.75	26.89	0.037	0.6	0.05	0	Inlet Cap	acity						
Pit21	26.73	27.09	0.014	0.3	0.32		Inlet Cap	acity						
Pit 16	26.71	_	0		0.49		None		_					
Pit23 Pit18	27.61 27.58	_	0.003		0.89 2.12	0	None None		-					
Pit 17	26.78		0		0.47	0	None							
Pit42	30.9		0.056		1.6	0.01	Inlet Cap	acity						
Pit41	30.72		0.025		1.18	0.006	Inlet Cap	acity						
N745	30.65		0.006						_					
Pit51	33.69		0.03		0.41	0.007	Inlet Cap							
Pit50 N742	33.69		0.017		0.01	0.009	Inlet Cap	acity				-		
N /42 Pit57	33.35 34.73		0 0.01		1.39	-	None	-				1	-	
Pit56	34.2		0.016		1.5	0.001	Inlet Cap	acity				1		
Pit55	34.06		0.034		1.44	0.004	Inlet Cap							
Pit54	34.04		0.038		1.46	0.005	Inlet Cap	acity						
Pit53	33.98		0.019		1.12	0.003	Inlet Cap					1		
Pit52	33.86		0.016		0.59	0.002	Inlet Cap	acity					-	
Ex31 N30	31.61 31.6		0.004		0.19		None	-	-			-	-	
Pit32	31.09	31.9	0.009	0.9	0.78	0	Inlet Cap	acitv		\rightarrow			1	
Pit33	30.95	31.89	0.006	0.8	0.92	0	Inlet Cap							
Pit34	30.83	31.9	0.007	1	1.04	0	Inlet Cap	acity						
Pit35	30.72	31.89	0.006	0.9	1.15	0	Inlet Cap		_					
Pit36	30.59	31.9	0.004	0.8	1.29	0	Inlet Cap	acity	_					
NRoof4&2 Pit20A	35.02 34.57		0.085		0.83		None			_				
Pit20	32.17		0.007		1.33		None		-					
Pit19	29.68		0.009		1.32	0.002	Inlet Cap	acity						
NRoof 1	26.8		0.022											
NRoof3	30.65		0.053											
SUB-CATCHMENT DETAILS Name	Max	Paved	Grassed	Paved	Grassed	Supp	Due to St	orm						
Name	Flow Q	Max Q	Max Q	Тс	Tc	Supp. Tc	Due to st	onn				-		
			max q	10		(min)								
	(cu.m/s)	(cu.m/s)	(cu.m/s)	(min)	(min)									
Cat10	(cu.m/s) 0.016	(cu.m/s) 0.016	(cu.m/s) 0	(min) 0.52	(min) 0	0	AR&R 20	year, 25	ninutes	storm	, averag	e 115.5 mn	n/h, Zone 1	
Cat9	0.016 0.007	0.016 0.007	0 0	0.52 0.58	0 0	0 0	AR&R 20	year, 25	ninutes	storm	, averag	e 115.5 mn	n/h, Zone 1	
Cat9 Cat4	0.016 0.007 0.017	0.016 0.007 0.017	0 0 0	0.52 0.58 1.06	0 0 0	0 0 0	AR&R 20 AR&R 20	year, 25 year, 25	ninutes ninutes	storm storm	ı, averagı ı, averag	e 115.5 mn e 115.5 mn	n/h, Zone 1 n/h, Zone 1	
Cat9 Cat4 Cat15	0.016 0.007 0.017 0.001	0.016 0.007 0.017 0.001	0 0 0 0	0.52 0.58 1.06 0.82	0 0 0 0	0 0 0 0	AR&R 20 AR&R 20 AR&R 20	year, 25 year, 25 year, 25	ninutes ninutes ninutes	storm storm storm	ı, averag ı, averag ı, averag	e 115.5 mn e 115.5 mn e 115.5 mn	n/h, Zone 1 n/h, Zone 1 n/h, Zone 1	
Ca19 Ca14 Ca115 Ca114	0.016 0.007 0.017 0.001 0.001	0.016 0.007 0.017 0.001 0.001	0 0 0 0 0	0.52 0.58 1.06 0.82 0.69	0 0 0 0 0	0 0 0 0 0	AR&R 20 AR&R 20 AR&R 20 AR&R 20	year, 25 year, 25 year, 25 year, 25	ninutes ninutes ninutes ninutes	storm storm storm storm	n, averag n, averag n, averag n, averag n, averag	e 115.5 mn e 115.5 mn e 115.5 mn e 115.5 mn	n/h, Zone 1 n/h, Zone 1 n/h, Zone 1 n/h, Zone 1	
Cat9 Cat4 Cat15	0.016 0.007 0.017 0.001	0.016 0.007 0.017 0.001	0 0 0 0	0.52 0.58 1.06 0.82	0 0 0 0	0 0 0 0	AR&R 20 AR&R 20 AR&R 20 AR&R 20 AR&R 20	year, 25 year, 25 year, 25 year, 25 year, 25	ninutes ninutes ninutes ninutes ninutes	storm storm storm storm storm	n, averag n, averag n, averag n, averag n, averag n, averag	e 115.5 mn e 115.5 mn e 115.5 mn e 115.5 mn e 115.5 mn	n/h, Zone 1 n/h, Zone 1 n/h, Zone 1 n/h, Zone 1 n/h, Zone 1	
Ca19 Ca14 Ca115 Ca114 Ca113	0.016 0.007 0.017 0.001 0.001 0.004	0.016 0.007 0.017 0.001 0.001 0.001 0.004	0 0 0 0 0 0	0.52 0.58 1.06 0.82 0.69 1.03	0 0 0 0 0 0	0 0 0 0 0 0	AR&R 20 AR&R 20 AR&R 20 AR&R 20 AR&R 20 AR&R 20	year, 25 year, 25 year, 25 year, 25 year, 25 year, 25	ninutes ninutes ninutes ninutes ninutes ninutes	storm storm storm storm storm	n, averag n, averag n, averag n, averag n, averag n, averag	e 115.5 mn e 115.5 mn e 115.5 mn e 115.5 mn e 115.5 mn e 115.5 mn	n/h, Zone 1 n/h, Zone 1 n/h, Zone 1 n/h, Zone 1	
Ca19 Ca14 Ca115 Ca114 Ca113 Ca112 Ca112 Ca111 Ca122	0.016 0.007 0.017 0.001 0.001 0.004 0.004 0.003 0.037	0.016 0.007 0.017 0.001 0.001 0.004 0.004 0.004 0.003 0.003	0 0 0 0 0 0 0 0 0 0 0	0.52 0.58 1.06 0.82 0.69 1.03 0.82 0.53 1.37	0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0	AR&R 20 AR&R 20 AR&R 20 AR&R 20 AR&R 20 AR&R 20 AR&R 20 AR&R 20 AR&R 20	year, 25 year, 25 year, 25 year, 25 year, 25 year, 25 year, 25 year, 25	minutes minutes minutes minutes minutes minutes minutes minutes	storm storm storm storm storm storm storm	n, averag n, averag n, averag n, averag n, averag n, averag n, averag n, averag	e 115.5 mn e 115.5 mn	n/h, Zone 1 n/h, Zone 1	
Cat9 Cat4 Cat15 Cat14 Cat13 Cat12 Cat11 Cat22 Cat21 Cat21	0.016 0.007 0.017 0.001 0.001 0.004 0.004 0.003 0.003 0.037 0.014	0.016 0.007 0.017 0.001 0.001 0.004 0.004 0.004 0.003 0.037 0.014	0 0 0 0 0 0 0 0 0 0 0	0.52 0.58 1.06 0.82 0.69 1.03 0.82 0.53 1.37 0.92	0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0	AR&R 20 AR&R 20 AR&R 20 AR&R 20 AR&R 20 AR&R 20 AR&R 20 AR&R 20 AR&R 20	year, 25 year, 25 year, 25 year, 25 year, 25 year, 25 year, 25 year, 25 year, 25	minutes minutes minutes minutes minutes minutes minutes minutes	storm storm storm storm storm storm storm	n, averag n, averag n, averag n, averag n, averag n, averag n, averag n, averag n, averag n, averag	e 115.5 mn e 115.5 mn	n/h, Zone 1 n/h, Zone 1	
Ca19 Ca14 Ca15 Ca114 Ca113 Ca112 Ca111 Ca112 Ca111 Ca122 Ca121 Ca121 Ca123	0.016 0.007 0.017 0.001 0.001 0.004 0.004 0.003 0.037 0.014 0.003	0.016 0.007 0.007 0.001 0.001 0.004 0.004 0.003 0.037 0.014 0.003	0 0 0 0 0 0 0 0 0 0 0 0	0.52 0.58 1.06 0.82 0.69 1.03 0.82 0.53 1.37 0.92 0.83	0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0	AR&R 20 AR&R 20	year, 25 year, 25	ninutes ninutes ninutes ninutes ninutes ninutes ninutes ninutes ninutes ninutes	storm storm storm storm storm storm storm storm	n, averag n, averag n, averag n, averag n, averag n, averag n, averag n, averag n, averag n, averag	e 115.5 mn e 115.5 mn	n/h, Zone 1 n/h, Zone 1	
Ca19 Ca14 Ca15 Ca114 Ca113 Ca113 Ca112 Ca112 Ca121 Ca121 Ca121 Ca123 Ca121 Ca123 Ca124	0.016 0.007 0.017 0.001 0.001 0.004 0.004 0.003 0.037 0.014 0.003 0.003 0.004	0.016 0.007 0.017 0.001 0.001 0.004 0.003 0.003 0.037 0.014 0.003 0.004	0 0 0 0 0 0 0 0 0 0 0 0 0 0	0.52 0.58 1.06 0.82 0.69 1.03 0.82 0.53 1.37 0.92 0.83 2.55	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0	AR&R 20 AR&R 20	year, 25 year, 25	ninutes ninutes ninutes ninutes ninutes ninutes ninutes ninutes ninutes ninutes	storm storm storm storm storm storm storm storm storm	II, averagi II, averagi	e 115.5 mn e 115.5 mn	n/h, Zone 1 n/h, Zone 1	
Ca19 Ca14 Ca15 Ca114 Ca113 Ca112 Ca111 Ca112 Ca111 Ca122 Ca121 Ca121 Ca123	0.016 0.007 0.017 0.001 0.001 0.004 0.004 0.003 0.037 0.014 0.003	0.016 0.007 0.007 0.001 0.001 0.004 0.004 0.003 0.037 0.014 0.003	0 0 0 0 0 0 0 0 0 0 0 0	0.52 0.58 1.06 0.82 0.69 1.03 0.82 0.53 1.37 0.92 0.83	0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	AR&R 20 AR&R 20	year, 25 year, 25	ninutes ninutes ninutes ninutes ninutes ninutes ninutes ninutes ninutes ninutes ninutes ninutes	storm storm storm storm storm storm storm storm storm storm	II, averagi II, averagi	e 115.5 mn e 115.5 mn	n/h, Zone 1 n/h, Zone 1	
Ca19 Ca14 Ca14 Ca115 Ca114 Ca113 Ca12 Ca121 Ca121 Ca121 Ca123 Ca123 Ca124 Ca141 Ca151 Ca151 Ca150	0.016 0.007 0.007 0.001 0.001 0.004 0.004 0.003 0.003 0.014 0.003 0.014 0.003 0.04 0.015 0.025 0.015	0.016 0.007 0.017 0.001 0.001 0.004 0.004 0.003 0.037 0.014 0.003 0.037 0.014 0.003 0.04 0.005 0.025 0.015	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0.52 0.58 1.06 0.82 0.69 1.03 0.82 0.53 1.37 0.92 0.83 2.55 2.06	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	AR&R 20 AR&R 20	year, 25 year, 25	ninutes ninutes ninutes ninutes ninutes ninutes ninutes ninutes ninutes ninutes ninutes ninutes ninutes ninutes	storm storm storm storm storm storm storm storm storm storm storm	II, averag II, averag	e 115.5 mm e 115.5 mm	n/h, Zone 1 n/h, Zone 1	
Ca19 Ca14 Ca14 Ca115 Ca114 Ca13 Ca12 Ca11 Ca12 Ca12 Ca121 Ca123 Ca142 Ca141 Ca151 Ca150 Ca157	0.016 0.007 0.017 0.001 0.001 0.004 0.003 0.003 0.003 0.003 0.014 0.003 0.04 0.003 0.04 0.015 0.015	0.016 0.007 0.017 0.001 0.001 0.004 0.004 0.004 0.003 0.014 0.003 0.014 0.003 0.04 0.003 0.015 0.015 0.015 0.015	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0.52 0.58 1.06 0.69 1.03 0.82 0.53 1.37 0.92 0.92 2.05 2.06 2.65 2.06 1.64	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	AR&R 20 AR&R 20	year, 25 year, 25	ninutes ninutes ninutes ninutes ninutes ninutes ninutes ninutes ninutes ninutes ninutes ninutes ninutes ninutes	storm storm storm storm storm storm storm storm storm storm storm storm	II, averag II, averag	e 115.5 mm e 115.5 mm	n/h, Zone 1 n/h, Zone 1	
Ca19 Ca14 Ca14 Ca113 Ca114 Ca113 Ca112 Ca111 Ca122 Ca111 Ca122 Ca121 Ca123 Ca124 Ca124 Ca123 Ca124 Ca125 Ca150 Ca156 Ca157 Ca156 Ca157 Ca156 Ca156 Ca157 Ca156 Ca156 Ca156 Ca156 Ca156 Ca157 Ca156 Ca156 Ca156 Ca156 Ca156 Ca156 Ca156 Ca156 Ca157	0.016 0.007 0.017 0.001 0.001 0.004 0.004 0.003 0.037 0.014 0.003 0.037 0.014 0.005 0.025 0.015 0.012 0.011 0.011 0.011 0.011 0.003 0.003 0.017 0.017 0.017 0.001 0.003 0.003 0.003 0.004 0.004 0.003 0.004 0.003 0.004 0.004 0.004 0.003 0.004 0.004 0.004 0.004 0.004 0.004 0.003 0.004 0.004 0.004 0.004 0.004 0.004 0.004 0.004 0.004 0.004 0.004 0.004 0.004 0.004 0.005 0.005 0.014 0.015 0.	0.016 0.007 0.001 0.001 0.001 0.004 0.004 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.004 0.005 0.015 0.015 0.015 0.015 0.015 0.015 0.015 0.015 0.015	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0.52 0.58 1.06 0.82 0.69 1.03 0.82 0.53 1.37 0.92 0.83 2.55 2.06 2.55 2.06 2.55 2.06 2.55 2.06 2.55	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	AR&R 20 AR&R 20	year, 25 year, 25	ninutes ninutes ninutes ninutes ninutes ninutes ninutes ninutes ninutes ninutes ninutes ninutes ninutes ninutes	storm storm storm storm storm storm storm storm storm storm storm storm	II, average II, average	e 115.5 mm e 115.5 mm	n/h, Zone 1 n/h, Zone 1	
Cat9 Cat4 Cat4 Cat15 Cat14 Cat12 Cat12 Cat21 Cat21 Cat21 Cat21 Cat23 Cat42 Cat41 Cat51 Cat50 Cat57 Cat56 Cat55	0.016 0.007 0.001 0.001 0.001 0.001 0.004 0.003 0.037 0.014 0.003 0.04 0.025 0.015 0.015 0.016 0.034	0.016 0.007 0.001 0.001 0.001 0.001 0.004 0.003 0.004 0.003 0.037 0.014 0.003 0.04 0.003 0.04 0.015 0.025 0.015 0.015 0.015 0.015 0.015 0.015	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0.52 0.58 1.06 0.82 0.69 1.03 0.82 0.53 1.37 0.92 0.83 2.55 2.06 1.64 2.55 2.05 2.55 2.33	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	AR&R 20 AR&R 20	year, 25 year, 25	ninutes ninutes ninutes ninutes ninutes ninutes ninutes ninutes ninutes ninutes ninutes ninutes ninutes ninutes ninutes	storm storm storm storm storm storm storm storm storm storm storm storm storm	II, average II, average	e 115.5 mm e 115.5 mm	n/h, Zone 1 1/h, Zone 1	
Ca19 Ca14 Ca14 Ca113 Ca114 Ca113 Ca112 Ca111 Ca122 Ca121 Ca123 Ca124 Ca123 Ca141 Ca151 Ca155 Ca155 Ca154 Ca154 Ca154 Ca154 Ca154 Ca155 Ca154 Ca155 Ca154 Ca155 Ca154 Ca155 Ca154 Ca154 Ca154 Ca154 Ca155 Ca154 Ca155 Ca154 Ca155 Ca154 Ca155 Ca154 Ca155 Ca154 Ca155 Ca154 Ca155 Ca154 Ca154 Ca154 Ca154 Ca154 Ca154 Ca154 Ca154 Ca154 Ca154 Ca154 Ca154 Ca154 Ca154 Ca154 Ca154 Ca154 Ca155 Ca155 Ca154	0.016 0.007 0.007 0.001 0.001 0.004 0.004 0.004 0.003 0.037 0.014 0.003 0.037 0.014 0.003 0.015 0.015 0.015 0.015 0.015 0.015 0.015 0.015	0.016 0.007 0.001 0.001 0.001 0.004 0.004 0.004 0.003 0.037 0.014 0.003 0.037 0.015 0.025 0.015 0.015 0.016 0.034	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0.52 0.58 1.06 0.82 0.69 1.03 0.82 0.53 1.37 0.92 0.83 2.55 2.06 2.55 2.06 1.64 2.3 3.67	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	AR&R 20 AR&R 20	year, 25 year, 25	ninutes ninutes ninutes ninutes ninutes ninutes ninutes ninutes ninutes ninutes ninutes ninutes ninutes ninutes ninutes ninutes	storm storm storm storm storm storm storm storm storm storm storm storm storm storm	II, averagi II, averagi	e 115.5 mn e 115.5 mn	1/h, Zone 1 1/h, Zone 1	
Cat9 Cat4 Cat4 Cat15 Cat14 Cat12 Cat12 Cat21 Cat21 Cat21 Cat21 Cat23 Cat42 Cat41 Cat51 Cat50 Cat57 Cat56 Cat55	0.016 0.007 0.001 0.001 0.001 0.001 0.004 0.003 0.037 0.014 0.003 0.04 0.025 0.015 0.015 0.016 0.034	0.016 0.007 0.001 0.001 0.001 0.001 0.004 0.003 0.004 0.003 0.037 0.014 0.003 0.04 0.003 0.04 0.015 0.025 0.015 0.015 0.015 0.015 0.015 0.015	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0.52 0.58 1.06 0.82 0.69 1.03 0.82 0.53 1.37 0.92 0.83 2.55 2.06 1.64 2.55 2.05 2.55 2.33	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	AR&R 20 AR&R 20	year, 25 year, 25	ninutes ninutes ninutes ninutes ninutes ninutes ninutes ninutes ninutes ninutes ninutes ninutes ninutes ninutes ninutes ninutes ninutes	storm storm storm storm storm storm storm storm storm storm storm storm storm storm	II, averagi II, averagi	e 115.5 mm e 115.5 mm	n/h, Zone 1 1/h, Zone 1	
Ca19 Ca14 Ca14 Ca113 Ca114 Ca113 Ca112 Ca111 Ca122 Ca121 Ca123 Ca124 Ca123 Ca142 Ca141 Ca155 Ca155 Ca155 Ca155 Ca153 Ca152 Ca153 Ca152 Ca152 Ca152 Ca153 Ca152 Ca152 Ca153 Ca152	0.016 0.007 0.001 0.001 0.001 0.004 0.004 0.004 0.003 0.037 0.014 0.003 0.037 0.015 0.025 0.015 0.015 0.015 0.015 0.016 0.034 0.034 0.034	0.016 0.007 0.001 0.001 0.001 0.001 0.004 0.004 0.003 0.037 0.014 0.003 0.037 0.015 0.015 0.015 0.015 0.015 0.016 0.034 0.034 0.034 0.039 0.019 0.014 0.004	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0.52 0.58 1.06 0.82 0.69 1.03 0.82 0.53 0.82 0.53 0.82 0.53 0.83 2.55 2.06 2.55 2.06 1.64 2.3 3.67 2.06 1.88 0.92	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	AR&R 20 AR&R 20	year, 25 year, 25	ninutes ninutes	storm storm storm storm storm storm storm storm storm storm storm storm storm storm storm storm	II, average II, average III, average II,	e 115.5 mm e 115.5 mm	\/h, Zone 1 \/h, Zone 1	
Cat9 Cat4 Cat15 Cat14 Cat13 Cat12 Cat11 Cat22 Cat21 Cat23 Cat44 Cat55 Cat55 Cat54 Cat52 Cat53 Cat54 Cat52 Cat53 Cat54 Cat52 Cat31 Cat32	0.016 0.007 0.001 0.001 0.001 0.004 0.004 0.004 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.025 0.015 0.015 0.015 0.016 0.034 0.034 0.034 0.034 0.015	0.016 0.007 0.001 0.001 0.001 0.004 0.004 0.003 0.003 0.003 0.003 0.003 0.003 0.004 0.003 0.004 0.003 0.004 0.015 0.014 0.015 0.015 0.015 0.015 0.014 0.015 0.	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0.52 0.58 1.06 0.82 0.69 1.03 0.82 0.53 1.37 0.92 0.83 2.55 2.06 1.64 2.3 2.35 2.33 3.67 2.06 1.88 0.92 1.67	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	AR&R 20 AR&R 20	year, 25 25 29 29 29 29 29 29 29 29 29 29 29 29 29	ninutess ninutess	storm storm	 average 	e 115.5 mm e 115.5 mm	1/h, Zone 1 1/h, Zone 1	
Cat9 Cat4 Cat15 Cat14 Cat13 Cat12 Cat11 Cat22 Cat21 Cat23 Cat44 Cat55 Cat56 Cat53 Cat52 Cat53 Cat52 Cat53 Cat52 Cat53 Cat52 Cat31 Cat32	0.016 0.007 0.017 0.001 0.001 0.004 0.004 0.004 0.003 0.037 0.014 0.003 0.015 0.015 0.015 0.015 0.016 0.034 0.034 0.034 0.034 0.019 0.004 0.004	0.016 0.007 0.017 0.001 0.001 0.004 0.004 0.004 0.003 0.014 0.003 0.014 0.003 0.04 0.015 0.025 0.015 0.015 0.016 0.034 0.035 0.019 0.019 0.019 0.019 0.019 0.019 0.019 0.015 0.015 0.015 0.019 0.014 0.004 0.004 0.006 0.007 0.0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0.52 0.58 1.06 0.69 1.03 0.82 0.53 1.37 0.92 0.83 2.55 2.06 2.55 2.06 1.64 2.3 3.67 2.65 1.64 2.3 1.64 2.3 1.64 2.3 2.06 1.64 2.3 2.06 1.64 2.3 2.06 2.164 2.3 2.06 2.164 2.3 2.06 2.164 2	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	AR&R 20 AR&R 20	year, 25 29 year,	minutes minutes	storm storm	II, averagi I, av	e 115.5 mm e 115.5 mm	1/h, Zone 1 1/h, Zone 1	
Cat9 Cat4 Cat15 Cat14 Cat13 Cat12 Cat11 Cat2 Cat2 Cat2 Cat3 Cat44 Cat50 Cat54 Cat55 Cat54 Cat55 Cat54 Cat55 Cat54 Cat53 Cat52 Cat31 Cat32 Cat34 Cat34 Cat34 Cat34 Cat34 Cat34	0.016 0.007 0.001 0.001 0.001 0.004 0.004 0.003 0.003 0.003 0.003 0.003 0.014 0.015 0.025 0.015 0.025 0.015 0.015 0.016 0.034 0.019 0.016 0.034 0.019 0.017	0.016 0.007 0.001 0.001 0.001 0.004 0.004 0.003 0.037 0.014 0.003 0.037 0.014 0.015 0.025 0.015 0.015 0.016 0.034 0.016 0.034 0.019 0.016 0.034 0.019 0.015 0.034 0.015 0.015 0.034 0.015 0.034 0.034 0.015 0.034 0.034 0.034 0.034 0.015 0.034 0.034 0.034 0.034 0.015 0.034 0.034 0.034 0.015 0.034 0.034 0.034 0.034 0.015 0.034 0.009 0.009 0.009 0.009 0.009 0.009 0.009 0.009 0.009 0.009 0.009 0.009 0.009 0.009 0.009 0.009 0.009 0.009 0.009 0.000 0.009 0.009 0.000 0.009 0.000 0.009 0.000 0.009 0.000 0.009 0.000 0.009 0.000 0.009 0.000	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0.52 0.58 1.06 0.82 0.69 1.03 0.82 0.53 1.37 0.92 0.83 2.55 2.06 2.55 2.06 1.64 2.3 2.3 3.67 2.06 1.88 1.88 1.88 1.89 1.69 2.16 2.16 2.16 2.16 2.16 2.16 2.16 2.16	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	AR&R 20 AR&R 2	year, 25 29 year,	ninutes ninutes	storm storm	a, average, a,	e 115.5 mm e 115.5 mm	1/h, 2one 1 1/h, 2one 1	
Cat9 Cat4 Cat15 Cat14 Cat13 Cat12 Cat21 Cat22 Cat21 Cat22 Cat3 Cat44 Cat55 Cat54 Cat55 Cat52 Cat33 Cat32 Cat33 Cat34 Cat35 Cat34 Cat35 Cat34 Cat34 Cat34 Cat34 Cat34 Cat34 Cat34 Cat34 Cat35	0.016 0.007 0.001 0.001 0.001 0.004 0.004 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.004 0.003 0.005 0.015 0.015 0.015 0.015 0.017 0.017 0.017 0.017 0.017 0.004 0.004 0.003 0.004 0.003 0.004 0.004 0.003 0.004 0.003 0.004 0.003 0.003 0.003 0.004 0.003 0.004 0.003 0.003 0.004 0.003 0.015 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.019 0.019 0.019 0.014 0.003 0.019 0.010 0.010 0.010 0.010 0.010 0.003 0.003 0.010 0.009 0.009 0.000 0.009 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0	0.016 0.007 0.001 0.001 0.001 0.004 0.004 0.003 0.003 0.003 0.003 0.003 0.003 0.003 0.004 0.003 0.003 0.004 0.005 0.016 0.034 0.015 0.016 0.015 0.016 0.015 0.016 0.015 0.016 0.016 0.015 0.016 0.009 0.009 0.006 0.009 0.006 0.009 0.006 0.006 0.009 0.006 0.006 0.006 0.006 0.009 0.006 0.007 0.006 0.007 0.006 0.007 0.007 0.007 0.007 0.006 0.007 0.	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0.52 0.58 1.06 0.82 0.69 1.03 0.82 0.53 1.37 0.92 0.83 2.55 2.06 1.64 2.3 2.35 2.33 3.67 2.26 1.88 0.92 1.67 1.67 1.01 0.64	0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	AR&R 20 AR&R 2	year, 25 29 year,	ninutes ninutes	storm storm	5, 3, 4, 3, 3, 4, 3, 4, 4, 4, 4, 5, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4,	e 115.5 mm e 115.5 mm	1/h, Zone 1 1/h, Zone 1	
Cat9 Cat4 Cat15 Cat14 Cat13 Cat12 Cat11 Cat2 Cat2 Cat2 Cat3 Cat44 Cat50 Cat54 Cat55 Cat54 Cat55 Cat54 Cat55 Cat54 Cat53 Cat52 Cat31 Cat32 Cat34 Cat34 Cat34 Cat34 Cat34 Cat34	0.016 0.007 0.001 0.001 0.001 0.004 0.004 0.003 0.003 0.003 0.003 0.003 0.014 0.015 0.025 0.015 0.025 0.015 0.015 0.016 0.034 0.019 0.016 0.034 0.019 0.017	0.016 0.007 0.001 0.001 0.001 0.004 0.004 0.003 0.037 0.014 0.003 0.037 0.014 0.015 0.025 0.015 0.015 0.016 0.034 0.016 0.034 0.019 0.016 0.034 0.019 0.015 0.034 0.015 0.015 0.034 0.015 0.034 0.034 0.015 0.034 0.034 0.034 0.034 0.034 0.034 0.034 0.034 0.034 0.015 0.034 0.034 0.034 0.034 0.015 0.034 0.034 0.034 0.034 0.015 0.034 0.009 0.000 0.	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0.52 0.58 1.06 0.82 0.69 1.03 0.82 0.53 1.37 0.92 0.83 2.55 2.06 2.55 2.06 1.64 2.3 2.3 3.67 2.06 1.88 1.88 1.88 1.89 1.69 2.16 2.16 2.16 2.16 2.16 2.16 2.16 2.16	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	AR&R 20 AR&R 2	year, 25 29 year,	ninutes minutes	storm storm	5, average, a verage, a	e 115.5 mm e 115.5 mm	1/h, 2one 1 1/h, 2one 1	Image: Constraint of the sector of
Cat9 Cat4 Cat15 Cat14 Cat13 Cat12 Cat11 Cat22 Cat21 Cat23 Cat44 Cat55 Cat54 Cat55 Cat52 Cat52 Cat53 Cat54 Cat55 Cat52 Cat33 Cat34 Cat35 Cat36 Cat37 Cat38 Cat39 Cat31 Cat32 Cat33 Cat34 Cat35 Cat36 Cat37 Cat38 Cat39 Cat30 Cat31 Cat32 Cat33 Cat34 Cat35 Cat36 Cat80 Cat80 Cat80 Cat80 Cat80 Cat80 Cat80 Cat80 </td <td>0.016 0.007 0.007 0.001 0.001 0.001 0.004 0.004 0.004 0.003 0.037 0.014 0.015 0.015 0.015 0.015 0.016 0.034 0.034 0.034 0.034 0.034 0.034 0.034 0.034 0.034 0.034 0.034 0.004 0.005</td> <td>0.016 0.007 0.001 0.001 0.001 0.004 0.004 0.003 0.037 0.014 0.003 0.044 0.003 0.044 0.003 0.044 0.003 0.015 0.025 0.015 0.015 0.025 0.015 0.016 0.034 0.034 0.034 0.034 0.034 0.034 0.034 0.034 0.034 0.034 0.034 0.034 0.034 0.034 0.034 0.034 0.034 0.036 0.005 0.006 0.007 0.006 0.007 0.006 0.007 0.006 0.007 0.006 0.007 0.006 0.007 0.006 0.007 0.007 0.006 0.007 0.007 0.006 0.007 0.</td> <td>0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td> <td>0.52 0.58 1.06 0.82 0.69 1.03 0.82 0.53 1.37 0.92 0.83 2.55 2.06 2.55 2.06 1.64 2.33 3.67 2.06 1.64 2.3 3.67 2.06 1.64 2.3 2.06 1.64 2.3 2.06 1.64 2.3 2.06 1.64 2.3 2.06 2.06 2.55 2.06 1.64 2.3 2.06 2.06 2.06 2.06 2.06 2.06 2.06 2.06</td> <td>0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td> <td>0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td> <td>A AR&R 20 AR&R 20 AR&R</td> <td>year, 25 year, 25 yea</td> <td>ninutes ninutes</td> <td>storm storm</td> <td>a, average average</td> <td>₽ 115.5 mm P 115.5</td> <td>1/h, Zone 1 1/h, Zone 1</td> <td></td>	0.016 0.007 0.007 0.001 0.001 0.001 0.004 0.004 0.004 0.003 0.037 0.014 0.015 0.015 0.015 0.015 0.016 0.034 0.034 0.034 0.034 0.034 0.034 0.034 0.034 0.034 0.034 0.034 0.004 0.005	0.016 0.007 0.001 0.001 0.001 0.004 0.004 0.003 0.037 0.014 0.003 0.044 0.003 0.044 0.003 0.044 0.003 0.015 0.025 0.015 0.015 0.025 0.015 0.016 0.034 0.034 0.034 0.034 0.034 0.034 0.034 0.034 0.034 0.034 0.034 0.034 0.034 0.034 0.034 0.034 0.034 0.036 0.005 0.006 0.007 0.006 0.007 0.006 0.007 0.006 0.007 0.006 0.007 0.006 0.007 0.006 0.007 0.007 0.006 0.007 0.007 0.006 0.007 0.	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0.52 0.58 1.06 0.82 0.69 1.03 0.82 0.53 1.37 0.92 0.83 2.55 2.06 2.55 2.06 1.64 2.33 3.67 2.06 1.64 2.3 3.67 2.06 1.64 2.3 2.06 1.64 2.3 2.06 1.64 2.3 2.06 1.64 2.3 2.06 2.06 2.55 2.06 1.64 2.3 2.06 2.06 2.06 2.06 2.06 2.06 2.06 2.06	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	A AR&R 20 AR&R	year, 25 year, 25 yea	ninutes ninutes	storm storm	a, average	₽ 115.5 mm P 115.5	1/h, Zone 1 1/h, Zone 1	
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Cat9 Cat4 Cat4 Cat15 Cat14 Cat13 Cat12 Cat12 Cat21 Cat21 Cat22 Cat21 Cat22 Cat21 Cat3 Cat54 Cat55 Cat55 Cat55 Cat55 Cat55 Cat54 Cat53 Cat52 Cat31 Cat32 Cat33 Cat32 Cat33 Cat34 Cat33 Cat34 Cat35 Cat34 Cat35 Cat34 Cat35 Cat34 Cat35 Cat34 Cat34 Cat35 Cat34 Cat35 Cat34 Cat35 Cat34 Cat35 Cat34 Cat35 Cat34 Cat35 Cat36 Cat36 Cat37 Cat37 Cat37 Cat37 Cat37 Cat37 Cat37 Cat37 Cat37 Cat37 Cat36 Cat36 Cat36 Cat36 Cat36 Cat37 Cat37 Cat37 Cat37 Cat37 Cat36 Cat36 Cat36 Cat36 Cat36 Cat80 Cat37 Cat80 Cat37 Cat80 Cat37 Cat80 Cat97 Cat80	0.016 0.007 0.001 0.001 0.001 0.001 0.001 0.004 0.003 0.037 0.014 0.003 0.037 0.015 0.025 0.015 0.015 0.025 0.015 0.016 0.016 0.016 0.034 0.035 0.035 0.034 0.035 0.035 0.035 0.034 0.034 0.034 0.034 0.034 0.034 0.034 0.035 0.035 0.035 0.034 0.034 0.034 0.034 0.034 0.034 0.005 0.035 0.025 0.035 0.034 0.034 0.005 0.034 0.005 0.034 0.005 0.	0.016 0.007 0.001 0.001 0.001 0.001 0.004 0.004 0.004 0.003 0.037 0.015 0.025 0.015 0.025 0.015 0.025 0.015 0.016 0.034 0.016 0.034 0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.009 0.005 0.009 0.053 0.055 0.053 0.055 0.	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0.52 0.58 1.06 0.82 0.69 1.03 0.82 0.53 1.37 0.92 0.83 2.55 2.06 2.55 2.06 2.55 2.06 1.64 2.3 3.67 2.06 1.64 2.3 2.65 2.06 1.64 2.3 3.67 2.06 1.64 2.3 2.65 2.06 1.64 2.3 3.67 2.06 1.64 2.3 2.65 2.06 1.64 2.3 2.65 2.06 1.64 2.3 2.65 2.06 1.64 2.3 2.65 2.06 1.64 2.3 2.65 2.06 1.64 2.06 2.5 2.06 1.64 2.3 2.06 2.5 2.06 1.64 2.06 2.5 2.06 1.64 2.00 2.06 2.00 2.00 2.00 2.00 2.00 2.00	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	AR&R 20 AR&R 2	year, 25 29 29 29 29 29 29 29 29 29 29 29 29 29	ninutes ninutes	storm storm	a, average		1/h, Zone 1 1/h, Zone 1	

PIPE DETAILS													
Name	Max Q	Max V	Max U/S	Max D/S	Due to St	orm							
	(cu.m/s)	(m/s)	HGL (m)	HGL (m)									
Pipe125	0.015	0.14	26.976	26.976	AR&R 20	/ear, 15 mi	inutes storr	m, average	e 149.5 mr	n/h, Zone 1			
Pipe127	0.112	1.02	26.902	26.859	AR&R 20	/ear, 20 mi	inutes storr	m, average	e 127 mm/	h, Zone 1			
Pipe129	0.112	1.01	26.787	26.778	AR&R 20	/ear, 20 mi	inutes storr	m, average	e 127 mm/	h, Zone 1			
Pipe132	0.129	1.17	26.686	26.632	AR&R 20	/ear, 20 mi	inutes storr	m, average	e 127 mm/	h, Zone 1			
Pipe135	0.129	1.17	26.608	26.586	AR&R 20	/ear, 20 mi	inutes storr	m, average	e 127 mm/	h, Zone 1			
Pipe211	0.187	1.54	25.322	25.298	AR&R 20	year, 25 mi	inutes storr	m, average	115.5 mr	n/h, Zone 1			
Pipe223	0.187	2.11	25.125	25.092	AR&R 20	year, 25 m ⁱ	inutes storr	m, average	115.5 mr	n/h, Zone 1			
Pipe216	0.187	5.2	24.855	23.425			inutes storr						
Pipe107	0.001	0.87	30.508	30.408			inutes storr						
Pipe111	0.002	0.71	30.366	30.302			inutes storr						
Pipe113	0.007	1.3	30.262	30.199			inutes storr						
Pipe116	0.01	1.59	30.146	30.092			inutes storr						
Pipe326	0.096	4.4	29.125	26.976			inutes storr						
Pipe201	0.038	0.35	26.728	26.727			nutes storm						
Pipe202	0.051	0.47	26.715	26.714			inutes storr						
	0.15	1.36	26.588	26.586			inutes storr						
Pipe 198													
Pipe188	0.007	0.2	27.589	27.583			urs storm, a						
Pipe180	0.104	3.54	27.45	26.783			inutes storr						
Pipe195	0.102	0.93	26.718	26.714			inutes storr						
Pipe101	0.044	2.65	30.788	30.722			inutes storr						
Pipe104	0.06	1.42	30.669	30.65			inutes storr						
Pipe314	0.023	0.21	33.694	33.693			inutes storr						
Pipe78	0.149	1.35	33.508	33.35			inutes storr						
Pipe81	0.011	3.17	34.676	34.576			inutes storr						
Pipe85	0.025	1.31	34.154	34.061	AR&R 20	/ear, 25 mi	inutes storr	m, average	e 115.5 mr	n/h, Zone 1			
Pipe88	0.058	0.56	34.041	34.039	AR&R 20	/ear, 25 mi	inutes storr	m, average	e 115.5 mr	n/h, Zone 1			
Pipe310	0.089	0.81	34.036	33.983	AR&R 20	/ear, 25 mi	inutes storr	m, average	115.5 mr	n/h, Zone 1			
Pipe60	0.104	0.94	33.958	33.864	AR&R 20	/ear, 25 mi	inutes storr	m, average	115.5 mr	n/h, Zone 1			
P63	0.118	1.07	33.777	33.693	AR&R 20	year, 25 mi	inutes storr	m, average	115.5 mr	n/h, Zone 1			
Pipe161	0.004	0.11	31.605	31.6		R 20 year, 25 minutes storm, average 115.5 mm/h, Zone R 20 year, 5 minutes storm, average 222 mm/h, Zone 1							
Pipe155	0.009	6.35	31.017	30.962		R&R 20 year, 25 minutes storm, average 115.5 mm/h, Zone 1							
Pipe153	0.015	1.2	30.929	30.843	AR&R 20 year, 25 minutes storm, average 115.5 mm/h, Zone 1								
Pipe150	0.021	1.32	30.81	30.725	AR&R 20 year, 25 minutes storm, average 115.5 mm/h, Zone 1								
Pipe145	0.027	1.4	30.689	30.607									
Pipe290	0.027	1.44	30.564	30.459	AR&R 20 year, 25 minutes storm, average 115.5 mm/h, Zone 1 AR&R 20 year, 25 minutes storm, average 115.5 mm/h, Zone 1								
Pipe237	0.085	2.17	35.025	34.567		R&R 20 year, 25 minutes storm, average 115.5 mm/h, Zone 1 R&R 20 year, 25 minutes storm, average 115.5 mm/h, Zone 1							
Pipe344	0.085	4.25	34.439	32.165			inutes storr						
Pipe169	0.091	4.34	32.083	30.042	AR&R 20 year, 25 minutes storm, average 115.5 mm/h, Zone 1								
Pipe175	0.098	4.43	29.598	28.746	AR&R 20 year, 25 minutes storm, average 115.5 mm/h, Zone 1 AR&R 20 year, 25 minutes storm, average 115.5 mm/h, Zone 1								
Pipe240	0.022	0.55	26.801	26.778									
Pipe247	0.053	1.6	30.654	30.455	AR&R 20	/ear, 25 mi	inutes storr	m, average	e 115.5 mr	n/h, Zone 1			
CHANNEL DETAILS													
Name	Max Q	Max V			Due to St	orm							
	(cu.m/s)	(m/s)											
OVERFLOW ROUTE DETAILS													
Name	Max Q U/S	Max Q D/S	Safe Q	Max D	Max DxV	Max Widt	t Max V	Due to St	orm				
OF169	0	0	0.399	0	0	0	0						
OF214	0	0	0.256	0	0	0	0						
OF222	0	0	0.256	0	0	0	0						
OF224	0	0	0.256	0	0	0	0						
OF226	0	0	0.256	0	0	0	0						
OF220	0	0	0.256	0	0	0	0						
OF148	0	0	0.307	0	0	0	0						
OF142	0.01	0.01	0.376	0.048	0.05	0.4		AR&R 20	vear. 25 m	inutes storr	n. average	115.5 mm	/h. Zone
OF 167	0.006	0.006	0.445	0.038	0.04	0.31				inutes storr			
OF107 OF197	0.008	0.008	0.465	0.038	0.04	3.44				inutes storr			
OF137 OF133	0.009					0.39				inutes storr			
OF133 OF155		0.009	0.376	0.047	0.05		1.01						
	0.001	0.001		0.021		0.18	0.3			inutes storr			
OF157	0.004	0.004	0.181	0.012	0	4.04				inutes storr			
OF159	0.005	0.005	0.432	0.034	0.03	0.28				inutes storr			
OF123	0.003	0.003	0.376	0.03	0.02	0.25				inutes storr			
OF126	0.002	0.002	0.376	0.026	0.02	0.22		AR&R 20	year, 25 m	inutes storr	n, average	115.5 mm,	/h, Zone
OF186	0	0	0.181	0	0	0	0			_			
OF181	0	0	0.181	0	0	0	0						
OF178	0	0	0.181	0	0	0	0						
OF174	0	0	0.181	0	0	0	0						
OF171	0	0	0.181	0	0	0	0						
OF144	0.002	0.002	0.238	0.03	0.01	0.25		AR&R 20	year, 25 m	inutes storr	n, average	115.5 mm,	/h, Zone
DETENTION BASIN DETAILS													
	Max WL	MaxVol	Max Q	Max Q	Max Q								
	Max WL	MaxVol	Max Q Total	Max Q Low Level	Max Q High Leve	1							
DETENTION BASIN DETAILS Name OSD-Tank	Max WL 26.59	MaxVol 68.2	Max Q Total 0.187	Max Q Low Level 0.187	Max Q High Leve 0	9							

CONTINUITY CHECK for AR&R 20 year, 25 minutes storm, average 1	15.5 mm/h, Zo	ne 1							
Node	Inflow	Outflow	Storage Change	Difference					
	(cu.m)	(cu.m)	(cu.m)	%					
Pit10	12.02	11.85	0	1.4					
Pit9	91.65	91.23	0	0.5					
Pit8	91.23	91.54	0	-0.3					
Pit7	108.05	107.49	0	0.5					
Pit6	107.49	108.01	0	-0.5					
OSD-Tank	236.8	236.61	0.19	0					
Pit2 GPT	236.61	236.74	0	-0.1					
Pit1 GPT	236.74	236.77	0	0					
N747	236.77	236.77	0	0					
Pit15	0.94	0.93	0	1.6					
Pit14	1.87	1.87	0	0.2					
Pit13	5.17	5.12	0	1					
Pit12	7.94	7.96	0	-0.2					
Pit11	74.61	74.38	0	0.3					
Pit22	27.8	27.58	0	0.8					
Pit21	37.95	37.96	0	0					
Pit 16	116.07	116.07	0	0					
Pit23	2.12	2.08	0	2					
Pit18	78.32	78.07	0	0.3					
Pit 17	78.07	78.11	0	0					
Pit42	34.41	34.44	0	-0.1					
Pit41	45.75	45.68	0	0.2					
N745	45.68	45.68	0	0					
Pit51	20.68	20.69	0	-0.1					
Pit50	121.85	121.84	0	0					
N742	120.36	120.36	0	0					
Pit57	7.54	7.51	0	0.4					
Pit56	19.29	19.33	0	-0.2					
Pit55	44.77	44.67	0	0.2					
Pit54	70.12	70.11	0	0					
Pit53	82.42	82.39	0	0					
Pit52	92.76	92.63	0	0.1					
Ex31	3.3	3.3	0	0.1					
N30	3.3	3.3	0	0					
Pit32	7.07		0	0.8					
		7.01							
Pit33	11.49	11.44	0	0.4					
Pit34	16.63	16.57	0	0.3					
Pit35	21.29	21.23	0	0.3					
Pit36	24.06	24.02	0	0.1					
NRoof4&2	64.14	64.14	0	0					
Pit20A	64.14	64.06	0	0.1					
Pit20	69.24	69.2	0	0.1					
Pit19	76.27	76.24	0	0					
NRoof 1	16.64	16.51	0	0.8					
NRoof3	40.06	40.03	0	0.1					
N832	0	0	0	0					
Run Log for 130711 Lismore Hospital Drainage.drn run at 16:05:18 d	on 11/7/2013								
No water upwelling from any pit.									
Freeboard was less than 0.15m at Pit9, Pit50, Pit22, Pit10									
Flows were safe in all overflow routes.	1								
riows were sale in all overflow routes.									

DRAINS results prepared 11 July, 2013 from Version 2013.06												
PIT / NODE DETAILS				Version 8								
Name	Max HGL	Max Pond	Max Surface	Max Pond	Min		Constraint					
		HGL	Flow Arriving (cu.m/s)	Volume (cu.m)	(m)	c (cu.m/s)						
Pit10	27.2	27.2	0.02	2.6	-0.1	0.019	Outlet Syste	em				
Pit9	27.2	27.2	0.027	2.6	-0.1	0.056	Outlet Syste					
Pit8	27.19		0.056		0.09	0.031	Inlet Capacit Outlet Syste					
Pit7 Pit6	27.15 27.06		0.031 0.015		0	0.015	Inlet Capacit					
Pit2 GPT	25.38		0		1.77		None	.,				
Pit1 GPT	25.13		0		1.87		None					
N747	23.42	24.25	0	0.2	0.02		Laboration of the	•				
Pit15 Pit14	30.52 30.38	31.36 31.36	0.002	0.2	0.83 0.97		Inlet Capacit Inlet Capacit					
Pit13	30.3	31.4	0.006	0.5	1.08		Inlet Capacit					
Pit12	30.19	31.37	0.005	0.4	1.16		Inlet Capacit	ty				
Pit11	29.35	31.37	0.004	0.4	2		Inlet Capacit					
Pit22 Pit21	27 27.14	26.95 27.14	0.046	1.3 1	-0.2 -0.09	0.054	Outlet Syste Outlet Syste					
Pit 16	27.15	27.24	0	-	0.05		None					
Pit23	27.62		0.004		0.88		None					
Pit18	27.61		0.003		2.09	0	None					
Pit 17 Pit42	27.25 30.98		0 0.107		0	0.03	None Inlet Capacit	tu i				
Pit41	30.58		0.048		1.11	0.015	Inlet Capacit					
N745	30.65		0.015					.,				
Pit51	33.71		0.04		0.39	0.011	Inlet Capacit					
Pit50	33.7		0.022		0	0.046	Outlet Syste	em				
N742 Pit57	33.35 34.73		0 0.013		1.39	-	None					
Pit56	34.27		0.02		1.35	0.001	Inlet Capacit	ty				
Pit55	34.25		0.043		1.25	0.007	Inlet Capacit					
Pit54	34.22		0.049		1.28	0.008	Inlet Capacit	ty				
Pit53 Pit52	34.14 33.96		0.024 0.022		0.96	0.004	Inlet Capacit Inlet Capacit					
Ex31	33.96		0.022		0.49	0.004	None	.,				
N30	31.6		0									
Pit32	31.1	31.91	0.012	1.1	0.77	0	Inlet Capacit					
Pit33	30.96	31.9	0.007	1	0.91	0	Inlet Capacit					
Pit34 Pit35	30.85 30.73	31.9 31.9	0.009 0.008	1.2 1.1	1.02 1.14	0	Inlet Capacit Inlet Capacit					
Pit36	30.61	31.9	0.005	1.1	1.14	0	Inlet Capacit					
NRoof4&2	35.26		0.102									
Pit20A	34.6		0		0.8		None					
Pit20 Pit19	32.18 29.7		0.009		1.32 1.3	0.003	None Inlet Capacit	ty				
NRoof 1	27.21		0.012		1.5	0.003	inier capaci	Ly				
NRoof3	30.82		0.064									
SUB-CATCHMENT DETAILS Name	Max	Paved	Grassed	Paved	Grassed	Supp	Due to Storn	n				
Name	Flow Q	Max Q	Max Q	Tc	Tc	Tc	Due to ston					
	(cu.m/s)	(cu.m/s)	(cu.m/s)	(min)	(min)	(min)						
Cat10	0.02	0.02	0	0.36	0	0		ear, 5 minutes stor				
Cat9 Cat4	0.009	0.009 0.021	0	0.41	0	0		ear, 5 minutes stor ear, 5 minutes stor				
Cati	0.021	0.021	0	0.57	0	0		ear, 5 minutes stor				
Cat14	0.002	0.002	0	0.48	0	0		ear, 5 minutes stor				
Cat13	0.006	0.006	0	0.72	0	0		ear, 5 minutes stor				
Cat12	0.005	0.005	0	0.57	0	0		ear, 5 minutes stor ear, 5 minutes stor				
Cat11 Cat22	0.004	0.004	0	0.37	0	0		ear, 5 minutes stor				
Cat21	0.017	0.017	0	0.64	0	0		ear, 5 minutes stor				
Cat23	0.004	0.004	0	0.58	0	0		ear, 5 minutes stor				
Cat42	0.05	0.05	0	1.78 1.44	0	0		ear, 5 minutes stor				
Cat41 Cat51	0.019	0.019 0.031	0	1.44	0	0		ear, 5 minutes stor ear, 5 minutes stor				
Cat50	0.019	0.019	0	1.44	0	0		ear, 5 minutes stor				
Cat57	0.013	0.013	0	1.15	0	0	AR&R 100 ye	ear, 5 minutes stor	m, average	283 mm/h	, Zone 1	
Cat56	0.02	0.02	0	1.61	0	0		ear, 5 minutes stor				
Cat55 Cat54	0.042	0.042	0	1.63 2.56	0	0		ear, 5 minutes stor ear, 5 minutes stor				
Cat53	0.024	0.024	0	1.44	0	0		ear, 5 minutes stor				
Cat52	0.017	0.017	0	1.31	0	0	AR&R 100 ye	ear, 5 minutes stor	m, average	283 mm/h	, Zone 1	
Cat31	0.006	0.006	0	0.65	0	0		ear, 5 minutes stor				
Cat32 Cat33	0.012	0.012 0.007	0	1.17 0.73	0	0		ear, 5 minutes stor ear, 5 minutes stor				
Cat34	0.009	0.009	0	0.73	0	0		ear, 5 minutes stor				
Cat35	0.008	0.008	0	0.44	0	0	AR&R 100 ye	ear, 5 minutes stor	m, average	283 mm/h	, Zone 1	
Cat36	0.005	0.005	0	0.33	0	0		ear, 5 minutes stor				
CatRoof4&2	0.102	0.102	0	5 1.23	0	0		ear, 5 minutes stor ear, 5 minutes stor				
B-dL/M		0.003	0	0.68	0	0		ear, 5 minutes stor				
Cat20 Cat19	0.012		0	5	0	0	AR&R 100 ye	ear, 5 minutes stor	m, average	283 mm/h	, Zone 1	
Cat19 CatRoof1	0.027	0.027			0	0	AR&R 100 ye	ear, 5 minutes stor	m. average	283 mm/h	, Zone 1	
		0.027 0.064	0	5					,			
Cat19 CatRoof1	0.027			5								
Cat19 CatRoof1 CatRoof3	0.027 0.064	0.064		5								
Cat19 CatRoof1 CatRoof3 Outflow Volumes for Total Catchment (0.87 impervious + 0.00 per	0.027 0.064	0.064 al ha)		5 Pervious Ru								
Cat19 CatRoof1 CatRoof3 Outflow Volumes for Total Catchment (0.87 impervious + 0.00 per Storm	0.027 0.064 vious = 0.87 tot. Total Rainfall cu.m	0.064 al ha) Total Runoff cu.m (Runoff %)	0 Impervious Runoff cu.m (Runoff %)	Pervious Ru cu.m (Runof	noff							
Cat19 CatRoof1 CatRoof3 Outflow Volumes for Total Catchment (0.87 impervious + 0.00 per Storm AR&R 100 year, 5 minutes storm, average 283 mm/h, Zone 1	0.027 0.064 vious = 0.87 tot. Total Rainfall cu.m 204.21	0.064 al ha) Total Runoff cu.m (Runoff %) 195.55 (95.8%)	0 Impervious Runoff cu.m (Runoff %) 195.55 (95.8%)	Pervious Ru cu.m (Runof 0.00 (0.0%)	noff							
Cat19 CatRoof1 CatRoof3 Outflow Volumes for Total Catchment (0.87 impervious + 0.00 per Storm AR&R 100 year, 5 minutes storm, average 283 mm/h, Zone 1 AR&R 100 year, 10 minutes storm, average 220 mm/h, Zone 1	0.027 0.064 vious = 0.87 tot: Total Rainfall cu.m 204.21 317.5	0.064 al ha) Total Runoff cu.m (Runoff %) 195.55 (95.8%) 308.84 (97.3%)	0 Impervious Runoff cu.m (Runoff %) 195.55 (95.8%) 308.84 (97.3%)	Pervious Ru cu.m (Runof 0.00 (0.0%) 0.00 (0.0%)	noff							
Ca139 CatRoof1 CatRoof3 Outflow Volumes for Total Catchment (0.87 impervious + 0.00 per Storm AR&R 100 year, 5 minutes storm, average 283 mm/h, Zone 1 AR&R 100 year, 10 minutes storm, average 290 mm/h, Zone 1	0.027 0.064 vious = 0.87 tot. Total Rainfall cu.m 204.21	0.064 al ha) Total Runoff cu.m (Runoff %) 195.55 (95.8%)	0 Impervious Runoff cu.m (Runoff %) 195.55 (95.8%) 308.84 (97.3%) 404.81 (97.9%)	Pervious Ru cu.m (Runof 0.00 (0.0%)	noff							
Cat19 CatRoof1 CatRoof3 Outflow Volumes for Total Catchment (0.87 impervious + 0.00 per Storm AR&R 100 year, 5 minutes storm, average 283 mm/h, Zone 1 AR&R 100 year, 10 minutes storm, average 220 mm/h, Zone 1	0.027 0.064 vious = 0.87 tot. Total Rainfall cu.m 204.21 317.5 413.47	0.064 In ha) Total Runoff cu.m (Runoff %) 195.55 (95.8%) 308.84 (97.3%) 404.81 (97.9%)	0 Impervious Runoff cu.m (Runoff %) 195.55 (95.8%) 308.84 (97.3%)	Pervious Ru cu.m (Runof 0.00 (0.0%) 0.00 (0.0%) 0.00 (0.0%)	noff							
Cat19 CatRoof1 CatRoof3 Outflow Volumes for Total Catchment (0.87 impervious + 0.00 per Storm AR&R 100 year, 5 minutes storm, average 283 mm/h, Zone 1 AR&R 100 year, 10 minutes storm, average 191 mm/h, Zone 1 AR&R 100 year, 20 minutes storm, average 120 mm/h, Zone 1 AR&R 100 year, 20 minutes storm, average 131 mm/h, Zone 1	0.027 0.064 vious = 0.87 tot: Total Rainfall cu.m 204.21 317.5 413.47 467.59 532.17 575.82	0.064 I ha) Total Runoff cu.m (Runoff %) 195.55 (95.8%) 308.84 (97.3%) 404.81 (97.9%) 458.92 (98.1%) 523.51 (98.4%) 567.16 (98.5%)	0 Impervious Runoff cu.m (Runoff %) 195.55 (95.8%) 308.84 (97.3%) 404.81 (97.3%) 404.81 (97.9%) 458.92 (98.1%) 523.51 (98.4%) 567.16 (98.5%)	Pervious Ru cu.m (Runof 0.00 (0.0%) 0.00 (0.0%) 0.00 (0.0%) 0.00 (0.0%) 0.00 (0.0%)	noff							
Cat19 CatRoof1 CatRoof3 Outflow Volumes for Total Catchment (0.87 impervious + 0.00 per Storm AR&R 100 year, 5 minutes storm, average 283 mm/h, Zone 1 AR&R 100 year, 10 minutes storm, average 191 mm/h, Zone 1 AR&R 100 year, 20 minutes storm, average 162 mm/h, Zone 1 AR&R 100 year, 25 minutes storm, average 162 mm/h, Zone 1 AR&R 100 year, 25 minutes storm, average 133 mm/h, Zone 1 AR&R 100 year, 45 minutes storm, average 1126 mm/h, Zone 1	0.027 0.064 Vious = 0.87 tot: Total Rainfall cu.m 204.21 317.5 413.47 467.59 532.17 575.82 731.25	0.064 I ha) Total Runoff cu.m (Runoff %) 195.55 (95.8%) 308.84 (97.3%) 404.81 (97.9%) 458.92 (98.1%) 523.51 (98.4%) 523.51 (98.4%) 722.61 (98.8%)	0 Impervious Runoff cu.m (Runoff %) 195.55 (95.8%) 308.84 (97.3%) 404.81 (97.9%) 458.92 (98.1%) 523.51 (98.4%) 567.16 (98.5%) 722.61 (98.8%)	Pervious Ru cu.m (Runof 0.00 (0.0%) 0.00 (0.0%) 0.00 (0.0%) 0.00 (0.0%) 0.00 (0.0%) 0.00 (0.0%)	noff							
Cat19 CatRoof1 CatRoof3 Outflow Volumes for Total Catchment (0.87 impervious + 0.00 per Storm AR&R 100 year, 5 minutes storm, average 283 mm/h, Zone 1 AR&R 100 year, 15 minutes storm, average 120 mm/h, Zone 1 AR&R 100 year, 20 minutes storm, average 120 mm/h, Zone 1 AR&R 100 year, 25 minutes storm, average 147.5 mm/h, Zone 1 AR&R 100 year, 30 minutes storm, average 133 mm/h, Zone 1 AR&R 100 year, 30 minutes storm, average 133 mm/h, Zone 1 AR&R 100 year, 14 minutes storm, average 126 mm/h, Zone 1 AR&R 100 year, 14 minutes storm, average 127 mm/h, Zone 1	0.027 0.064 Vious = 0.87 tot: Total Rainfall cu.m 204.21 317.5 413.47 467.59 532.17 575.82 731.25 798.36	0.064 Total Runoff cum (Runoff %) 195.55 (95.8%) 308.84 (97.3%) 404.81 (97.9%) 404.83 (97.9%) 523.51 (98.4%) 567.16 (98.5%) 722.61 (98.8%) 789.69 (98.9%)	0 Impervious Runoff cu.m (Runoff %) 195.55 (95.8%) 308.84 (97.3%) 404.81 (97.9%) 404.81 (97.9%) 438.92 (98.1%) 567.16 (98.5%) 722.61 (98.8%) 789.69 (98.5%)	Pervious Ru cu.m (Runof 0.00 (0.0%) 0.00 (0.0%) 0.00 (0.0%) 0.00 (0.0%) 0.00 (0.0%) 0.00 (0.0%) 0.00 (0.0%)	noff							
Cat19 CatRoof1 CatRoof3 Outflow Volumes for Total Catchment (0.87 impervious + 0.00 per Storm AR&R 100 year, 5 minutes storm, average 283 mm/h, Zone 1 AR&R 100 year, 10 minutes storm, average 191 mm/h, Zone 1 AR&R 100 year, 20 minutes storm, average 162 mm/h, Zone 1 AR&R 100 year, 25 minutes storm, average 162 mm/h, Zone 1 AR&R 100 year, 25 minutes storm, average 133 mm/h, Zone 1 AR&R 100 year, 45 minutes storm, average 1126 mm/h, Zone 1	0.027 0.064 Vious = 0.87 tot: Total Rainfall cu.m 204.21 317.5 413.47 467.59 532.17 575.82 731.25	0.064 I ha) Total Runoff cu.m (Runoff %) 195.55 (95.8%) 308.84 (97.3%) 404.81 (97.9%) 458.92 (98.1%) 523.51 (98.4%) 523.51 (98.4%) 722.61 (98.8%)	0 Impervious Runoff cu.m (Runoff %) 195.55 (95.8%) 308.84 (97.3%) 404.81 (97.9%) 458.92 (98.1%) 523.51 (98.4%) 567.16 (98.5%) 722.61 (98.8%)	Pervious Ru cu.m (Runof 0.00 (0.0%) 0.00 (0.0%) 0.00 (0.0%) 0.00 (0.0%) 0.00 (0.0%) 0.00 (0.0%)	noff							

PIPE DETAILS													
Name	Max Q	Max V	Max U/S	Max D/S	Due to Sto	rm							
in the second seco	(cu.m/s)	(m/s)	HGL (m)	HGL (m)	Duc to Ste			-					
Pipe125	0.022	0.2	27.2	27.2	AR&R 100 year, 25 minutes storm, average 147.5 mm/h, Zon						1		
Pipe127	0.135	1.22	27.182	27.189	AR&R 100		1						
Pipe129	0.134	1.22	27.146	27.15	AR&R 100								
Pipe132	0.159	1.44	27.087	27.055	AR&R 100								
Pipe135	0.158	1.43	27.039	27.035	AR&R 100								
Pipe211	0.213	1.41	25.407	25.384	AR&R 100	year, 1.5 h	ours storr	m, average	76.3 mm/ł	h, Zone 1			
Pipe223	0.212	1.62	25.259	25.126	AR&R 100	year, 1.5 h							
ipe216	0.212	5.39	24.863	23.425	AR&R 100								
ipe107	0.001	0.98	30.508	30.41	AR&R 100 year, 15 minutes storm, average 191 mm/h, Zone 1								
ipe107	0.003	0.74	30.369	30.304	AR&R 100 year, 15 minutes storm, average 191 mm/h, Zone :								
					AR&R 100 year, 15 minutes storm, average 191 min/ AR&R 100 year, 15 minutes storm, average 191 min/								
ipe113	0.008	1.33	30.267	30.204									
vipe116	0.013	1.48	30.156	30.098				orm, averag					
'ipe326	0.116	4.65	29.134	27.2	AR&R 100	year, 15 m	inutes sto	orm, averag	e 191 mm	/h, Zone 1			
ripe201	0.048	0.43	27.143	27.144	AR&R 100	year, 5 mi	nutes stor	m, average	e 283 mm/l	h, Zone 1			
ipe202	0.061	0.56	27.144	27.147	AR&R 100	year, 15 m	inutes sto	orm, averag	e 191 mm	/h, Zone 1			
ipe198	0.181	1.64	27.04	27.035	AR&R 100	vear. 5 mi	nutes stor	m, average	283 mm/	h. Zone 1			
ipe188	0.008	0.17	27.612	27.611				m, average					
ipe180	0.128	4.37	27.449	27.249				m, average					
ipe195	0.123	1.11	27.157	27.147				orm, averag					
ipe101	0.072	3.86	30.796	30.792				m, average					
ipe104	0.096	1.77	30.701	30.65				m, average					
ipe314	0.029	0.26	33.706	33.7	AR&R 100	year, 5 mi	nutes stor	m, average	283 mm/	h, Zone 1			
ipe78	0.15	1.36	33.517	33.35				m, average					
ipe81	0.012	3.61	34.676	34.581				m, average					
ipe85	0.012	0.72	34.247	34.251									
								m, average					
ipe88	0.072	0.65	34.223	34.219				m, average					
ipe310	0.109	0.99	34.147	34.135				m, average					
ipe60	0.127	1.15	34.034	33.958	AR&R 100	year, 5 mi	nutes stor	m, average	283 mm/	h, Zone 1			
63	0.145	1.31	33.827	33.7	AR&R 100	year, 5 mi	nutes stor	m, average	283 mm/	h, Zone 1			
ipe161	0.006	0.14	31.605	31.6	AR&R 100 year, 5 minutes storm, average 283 mm/h, Zone 1 AR&R 100 year, 5 minutes storm, average 283 mm/h, Zone 1								
Pipe155	0.011	7.67	31.017	30.967	AR&R 100 year, 15 minutes storm, average 191 mm/h, Zone 1								
ipe155	0.011	1.24	30.936	30.851	AR&R 100 year, 15 minutes storm, average 191 mm/h, zone 1 AR&R 100 year, 15 minutes storm, average 191 mm/h, Zone 1								
ipe150	0.025	1.37	30.819	30.734	AR&R 100 year, 15 minutes storm, average 191 mm/h, Zone 1								
Pipe145	0.031	1.46	30.7	30.618	AR&R 100 year, 15 minutes storm, average 191 mm/h, Zone 1								
Pipe290	0.035	1.49	30.576	30.471	AR&R 100 year, 15 minutes storm, average 191 mm/h, Zone 1								
Pipe237	0.103	2.59	35.256	34.595	AR&R 100								
Pipe344	0.102	4.48	34.448	32.183	AR&R 100 year, 5 minutes storm, average 283 mm/h, Zone 1								
Pipe169	0.109	4.57	32.092	30.051	AR&R 100 year, 15 minutes storm, average 191 mm/h, Zone 1								
	0.117	4.66	29.607	28.755									
Pipe175					AR&R 100 year, 15 minutes storm, average 191 mm/h, Zone 1 AR&R 100 year, 5 minutes storm, average 283 mm/h, Zone 1								
Pipe240	0.027	0.67	27.213	27.15									
Pipe247	0.065	1.72	30.817	30.485	AR&R 100	year, 5 mi	nutes stor	m, average	e 283 mm/l	h, Zone 1			
CHANNEL DETAILS													
Name	Max Q	Max V			Due to Sto	rm							
	(cu.m/s)	(m/s)											
	(cum/s)	(11, 5)											
OVERFLOW ROUTE DETAILS	No. 011/2	11.00/6	6-6-0					D	1	-	-		
lame	Max Q U/S	Max Q D/S	Safe Q	Max D	Max DxV			Due to Sto					
0F169	0.019	0.019	1.754	0.049	0.02	1.94	0.39					76.3 mm/h	
0F214	0.056	0.056	7.665	0.028	0.01	9.43	0.42	AR&R 100) year, 1.5	hours storn	n, average	76.3 mm/h	, Zone
0F222	0.031	0.031	7.665	0.023	0.01	7.63	0.36					76.3 mm/h	
DF224	0.015	0.015	7.665	0.018		5.84	0.29					76.3 mm/h	
DF226	0.004	0.004	7.665	0.010		3.44	0.23					76.3 mm/h	
0F220	0.054	0.054	7.665	0.028		9.43	0.4	AR&K 100	year, 1.5	nours storn	n, average	76.3 mm/h	, zone
DF148	0	0	0.307	0		0	0	-					
DF142	0.03	0.03	0.91	0.07		0.97	1.27	AR&R 100) year, 5 m	inutes stor	m, average	283 mm/h	, Zone
		0.015	0.76	0.054	0.07	0.44	1.29	AR&R 100) year, 15 n	ninutes sto	rm, averag	e 191 mm/	h, Zone
	0.015	0.015		0.004			0.46						
DF167	0.015	0.015	13.924	0.012	0.01	4.04		AK&K 100	year, 5 m	inutes stor	m, average		
DF167 DF197	0.011	0.011	13.924	0.012							m, average		
DF167 DF197 DF133	0.011 0.046	0.011 0.046	13.924 0.91	0.012 0.079	0.11	1.29	1.34	AR&R 100) year, 5 m	inutes stor	m, average	283 mm/h	, Zone
)F167)F197)F133)F1355	0.011 0.046 0.001	0.011 0.046 0.001	13.924 0.91 1.341	0.012 0.079 0.026	0.11 0.01	1.29 0.22	1.34 0.33	AR&R 100 AR&R 100) year, 5 m) year, 5 m	inutes stor inutes stor	m, average m, average	283 mm/h 283 mm/h	, Zone , Zone
0F167 0F197 0F133 0F155 0F157	0.011 0.046 0.001 0.007	0.011 0.046 0.001 0.007	13.924 0.91 1.341 5.42	0.012 0.079 0.026 0.015	0.11 0.01 0	1.29 0.22 4.94	1.34 0.33 0.18	AR&R 100 AR&R 100 AR&R 100) year, 5 m) year, 5 m) year, 5 m	inutes stor inutes stor inutes stor	m, average m, average m, average	283 mm/h 283 mm/h 283 mm/h	, Zone , Zone , Zone
PF167 PF197 PF133 PF155 PF155 PF159 PF159	0.011 0.046 0.001 0.007 0.008	0.011 0.046 0.001 0.007 0.008	13.924 0.91 1.341 5.42 0.778	0.012 0.079 0.026 0.015 0.043	0.11 0.01 0 0.05	1.29 0.22 4.94 0.35	1.34 0.33 0.18 1.09	AR&R 100 AR&R 100 AR&R 100 AR&R 100 AR&R 100) year, 5 m) year, 5 m) year, 5 m) year, 5 m	inutes stor inutes stor inutes stor inutes stor	m, average m, average m, average m, average	283 mm/h 283 mm/h 283 mm/h 283 mm/h	, Zone , Zone , Zone , Zone
0F167 0F197 0F133 0F155 0F155 0F159 0F129	0.011 0.046 0.001 0.007 0.008 0.004	0.011 0.046 0.001 0.007 0.008 0.004	13.924 0.91 1.341 5.42 0.778 0.91	0.012 0.079 0.026 0.015 0.043 0.035	0.11 0.01 0.05 0.03	1.29 0.22 4.94 0.35 0.29	1.34 0.33 0.18 1.09 0.84	AR&R 100 AR&R 100 AR&R 100 AR&R 100 AR&R 100) year, 5 m) year, 5 m) year, 5 m) year, 5 m) year, 5 m	inutes stor inutes stor inutes stor inutes stor inutes stor	m, average m, average m, average m, average m, average	283 mm/h 283 mm/h 283 mm/h 283 mm/h 283 mm/h	, Zone , Zone , Zone , Zone , Zone
F167 F197 F133 F155 F155 F159 F159	0.011 0.046 0.001 0.007 0.008	0.011 0.046 0.001 0.007 0.008	13.924 0.91 1.341 5.42 0.778	0.012 0.079 0.026 0.015 0.043	0.11 0.01 0.05 0.03	1.29 0.22 4.94 0.35	1.34 0.33 0.18 1.09	AR&R 100 AR&R 100 AR&R 100 AR&R 100 AR&R 100) year, 5 m) year, 5 m) year, 5 m) year, 5 m) year, 5 m	inutes stor inutes stor inutes stor inutes stor inutes stor	m, average m, average m, average m, average m, average	283 mm/h 283 mm/h 283 mm/h 283 mm/h	, Zone , Zone , Zone , Zone , Zone
0F167 DF197 DF133 DF155 DF155 DF157 DF159 DF123 DF126	0.011 0.046 0.001 0.007 0.008 0.004	0.011 0.046 0.001 0.007 0.008 0.004	13.924 0.91 1.341 5.42 0.778 0.91	0.012 0.079 0.026 0.015 0.043 0.035	0.11 0.01 0 0.05 0.03 0.03	1.29 0.22 4.94 0.35 0.29	1.34 0.33 0.18 1.09 0.84	AR&R 100 AR&R 100 AR&R 100 AR&R 100 AR&R 100) year, 5 m) year, 5 m) year, 5 m) year, 5 m) year, 5 m	inutes stor inutes stor inutes stor inutes stor inutes stor	m, average m, average m, average m, average m, average	283 mm/h 283 mm/h 283 mm/h 283 mm/h 283 mm/h	, Zone , Zone , Zone , Zone , Zone
F167 F197 F133 F155 F157 F159 F126 F126 F126 F126	0.011 0.046 0.001 0.007 0.008 0.004 0.004 0.004	0.011 0.046 0.001 0.007 0.008 0.004 0.004 0.004	13.924 0.91 1.341 5.42 0.778 0.91 0.91 5.42	0.012 0.079 0.026 0.015 0.043 0.035 0.033 0	0.11 0.01 0.05 0.03 0.03 0	1.29 0.22 4.94 0.35 0.29 0.27 0	1.34 0.33 0.18 1.09 0.84 0.79 0	AR&R 100 AR&R 100 AR&R 100 AR&R 100 AR&R 100) year, 5 m) year, 5 m) year, 5 m) year, 5 m) year, 5 m	inutes stor inutes stor inutes stor inutes stor inutes stor	m, average m, average m, average m, average m, average	283 mm/h 283 mm/h 283 mm/h 283 mm/h 283 mm/h	, Zone , Zone , Zone , Zone , Zone
0F167 0F197 0F193 0F155 0F155 0F159 0F123 0F126 0F186 0F181	0.011 0.046 0.001 0.007 0.008 0.004 0.004 0 0 0 0 0	0.011 0.046 0.001 0.007 0.008 0.004 0.004 0 0 0	13.924 0.91 1.341 5.42 0.778 0.91 0.91 5.42 5.42 5.42	0.012 0.079 0.026 0.015 0.043 0.035 0.033 0 0 0	0.11 0.01 0 0.05 0.03 0.03 0 0	1.29 0.22 4.94 0.35 0.29 0.27 0 0	1.34 0.33 0.18 1.09 0.84 0.79 0 0	AR&R 100 AR&R 100 AR&R 100 AR&R 100 AR&R 100) year, 5 m) year, 5 m) year, 5 m) year, 5 m) year, 5 m	inutes stor inutes stor inutes stor inutes stor inutes stor	m, average m, average m, average m, average m, average	283 mm/h 283 mm/h 283 mm/h 283 mm/h 283 mm/h	, Zone , Zone , Zone , Zone , Zone
PF167 PF137 PF133 PF155 PF157 PF157 PF126 PF126 PF126 PF181 PF178	0.011 0.046 0.001 0.007 0.008 0.004 0.004 0 0 0 0	0.011 0.046 0.001 0.007 0.008 0.004 0.004 0 0 0 0	13.924 0.91 1.341 5.42 0.778 0.91 0.91 5.42 5.42 5.42 5.42	0.012 0.079 0.026 0.015 0.043 0.035 0.033 0 0 0 0	0.11 0.01 0.05 0.03 0.03 0 0 0 0	1.29 0.22 4.94 0.35 0.29 0.27 0 0 0 0	1.34 0.33 0.18 1.09 0.84 0.79 0 0 0 0	AR&R 100 AR&R 100 AR&R 100 AR&R 100 AR&R 100) year, 5 m) year, 5 m) year, 5 m) year, 5 m) year, 5 m	inutes stor inutes stor inutes stor inutes stor inutes stor	m, average m, average m, average m, average m, average	283 mm/h 283 mm/h 283 mm/h 283 mm/h 283 mm/h	, Zone , Zone , Zone , Zone , Zone
F167 F197 F133 F155 F157 F159 F126 F126 F186 F186 F186 F187 F178	0.011 0.046 0.001 0.007 0.008 0.004 0.004 0 0 0 0 0 0 0 0 0	0.011 0.046 0.001 0.007 0.008 0.004 0.004 0 0 0 0 0 0 0 0	13.924 0.91 1.341 5.42 0.778 0.91 0.91 5.42 5.42 5.42 5.42 5.42	0.012 0.079 0.026 0.015 0.043 0.035 0.033 0 0 0 0 0 0 0	0.11 0.01 0.05 0.03 0.03 0 0 0 0 0 0	1.29 0.22 4.94 0.35 0.29 0.27 0 0 0 0 0 0	1.34 0.33 0.18 1.09 0.84 0.79 0 0 0 0 0 0	AR&R 100 AR&R 100 AR&R 100 AR&R 100 AR&R 100) year, 5 m) year, 5 m) year, 5 m) year, 5 m) year, 5 m	inutes stor inutes stor inutes stor inutes stor inutes stor	m, average m, average m, average m, average m, average	283 mm/h 283 mm/h 283 mm/h 283 mm/h 283 mm/h	, Zone , Zone , Zone , Zone , Zone
0F167 0F197 0F133 0F155 0F155 0F157 0F123 0F126 0F126 0F181 0F178 0F171	0.011 0.046 0.001 0.007 0.008 0.004 0 0 0 0 0 0 0 0 0 0 0 0	0.011 0.046 0.001 0.007 0.008 0.004 0 0 0 0 0 0 0 0 0 0 0	13.924 0.91 1.341 5.42 0.778 0.91 0.91 5.42 5.42 5.42 5.42 5.42 5.42 5.42	0.012 0.079 0.026 0.015 0.043 0.035 0.033 0 0 0 0 0 0 0 0 0 0 0	0.11 0.01 0.05 0.03 0.03 0 0 0 0 0 0 0 0 0	1.29 0.22 4.94 0.35 0.29 0.27 0 0 0 0 0 0 0 0 0 0	1.34 0.33 0.18 1.09 0.84 0.79 0 0 0 0 0 0 0 0 0 0	AR&R 100 AR&R 100 AR&R 100 AR&R 100 AR&R 100 AR&R 100) year, 5 m) year, 5 m) year, 5 m) year, 5 m) year, 5 m	inutes stor inutes stor inutes stor inutes stor inutes stor	m, average m, average m, average m, average m, average	283 mm/h 283 mm/h 283 mm/h 283 mm/h 283 mm/h 283 mm/h	, Zone , Zone , Zone , Zone , Zone , Zone
0F167 0F197 0F133 0F155 0F155 0F157 0F123 0F126 0F126 0F181 0F178 0F171	0.011 0.046 0.001 0.007 0.008 0.004 0.004 0 0 0 0 0 0 0 0 0	0.011 0.046 0.001 0.007 0.008 0.004 0.004 0 0 0 0 0 0 0 0	13.924 0.91 1.341 5.42 0.778 0.91 0.91 5.42 5.42 5.42 5.42 5.42	0.012 0.079 0.026 0.015 0.043 0.035 0.033 0 0 0 0 0 0 0	0.11 0.01 0.05 0.03 0.03 0 0 0 0 0 0 0 0 0	1.29 0.22 4.94 0.35 0.29 0.27 0 0 0 0 0 0	1.34 0.33 0.18 1.09 0.84 0.79 0 0 0 0 0 0	AR&R 100 AR&R 100 AR&R 100 AR&R 100 AR&R 100 AR&R 100) year, 5 m) year, 5 m) year, 5 m) year, 5 m) year, 5 m	inutes stor inutes stor inutes stor inutes stor inutes stor	m, average m, average m, average m, average m, average	283 mm/h 283 mm/h 283 mm/h 283 mm/h 283 mm/h	, Zone , Zone , Zone , Zone , Zone , Zone
F167 F197 F133 F155 F155 F159 F123 F123 F126 F181 F178 F174 F174	0.011 0.046 0.001 0.007 0.008 0.004 0 0 0 0 0 0 0 0 0 0 0 0	0.011 0.046 0.001 0.007 0.008 0.004 0 0 0 0 0 0 0 0 0 0 0	13.924 0.91 1.341 5.42 0.778 0.91 0.91 5.42 5.42 5.42 5.42 5.42 5.42 5.42	0.012 0.079 0.026 0.015 0.043 0.035 0.033 0 0 0 0 0 0 0 0 0 0 0	0.11 0.01 0.05 0.03 0.03 0 0 0 0 0 0 0 0 0	1.29 0.22 4.94 0.35 0.29 0.27 0 0 0 0 0 0 0 0 0 0	1.34 0.33 0.18 1.09 0.84 0.79 0 0 0 0 0 0 0 0 0 0	AR&R 100 AR&R 100 AR&R 100 AR&R 100 AR&R 100 AR&R 100) year, 5 m) year, 5 m) year, 5 m) year, 5 m) year, 5 m	inutes stor inutes stor inutes stor inutes stor inutes stor	m, average m, average m, average m, average m, average	283 mm/h 283 mm/h 283 mm/h 283 mm/h 283 mm/h 283 mm/h	, Zone , Zone , Zone , Zone , Zone , Zone
0F167 0F197 0F133 0F155 0F155 0F157 0F123 0F126 0F126 0F181 0F178 0F171	0.011 0.046 0.001 0.007 0.008 0.004 0 0 0 0 0 0 0 0 0 0 0 0	0.011 0.046 0.001 0.007 0.008 0.004 0 0 0 0 0 0 0 0 0 0 0	13.924 0.91 1.341 5.42 0.778 0.91 0.91 5.42 5.42 5.42 5.42 5.42 5.42 5.42	0.012 0.079 0.026 0.015 0.043 0.035 0.033 0 0 0 0 0 0 0 0 0 0 0	0.11 0.01 0.05 0.03 0.03 0 0 0 0 0 0 0 0 0	1.29 0.22 4.94 0.35 0.29 0.27 0 0 0 0 0 0 0 0 0 0	1.34 0.33 0.18 1.09 0.84 0.79 0 0 0 0 0 0 0 0 0 0	AR&R 100 AR&R 100 AR&R 100 AR&R 100 AR&R 100 AR&R 100) year, 5 m) year, 5 m) year, 5 m) year, 5 m) year, 5 m	inutes stor inutes stor inutes stor inutes stor inutes stor	m, average m, average m, average m, average m, average	283 mm/h 283 mm/h 283 mm/h 283 mm/h 283 mm/h 283 mm/h	, Zone , Zone , Zone , Zone , Zone , Zone
0F167 0F197 0F133 0F155 0F155 0F157 0F123 0F126 0F126 0F181 0F178 0F174 0F171 0F174	0.011 0.046 0.001 0.007 0.008 0.004 0 0 0 0 0 0 0 0 0 0 0 0	0.011 0.046 0.001 0.007 0.008 0.004 0 0 0 0 0 0 0 0 0 0 0	13.924 0.91 1.341 5.42 0.778 0.91 0.91 5.42 5.42 5.42 5.42 5.42 5.42 5.42	0.012 0.079 0.026 0.015 0.043 0.035 0.033 0 0 0 0 0 0 0 0 0 0 0	0.11 0.01 0.05 0.03 0.03 0 0 0 0 0 0 0 0 0	1.29 0.22 4.94 0.35 0.29 0.27 0 0 0 0 0 0 0 0 0 0	1.34 0.33 0.18 1.09 0.84 0.79 0 0 0 0 0 0 0 0 0 0	AR&R 100 AR&R 100 AR&R 100 AR&R 100 AR&R 100 AR&R 100) year, 5 m) year, 5 m) year, 5 m) year, 5 m) year, 5 m	inutes stor inutes stor inutes stor inutes stor inutes stor	m, average m, average m, average m, average m, average	283 mm/h 283 mm/h 283 mm/h 283 mm/h 283 mm/h 283 mm/h	, Zone , Zone , Zone , Zone , Zone , Zone
DF 167 DF 167 DF 197 DF 153 DF 155 DF 155 DF 155 DF 155 DF 126 DF 126 DF 126 DF 126 DF 126 DF 127 DF 127	0.011 0.046 0.001 0.007 0.008 0.004 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0.011 0.046 0.001 0.007 0.008 0.004 0 0 0 0 0 0 0 0 0 0 0 0 0 0	13.924 0.91 1.341 5.42 0.778 0.91 0.91 5.42 5.42 5.42 5.42 5.42 5.42 5.42 5.42	0.012 0.079 0.026 0.015 0.043 0.035 0.033 0 0 0 0 0 0 0 0 0 0 0 0	0.11 0.01 0.05 0.03 0.03 0 0 0 0 0 0 0 0 0 0 0 0 0 0	1.29 0.22 4.94 0.35 0.29 0.27 0 0 0 0 0 0 0 0 0 0	1.34 0.33 0.18 1.09 0.84 0.79 0 0 0 0 0 0 0 0 0 0	AR&R 100 AR&R 100 AR&R 100 AR&R 100 AR&R 100 AR&R 100) year, 5 m) year, 5 m) year, 5 m) year, 5 m) year, 5 m	inutes stor inutes stor inutes stor inutes stor inutes stor	m, average m, average m, average m, average m, average	283 mm/h 283 mm/h 283 mm/h 283 mm/h 283 mm/h 283 mm/h	, Zone : , Zone : , Zone : , Zone : , Zone :
DF 167 DF 167 DF 197 DF 153 DF 155 DF 155 DF 155 DF 155 DF 126 DF 126 DF 126 DF 126 DF 126 DF 127 DF 127	0.011 0.046 0.001 0.007 0.008 0.004 0 0 0 0 0 0 0 0 0 0 0 0	0.011 0.046 0.001 0.007 0.008 0.004 0 0 0 0 0 0 0 0 0 0 0	13,924 0.91 1.341 5.42 0.778 0.91 0.91 0.91 5.42 5.42 5.42 5.42 5.42 5.42 5.42 1.19 Max Q	0.012 0.079 0.026 0.015 0.043 0.035 0.033 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0.11 0.01 0.05 0.03 0.03 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	1.29 0.22 4.94 0.35 0.29 0.27 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 29	1.34 0.33 0.18 1.09 0.84 0.79 0 0 0 0 0 0 0 0 0 0	AR&R 100 AR&R 100 AR&R 100 AR&R 100 AR&R 100 AR&R 100) year, 5 m) year, 5 m) year, 5 m) year, 5 m) year, 5 m	inutes stor inutes stor inutes stor inutes stor inutes stor	m, average m, average m, average m, average m, average	283 mm/h 283 mm/h 283 mm/h 283 mm/h 283 mm/h 283 mm/h	, Zone : , Zone : , Zone : , Zone : , Zone :
07167 07167 07197 07133 07155 07157 07159 07126 07126 07126 07126 07126 07180 07180 07171 07174 07171 07174 07171 07174 07171 07144 DETENTION BASIN DETAILS Name 0SD-Tank	0.011 0.046 0.001 0.007 0.008 0.004 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0.011 0.046 0.001 0.007 0.008 0.004 0 0 0 0 0 0 0 0 0 0 0 0 0 0	13.924 0.91 1.341 5.42 0.778 0.91 0.91 5.42 5.42 5.42 5.42 5.42 5.42 5.42 5.42	0.012 0.079 0.026 0.015 0.043 0.035 0.033 0 0 0 0 0 0 0 0 0 0 0 0	0.11 0.01 0.05 0.03 0.03 0 0 0 0 0 0 0 0 0 0 0 0 0 0	1.29 0.22 4.94 0.35 0.29 0.27 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 29	1.34 0.33 0.18 1.09 0.84 0.79 0 0 0 0 0 0 0 0 0 0	AR&R 100 AR&R 100 AR&R 100 AR&R 100 AR&R 100 AR&R 100) year, 5 m) year, 5 m) year, 5 m) year, 5 m) year, 5 m	inutes stor inutes stor inutes stor inutes stor inutes stor	m, average m, average m, average m, average m, average	283 mm/h 283 mm/h 283 mm/h 283 mm/h 283 mm/h 283 mm/h	, Zone , Zone , Zone , Zone , Zone , Zone

CONTINUITY CHECK for AR&R 100 year, 5 minutes storm, average 2	83 mm/h, Zone	1							
Node	Inflow	Outflow	Storage Change	Difference					
	(cu.m)	(cu.m)	(cu.m)	%					
Pit10	5.76	5.73	0	0.5					
Pit9	44.15	43.57	0	1.3					
Pit8	43.57	44.03	0	-1.1					
Pit7	51.92	51.27	0	1.2					
Pit6	51.27	52.22	0	-1.8					
OSD-Tank	113.92	113.76	0.16	0					
Pit2 GPT	113.76	114.32	0	-0.5					
Pit1 GPT	114.32	114.41	0	-0.1					
N747	114.41	114.41	0	0					
Pit15	0.45	0.44	0	2.3					
Pit14	0.89	0.9	0	-0.3					
Pit13	2.48	2.48	0	0					
Pit12	3.83	3.78	0	1.2					
Pit11	35.82	35.83	0	0					
Pit22	13.32	13.13	0	1.5					
Pit21	18.1	18.25	0	-0.8					
Pit 16	55.71	55.6	0	0.2					
Pit23	1.02	0.97	0	5.2					
Pit18	37.55	37.42	0	0.3					
Pit 17	37.42	37.46	0	-0.1					
Pit42	24.04	24.06	0	-0.1					
Pit41	29.48	29.41	0	0.2					
N745	29.41	29.41	0	0					
Pit51	10.83	10.89	0	-0.5					
Pit50	57.06	57.21	0	-0.3					
N742	50.12	50.12	0	0					
Pit57	3.61	3.55	0	1.9					
	9.19	9.32	0	-1.4					
Pit56	21.51	21.27	0						
Pit55 Pit54	33.46	33.41	0	1.1 0.2					
Pit53	38.39	38.41	0	0					
Pit52	43.38	43.25	0	0.3					
Ex31	1.58	1.58	0	0					
N30	1.58	1.58	0	0					
Pit32	3.39	3.37	0	0.6					
Pit33	5.51	5.5	0	0.2					
Pit34	7.98	7.97	0	0.1					
Pit35	10.23	10.22	0	0.1					
Pit36	11.58	11.6	0	-0.2					
NRoof4&2	30.74	30.75	0	0					
Pit20A	30.75	30.71	0	0.1					
Pit20	33.2	33.19	0	0					
Pit19	36.58	36.58	0	0					
NRoof 1	7.97	7.89	0	1.1					
NRoof3	19.2	19.19	0	0.1					
N832	0	0	0	0					
Run Log for 130711 Lismore Hospital Drainage.drn run at 16:03:00 o	on 11/7/2013								
Upwelling occurred at Pit9, Pit50, Pit22, Pit21									
Freeboard was less than 0.15m at Pit 16, Pit 17, Pit10, Pit8, Pit7									
Flows were safe in all overflow routes.									
The following overflow routes carried water uphill (adding energy									
These results may be invalid. You should check for water flowing	round in circle	at these location	 You may need to re 	eformulate the	e model.				

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