

Appendix 5 – Flood Risk and Drainage Policy Review

National Planning Policy Framework

The Government's national policy on Development and Flood Risk is covered by the National Planning Policy Framework March 2012 and its associated Technical Guidance. The principal aim of the NPPF for flood risk is:

"Inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risk, but where development is necessary, making it safe without increasing flood risk elsewhere."

The Technical Guidance to the NPPF March 2012 sets out the sequential approach to development and flood risk and the responsibilities of key stakeholders in assessing flood risk. With regard to the sequential approach it states:

"The overall aim should be to steer new development to Flood Zone 1. Where there are no reasonably available sites in Flood Zone 1, local planning authorities allocating land in local plans or determining planning applications for development at any particular location should take into account the flood risk vulnerability of land uses (see table 2) and consider reasonably available sites in Flood Zone 2, applying the Exception Test if required (see table 3). Only where there are no reasonably available sites in Flood Zones 1 or 2 should the suitability of sites in Flood Zone 3 be considered, taking into account the flood risk vulnerability of land uses and applying the Exception Test if required."

The tables relating to flood risk vulnerability classification and flood zone compatibility are included in Appendix 6 below.

Central Government Written Statement to Parliament on Sustainable Drainage Systems, 18 December 2014

In absence of implementation of Section 3 of the Flood and Water Management Act 2010 relating to National Standards, Approving Bodies and Mandatory Adoption for sustainable drainage the Secretary of State for Communities and Local Government has instructed Local Planning Authorities to ensure that sustainable drainage systems for the management of run-off are put in place, unless demonstrated to be inappropriate and that there are clear arrangements in place for ongoing maintenance over the lifetime of the development.

The new guidance took effect on 6 April 2015 and include all major development as defined by Article 2(1) of the Town and Country Planning (Development Management Procedure) (England) Order 2010).

Update from Environment Agency on Flood Risk Assessments: Climate Change Allowances, 19 February 2016

The Environment Agency issued an update on previous climate change allowances to support the National Planning Policy Framework, effective from 19th February 2016. The updated guidance includes an increase in peak rainfall intensity allowance to 40% to account for climate change for small and urban catchments.

Havant Borough Core Strategy, March 2011

The Havant Borough Core Strategy is part of the borough's Local Development Framework [HBLDF] and sets an overall policy framework for all other local development documents. The Core Strategy was adopted on 1st March 2011 and as part of the HBLDF will guide the development of the borough until 2026.

Section 1.06 states: “[The Core Strategy] contains strategic policies and some detailed development management policies against which individual planning applications will be assessed. When considering planning applications the council will consider all the policies contained in the Core Strategy that are relevant to the proposal.”

Policy CS15 Flood and Coastal Erosion Risk states:

“Development in areas at risk of flooding now and in the future as identified on the latest Environment Agency flood risk maps and Strategic Flood Risk Assessment climate change maps will only be permitted where:

- 1. It meets the sequential and exception test (where required) in relation to PPS25.*
- 2. The site is located in a low hazard area as defined in the Strategic Flood Risk Assessment.*
- 3. A site-specific flood risk assessment demonstrates that the development will be safe, including the access, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall.*
- 4. The scheme incorporates flood protection, flood resilience and resistance measures appropriate to the character and biodiversity of the area and the specific requirements of the site.*
- 5. Appropriate flood warning and evacuation plans are in place.*
- 6. New site drainage systems are designed taking account of events which exceed the normal design standard.*

All development will be required to ensure that there is no net increase in surface water run off. Priority should be given to incorporating Sustainable Drainage Systems (SuDS) to manage surface water drainage, unless it is proven that SuDS are not appropriate. Where SuDS are provided arrangements must be put in place for their whole life management and maintenance.

The council will work with partners to implement the Coastal Policy Zones in the North Solent Shoreline Management Plan to ensure that development avoids areas at risk from coastal erosion and coastal flooding and that areas required to offset coastal squeeze and prevent habitat fragmentation, to allow species to adapt to climate change, are identified and protected from development.”

Havant Borough Local Plan (Allocations), July 2014

The Allocations Plan was adopted on 23rd July 2014 and as part of the HBLDF will guide the development of the borough until 2026.

Policy DM25 states: “Planning permission will be granted for developments within the Emsworth urban area boundary that can demonstrate how post development runoff has been reduced by the greatest percentage rates and volumes that are possible in the context of cost, technical feasibility and viability.”

Havant Borough Local Plan Housing Statement, December 2016

Yet to be adopted, the Housing Statement identifies the requirement for new housing within Havant Borough. The proposed site is listed (reference ‘UW02b’), and as such is subject to the remainder of the policies listed in the Adopted Local Plan and Guiding Principles listed within the Housing Statement.

PUSH Strategic Flood Risk Assessment, December 2007

The Strategic Flood Risk Assessment was produced for the Partnership for Urban South Hampshire.

Section 4.2.1 states: *“Output Package 1 [of the SFRA] is intended to assist in the application of the Sequential test, by providing information to guide decisions on location of future development in relation to areas of flood risk and, more specifically, the Flood Zones.”*

The above package has been consulted in this Flood Risk Assessment.

Hampshire Local Flood Risk Management Strategy, July 2013

The Local Flood Risk Management Strategy (LFRMS) was produced to aid in the understanding and management of flood risk across the county.

The LFRMS identifies Emsworth and Selangor Avenue as subjects of previous instances of flooding.

Hampshire Groundwater Management Plan, October 2013

The Groundwater Management Plan establishes the risk of groundwater flooding throughout Hampshire.

Havant has previously been identified (in the LFRMS) as being at risk of groundwater flooding, however previous causes of flooding in the borough have not been attributable to groundwater therefore it is not addressed within this Plan.

Emsworth Flood Risk Strategy Review, October 2015

The area surrounding the site is identified as being affected by flooding.

Section 1.2 states: *“Emsworth is one of the Borough’s few urban areas to suffer from flooding. The settlement is located on the coast and includes the Nore Farm Stream, the West Brook and the River Ems. Over recent years, extreme weather and high tides have resulted in a high frequency of flood events, which have affected local residents and businesses and caused considerable damage to properties. These flood events were caused by a combination of fluvial and tidal influences and principally affected Selangor Avenue, Victoria Road, North Street and Bridge Road in Emsworth.”*

Policy DM25 from the Local Plan (allocations) is applicable to all new developments within Emsworth.

The proposed alleviation schemes for Emsworth are mentioned and the Nore Farm Stream Flood Alleviation Scheme is highlighted – this has been taken into account in this Flood Risk Assessment.

North Solent Coastline Management Plan, December 2010

The North Solent Coastline Management Plan was completed on 16th December 2010 and assesses risks associated with coastal flooding and shoreline evolution at a large scale.

The site has no specific mention in the policy statement maps.

Appendix 6 – NPPF Technical Guidance Tables 2 & 3

Table 2: Flood Risk Vulnerability Classification

Essential Infrastructure • Essential transport infrastructure (including mass evacuation routes) which has to cross the area at risk. • Essential utility infrastructure which has to be located in a flood risk area for operational reasons, including electricity generating power stations and grid and primary substations; and water treatment works that need to remain operational in times of flood. • Wind turbines.
Highly Vulnerable • Police and ambulance stations; fire stations and command centres; telecommunications installations required to be operational during flooding. • Emergency dispersal points. • Basement dwellings. • Caravans, mobile homes and park homes intended for permanent residential use. • Installations requiring hazardous substances consent. (Where there is a demonstrable need to locate such installations for bulk storage of materials with port or other similar facilities, or such installations with energy infrastructure or carbon capture and storage installations, that require coastal or water-side locations, or need to be located in other high flood risk areas, in these instances the facilities should be classified as 'Essential Infrastructure').
More Vulnerable • Hospitals • Residential institutions such as residential care homes, children's homes, social services homes, prisons and hostels. • Buildings used for dwelling houses, student halls of residence, drinking establishments, nightclubs and hotels. • Non-residential uses for health services, nurseries and educational establishments. • Landfill* and sites used for waste management facilities for hazardous waste. • Sites used for holiday or short-let caravans and camping, subject to a specific warning and evacuation plan.

Less Vulnerable

- Police, ambulance and fire stations which are not required to be operational during flooding.
- Buildings used for shops; financial, professional and other services; restaurants, cafes and hot food takeaways; offices; general industry, storage and distribution; non-residential institutions not included in the 'More Vulnerable' class; and assembly and leisure.
- Land and buildings used for agriculture and forestry.
- Waste treatment (except landfill* and hazardous waste facilities).
- Minerals working and processing (except for sand and gravel working).
- Water treatment works which do not need to remain operational during times of flood.
- Sewage treatment works, if adequate measures to control pollution and manage sewage during flooding events are in place.

Water-Compatible Development

- Flood control infrastructure.
- Water transmission infrastructure and pumping stations.
- Sewage transmission infrastructure and pumping stations.
- Sand and gravel working.
- Docks, marinas and wharves.
- Navigation facilities.
- Ministry of Defence defence installations.
- Ship building, repairing and dismantling, dockside fish processing and refrigeration and compatible activities requiring a waterside location.
- Water-based recreation (excluding sleeping accommodation).
- Lifeguard and coastguard stations.
- Amenity open space, nature conservation and biodiversity, outdoor sports and recreation and essential facilities such as changing rooms.
- Essential ancillary sleeping or residential accommodation for staff required by uses in this category, subject to a specific warning and evacuation plan.

Table 3: Flood Risk Vulnerability and Flood Risk Zone ‘Compatibility’

Flood Zones	Flood Risk Vulnerability Classification				
	Essential infrastructure	Highly vulnerable	More vulnerable	Less vulnerable	Water compatible
Zone 1	✓	✓	✓	✓	✓
Zone 2	✓	Exception Test required	✓	✓	✓
Zone 3a †	Exception Test required †	X	Exception Test required	✓	✓
Zone 3b *	Exception Test required *	X	X	X	✓*

Key:

✓ Development is appropriate

X Development should not be permitted.

Notes to table 3:

- This table does not show the application of the Sequential Test which should be applied first to guide development to Flood Zone 1, then Zone 2, and then Zone 3; nor does it reflect the need to avoid flood risk from sources other than rivers and the sea;
- The Sequential and Exception Tests do not need to be applied to minor developments and changes of use, except for a change of use to a caravan, camping or chalet site, or to a mobile home or park home site;
- Some developments may contain different elements of vulnerability and the highest vulnerability category should be used, unless the development is considered in its component parts.

† In Flood Zone 3a essential infrastructure should be designed and constructed to remain operational and safe in times of flood.

* In Flood Zone 3b (functional floodplain) essential infrastructure that has to be there and has passed the Exception Test, and water-compatible uses, should be designed and constructed to:

- remain operational and safe for users in times of flood;
- result in no net loss of floodplain storage;
- not impede water flows and not increase flood risk elsewhere.

Appendix 7 – Greenfield Runoff and SuDS Storage Calculations

- Greenfield Runoff to IH 124
- SuDS Component Sizing
 - Car Park Permeable Paving Areas
 - Road Permeable Paving
 - Typical Driveway Permeable Paving
 - Private Trench Soakaways
 - Road Swales and Trench Soakaways

Cundall, Johnston & Partners		Page 1
19 - 21 Silvermills Court Henderson Place Lane Edinburgh EH3 5DG	Havant Road Emsworth	
Date 05/05/16 File Greenfield runoff.srcx	Designed by LK Checked by AMF	
Micro Drainage Source Control 2015.1		

IH 124 Mean Annual Flood

Input

Return Period (years)	1	Soil	0.400
Area (ha)	50.000	Urban	0.000
SAAR (mm)	700	Region Number	Region 7

Results l/s

QBAR Rural 170.1
QBAR Urban 170.1

Q1 year 144.6

Q1 year	144.6
Q2 years	149.9
Q5 years	217.7
Q10 years	275.6
Q20 years	340.8
Q25 years	365.4
Q30 years	385.5
Q50 years	445.7
Q100 years	542.7
Q200 years	637.9
Q250 years	668.6
Q1000 years	877.8

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CUNDALL	JOB NUMBER / FILE:		CALCULATION NUMBER:		DRAWING REFERENCE:	
	1012052		-		CL(00)2001 & 2002	
JOB TITLE: Warblington Meadows, Emsworth	REV	CALCULATION BY:	DATE	CHECKED BY	VERIFIED BY:	
	0	AC	01/03/17	AMF	AMF	
CALCULATION: Soakaway Design Summary	1					
	2					

CALCULATIONS:							OUTPUT
REF							
Soakaway Reference	Type	TRIAL PIT REF	INFILTRATION RATE (m/s)	DRAINED AREA (m ²)	SIZE - PLAN AREA (m ²)	STORAGE DEPTH (mm)	TOTAL DEPTH (mm)
Car Park 1	Permeable Paving	TP S2	2.50E-06	401	256	375	475
Car Park 2	Permeable Paving	TP S2	2.50E-06	476	256	400	500
Car Park 3	Permeable Paving	TP S7	6.20E-06	721	321	400	500
Car Park 4	Permeable Paving	TP S7a	3.40E-06	680	374	400	500
Car Park 5	Permeable Paving	TP S8	6.00E-06	500	398	350	450
Car Park 6	Permeable Paving	TP S8	6.00E-06	509	398	350	450
Car Park 7	Permeable Paving	TP S8	6.00E-06	623	336	400	500
Car Park 8	Permeable Paving	TP S9	5.20E-06	671	349	450	550
Car Park 9	Permeable Paving	TP S10	9.20E-06	797	450	350	450
Car Park 10	Permeable Paving	TP S10	9.20E-06	342	245	300	400
Car Park 11	Permeable Paving	TP S4	5.00E-06	295	138	300	400
Car Park 12	Permeable Paving	TP 1	2.50E-06	265	167	300	400
					0		
Permeable Road 1	Permeable Paving	TP S5	1.40E-06	268	157	410	510
Permeable Road 2	Permeable Paving	TP S6	6.60E-06	1765	1115	350	450
Permeable Road 3	Permeable Paving	TP S2	2.50E-06	978	583	300	400
Permeable Road 4	Permeable Paving	TP S8	6.00E-06	940	549	350	450
Permeable Road 5	Permeable Paving	TP S9	5.20E-06	1202	974	300	400
Permeable Road 6	Permeable Paving	TP S10	9.20E-06	196	81	375	475
					0		
Trench SA 1	Private Trench Soakaway	TP 1	2.50E-06	284	25 x 1.5	1800	2000
Trench SA 2	Private Trench Soakaway	TP 2	4.00E-05	306	9 x 2.4	1800	2000
Trench SA 3	Private Trench Soakaway	TP 1	2.50E-06	217	15.2 x 2	1800	2000
Trench SA 4	Private Trench Soakaway	TP 1	2.50E-06	233	18.5 x 1.7	1800	2000
Trench SA 5	Private Trench Soakaway	TP 3	8.40E-05	126	5.2 x 1.2	1800	2000
Trench SA 6	Private Trench Soakaway	TP 3	8.40E-05	362	10.1 x 2	1800	2000
Trench SA 7	Private Trench Soakaway	TP S1	3.20E-05	357	17 x 1.5	1800	2000
Trench SA 8	Private Trench Soakaway	TP 4	5.50E-05	308	16 x 1.2	1800	2000
Trench SA 9	Private Trench Soakaway	TP S9	5.20E-06	162	9.2 x 2	1800	2000
Trench SA 10	Private Trench Soakaway	TP 5	6.50E-05	186	7 x 1.5	1800	2000
Trench SA 11	Private Trench Soakaway	TP S10a	1.70E-04	98	3.5 x 1	1800	2000
Trench SA 12	Private Trench Soakaway	TP S10a	1.70E-04	186	7 x 1	1800	2000
Swale 1	Dry Swale	TP 2	4.00E-05	614	32.6 x 4	500	1000
Swale 2	Dry Swale	TP 1	2.50E-06	357	42.6 x 5	500	1000
Swale 3	Dry Swale	TP 2	4.00E-05	245	17 x 4	500	1000
Swale 4	Dry Swale	TP 3	8.40E-05	254	13 x 4	500	1000
Swale 5	Dry Swale	TP 3	8.40E-05	854	64 x 4	500	1000
Swale 6	Dry Swale	TP S1	3.20E-05	753	35.2 x 5	500	1000
Swale 7	Dry Swale	TP 4	5.50E-05	591	41 x 5	500	1000
Road SA 1	Public Trench Soakaway	TP 4	5.50E-05	492	22 x 1.2	1900	210m
Road SA 2	Public Trench Soakaway	TP 5	6.50E-05	190	14 x 1.0	1900	210m
Road SA 3	Public Trench Soakaway	TP 5	6.50E-05	465	23 x 1.2	1900	2100

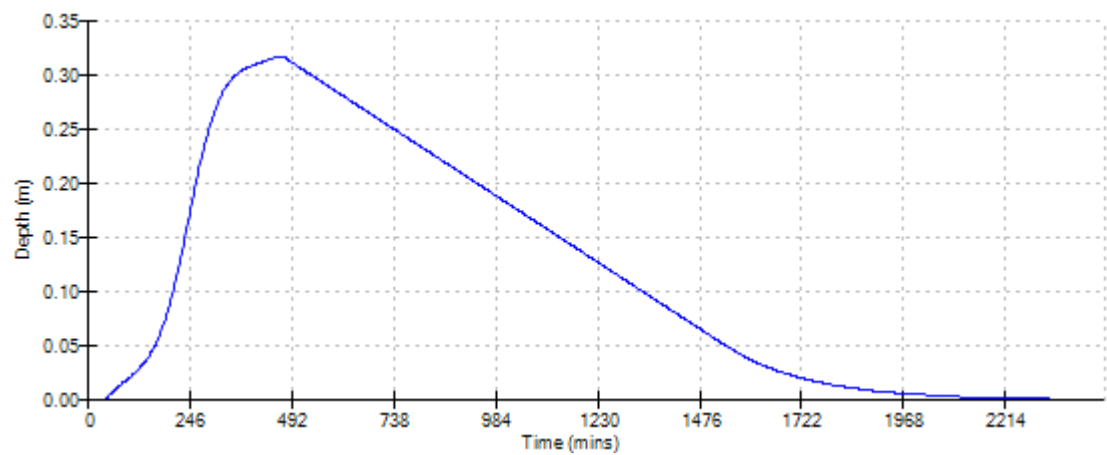
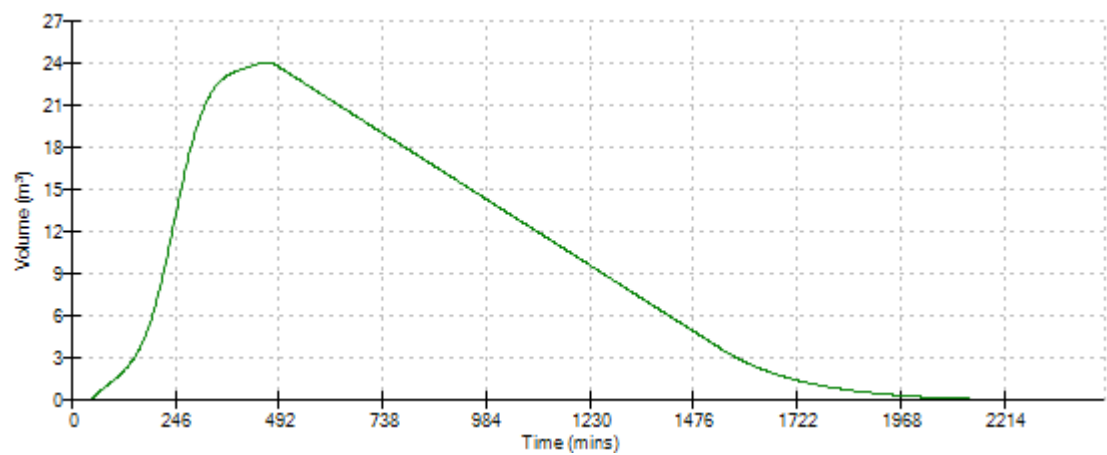
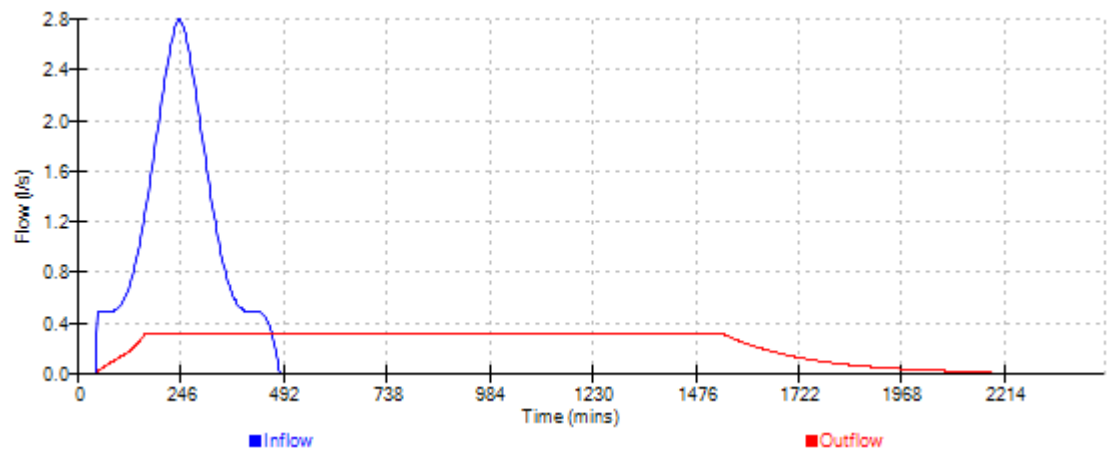
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<u>Summary of Results for 100 year Return Period (+40%)</u> Half Drain Time : 632 minutes. <table><thead><tr><th>Storm Event</th><th>Max Level (m)</th><th>Max Depth (m)</th><th>Max Infiltration (l/s)</th><th>Max Volume (m³)</th><th>Status</th></tr></thead><tbody><tr><td>15 min Summer</td><td>0.112</td><td>0.112</td><td>0.3</td><td>8.4</td><td>O K</td></tr><tr><td>30 min Summer</td><td>0.152</td><td>0.152</td><td>0.3</td><td>11.5</td><td>O K</td></tr><tr><td>60 min Summer</td><td>0.193</td><td>0.193</td><td>0.3</td><td>14.6</td><td>Flood Risk</td></tr><tr><td>120 min Summer</td><td>0.233</td><td>0.233</td><td>0.3</td><td>17.6</td><td>Flood Risk</td></tr><tr><td>180 min Summer</td><td>0.252</td><td>0.252</td><td>0.3</td><td>19.1</td><td>Flood Risk</td></tr><tr><td>240 min Summer</td><td>0.262</td><td>0.262</td><td>0.3</td><td>19.9</td><td>Flood Risk</td></tr><tr><td>360 min Summer</td><td>0.271</td><td>0.271</td><td>0.3</td><td>20.6</td><td>Flood Risk</td></tr><tr><td>480 min 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K</td></tr><tr><td>8640 min Summer</td><td>0.065</td><td>0.065</td><td>0.3</td><td>4.9</td><td>O K</td></tr><tr><td>10080 min Summer</td><td>0.053</td><td>0.053</td><td>0.3</td><td>3.9</td><td>O K</td></tr><tr><td>15 min Winter</td><td>0.127</td><td>0.127</td><td>0.3</td><td>9.5</td><td>O K</td></tr></tbody></table> <table><thead><tr><th>Storm Event</th><th>Rain (mm/hr)</th><th>Flooded Volume (m³)</th><th>Time-Peak (mins)</th></tr></thead><tbody><tr><td>15 min Summer</td><td>125.353</td><td>0.0</td><td>19</td></tr><tr><td>30 min Summer</td><td>84.267</td><td>0.0</td><td>33</td></tr><tr><td>60 min Summer</td><td>54.074</td><td>0.0</td><td>64</td></tr><tr><td>120 min Summer</td><td>33.506</td><td>0.0</td><td>122</td></tr><tr><td>180 min Summer</td><td>24.949</td><td>0.0</td><td>182</td></tr><tr><td>240 min Summer</td><td>20.093</td><td>0.0</td><td>242</td></tr><tr><td>360 min Summer</td><td>14.773</td><td>0.0</td><td>360</td></tr><tr><td>480 min Summer</td><td>11.871</td><td>0.0</td><td>478</td></tr><tr><td>600 min Summer</td><td>10.010</td><td>0.0</td><td>524</td></tr><tr><td>720 min Summer</td><td>8.703</td><td>0.0</td><td>586</td></tr><tr><td>960 min Summer</td><td>6.973</td><td>0.0</td><td>712</td></tr><tr><td>1440 min Summer</td><td>5.093</td><td>0.0</td><td>980</td></tr><tr><td>2160 min Summer</td><td>3.711</td><td>0.0</td><td>1384</td></tr><tr><td>2880 min Summer</td><td>2.961</td><td>0.0</td><td>1788</td></tr><tr><td>4320 min Summer</td><td>2.150</td><td>0.0</td><td>2552</td></tr><tr><td>5760 min Summer</td><td>1.711</td><td>0.0</td><td>3280</td></tr><tr><td>7200 min Summer</td><td>1.432</td><td>0.0</td><td>3960</td></tr><tr><td>8640 min Summer</td><td>1.240</td><td>0.0</td><td>4584</td></tr><tr><td>10080 min Summer</td><td>1.098</td><td>0.0</td><td>5240</td></tr><tr><td>15 min Winter</td><td>125.353</td><td>0.0</td><td>19</td></tr></tbody></table>						Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max 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60 min Summer	0.193	0.193	0.3	14.6	Flood Risk																																																																																																																																																																																																																		
120 min Summer	0.233	0.233	0.3	17.6	Flood Risk																																																																																																																																																																																																																		
180 min Summer	0.252	0.252	0.3	19.1	Flood Risk																																																																																																																																																																																																																		
240 min Summer	0.262	0.262	0.3	19.9	Flood Risk																																																																																																																																																																																																																		
360 min Summer	0.271	0.271	0.3	20.6	Flood Risk																																																																																																																																																																																																																		
480 min Summer	0.273	0.273	0.3	20.7	Flood Risk																																																																																																																																																																																																																		
600 min Summer	0.272	0.272	0.3	20.6	Flood Risk																																																																																																																																																																																																																		
720 min Summer	0.269	0.269	0.3	20.5	Flood Risk																																																																																																																																																																																																																		
960 min Summer	0.263	0.263	0.3	20.0	Flood Risk																																																																																																																																																																																																																		
1440 min Summer	0.248	0.248	0.3	18.8	Flood Risk																																																																																																																																																																																																																		
2160 min Summer	0.222	0.222	0.3	16.9	Flood Risk																																																																																																																																																																																																																		
2880 min Summer	0.197	0.197	0.3	14.9	Flood Risk																																																																																																																																																																																																																		
4320 min Summer	0.152	0.152	0.3	11.5	O K																																																																																																																																																																																																																		
5760 min Summer	0.114	0.114	0.3	8.6	O K																																																																																																																																																																																																																		
7200 min Summer	0.085	0.085	0.3	6.4	O K																																																																																																																																																																																																																		
8640 min Summer	0.065	0.065	0.3	4.9	O K																																																																																																																																																																																																																		
10080 min Summer	0.053	0.053	0.3	3.9	O K																																																																																																																																																																																																																		
15 min Winter	0.127	0.127	0.3	9.5	O K																																																																																																																																																																																																																		
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)																																																																																																																																																																																																																				
15 min Summer	125.353	0.0	19																																																																																																																																																																																																																				
30 min Summer	84.267	0.0	33																																																																																																																																																																																																																				
60 min Summer	54.074	0.0	64																																																																																																																																																																																																																				
120 min Summer	33.506	0.0	122																																																																																																																																																																																																																				
180 min Summer	24.949	0.0	182																																																																																																																																																																																																																				
240 min Summer	20.093	0.0	242																																																																																																																																																																																																																				
360 min Summer	14.773	0.0	360																																																																																																																																																																																																																				
480 min Summer	11.871	0.0	478																																																																																																																																																																																																																				
600 min Summer	10.010	0.0	524																																																																																																																																																																																																																				
720 min Summer	8.703	0.0	586																																																																																																																																																																																																																				
960 min Summer	6.973	0.0	712																																																																																																																																																																																																																				
1440 min Summer	5.093	0.0	980																																																																																																																																																																																																																				
2160 min Summer	3.711	0.0	1384																																																																																																																																																																																																																				
2880 min Summer	2.961	0.0	1788																																																																																																																																																																																																																				
4320 min Summer	2.150	0.0	2552																																																																																																																																																																																																																				
5760 min Summer	1.711	0.0	3280																																																																																																																																																																																																																				
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Cundall, Johnston & Partners				Page 2	
19 - 21 Silvermills Court Henderson Place Lane Edinburgh EH3 5DG		Havant Road, Emsworth SUDs Drainage Car Park 1			
Date 01/03/2017 14:39 File CAR PARK 1.SRCX		Designed by LK/AC Checked by AMF			
Micro Drainage		Source Control 2015.1			
<u>Summary of Results for 100 year Return Period (+40%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	0.171	0.171	0.3	13.0	O K
60 min Winter	0.218	0.218	0.3	16.6	Flood Risk
120 min Winter	0.264	0.264	0.3	20.0	Flood Risk
180 min Winter	0.286	0.286	0.3	21.8	Flood Risk
240 min Winter	0.299	0.299	0.3	22.7	Flood Risk
360 min Winter	0.312	0.312	0.3	23.7	Flood Risk
480 min Winter	0.317	0.317	0.3	24.1	Flood Risk
600 min Winter	0.316	0.316	0.3	24.0	Flood Risk
720 min Winter	0.313	0.313	0.3	23.8	Flood Risk
960 min Winter	0.304	0.304	0.3	23.1	Flood Risk
1440 min Winter	0.282	0.282	0.3	21.4	Flood Risk
2160 min Winter	0.243	0.243	0.3	18.5	Flood Risk
2880 min Winter	0.204	0.204	0.3	15.5	Flood Risk
4320 min Winter	0.135	0.135	0.3	10.2	O K
5760 min Winter	0.083	0.083	0.3	6.2	O K
7200 min Winter	0.052	0.052	0.3	3.8	O K
8640 min Winter	0.045	0.045	0.3	3.3	O K
10080 min Winter	0.040	0.040	0.3	2.9	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)		
30 min Winter	84.267	0.0	33		
60 min Winter	54.074	0.0	62		
120 min Winter	33.506	0.0	120		
180 min Winter	24.949	0.0	180		
240 min Winter	20.093	0.0	238		
360 min Winter	14.773	0.0	352		
480 min Winter	11.871	0.0	464		
600 min Winter	10.010	0.0	572		
720 min Winter	8.703	0.0	674		
960 min Winter	6.973	0.0	762		
1440 min Winter	5.093	0.0	1068		
2160 min Winter	3.711	0.0	1512		
2880 min Winter	2.961	0.0	1932		
4320 min Winter	2.150	0.0	2684		
5760 min Winter	1.711	0.0	3344		
7200 min Winter	1.432	0.0	3824		
8640 min Winter	1.240	0.0	4488		
10080 min Winter	1.098	0.0	5176		
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19 - 21 Silvermills Court Henderson Place Lane Edinburgh EH3 5DG	Havant Road, Emsworth SUDs Drainage Car Park 1																																					
Date 01/03/2017 14:39 File CAR PARK 1.SRCX	Designed by LK/AC Checked by AMF																																					
Micro Drainage Source Control 2015.1																																						
<u>Rainfall Details</u> <table> <tr> <td>Rainfall Model</td> <td>FSR</td> <td>Winter Storms</td> <td>Yes</td> </tr> <tr> <td>Return Period (years)</td> <td>100</td> <td>Cv (Summer)</td> <td>0.750</td> </tr> <tr> <td>Region</td> <td>England and Wales</td> <td>Cv (Winter)</td> <td>0.840</td> </tr> <tr> <td>M5-60 (mm)</td> <td>19.100</td> <td>Shortest Storm (mins)</td> <td>15</td> </tr> <tr> <td>Ratio R</td> <td>0.350</td> <td>Longest Storm (mins)</td> <td>10080</td> </tr> <tr> <td>Summer Storms</td> <td>Yes</td> <td>Climate Change %</td> <td>+40</td> </tr> </table> <u>Time Area Diagram</u> Total Area (ha) 0.040 <table> <thead> <tr> <th>Time (mins)</th> <th>Area</th> <th>Time (mins)</th> <th>Area</th> </tr> <tr> <th>From: To:</th> <th>(ha)</th> <th>From: To:</th> <th>(ha)</th> </tr> </thead> <tbody> <tr> <td>0 2</td> <td>0.020</td> <td>2 4</td> <td>0.020</td> </tr> </tbody> </table>			Rainfall Model	FSR	Winter Storms	Yes	Return Period (years)	100	Cv (Summer)	0.750	Region	England and Wales	Cv (Winter)	0.840	M5-60 (mm)	19.100	Shortest Storm (mins)	15	Ratio R	0.350	Longest Storm (mins)	10080	Summer Storms	Yes	Climate Change %	+40	Time (mins)	Area	Time (mins)	Area	From: To:	(ha)	From: To:	(ha)	0 2	0.020	2 4	0.020
Rainfall Model	FSR	Winter Storms	Yes																																			
Return Period (years)	100	Cv (Summer)	0.750																																			
Region	England and Wales	Cv (Winter)	0.840																																			
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Ratio R	0.350	Longest Storm (mins)	10080																																			
Summer Storms	Yes	Climate Change %	+40																																			
Time (mins)	Area	Time (mins)	Area																																			
From: To:	(ha)	From: To:	(ha)																																			
0 2	0.020	2 4	0.020																																			
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Cundall, Johnston & Partners		Page 4																								
19 - 21 Silvermills Court Henderson Place Lane Edinburgh EH3 5DG	Havant Road, Emsworth SUDs Drainage Car Park 1																									
Date 01/03/2017 14:39 File CAR PARK 1.SRCX	Designed by LK/AC Checked by AMF																									
Micro Drainage Source Control 2015.1																										
<u>Model Details</u> Storage is Online Cover Level (m) 0.475 <u>Porous Car Park Structure</u> <table> <tr> <td>Infiltration Coefficient Base (m/hr)</td> <td>0.00900</td> <td>Width (m)</td> <td>7.1</td> </tr> <tr> <td>Membrane Percolation (mm/hr)</td> <td>500</td> <td>Length (m)</td> <td>35.9</td> </tr> <tr> <td>Max Percolation (l/s)</td> <td>35.4</td> <td>Slope (1:X)</td> <td>10000.0</td> </tr> <tr> <td>Safety Factor</td> <td>2.0</td> <td>Depression Storage (mm)</td> <td>3</td> </tr> <tr> <td>Porosity</td> <td>0.30</td> <td>Evaporation (mm/day)</td> <td>1</td> </tr> <tr> <td>Invert Level (m)</td> <td>0.000</td> <td>Cap Volume Depth (m)</td> <td>0.375</td> </tr> </table>			Infiltration Coefficient Base (m/hr)	0.00900	Width (m)	7.1	Membrane Percolation (mm/hr)	500	Length (m)	35.9	Max Percolation (l/s)	35.4	Slope (1:X)	10000.0	Safety Factor	2.0	Depression Storage (mm)	3	Porosity	0.30	Evaporation (mm/day)	1	Invert Level (m)	0.000	Cap Volume Depth (m)	0.375
Infiltration Coefficient Base (m/hr)	0.00900	Width (m)	7.1																							
Membrane Percolation (mm/hr)	500	Length (m)	35.9																							
Max Percolation (l/s)	35.4	Slope (1:X)	10000.0																							
Safety Factor	2.0	Depression Storage (mm)	3																							
Porosity	0.30	Evaporation (mm/day)	1																							
Invert Level (m)	0.000	Cap Volume Depth (m)	0.375																							
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Event: 480 min Winter



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19 - 21 Silvermills Court		Havant Road, Emsworth			
Henderson Place Lane		SUDs Drainage			
Edinburgh EH3 5DG		Car Park 2			
Date 01/03/2017 10:00		Designed by LK/AC			
File CAR PARK 2.SRCX		Checked by AMF			
Micro Drainage		Source Control 2015.1			
<u>Summary of Results for 100 year Return Period (+40%)</u> Half Drain Time : 805 minutes.					
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	0.136	0.136	0.3	10.3	O K
30 min Summer	0.183	0.183	0.3	14.0	O K
60 min Summer	0.234	0.234	0.3	17.8	Flood Risk
120 min Summer	0.282	0.282	0.3	21.6	Flood Risk
180 min Summer	0.307	0.307	0.3	23.5	Flood Risk
240 min Summer	0.321	0.321	0.3	24.6	Flood Risk
360 min Summer	0.336	0.336	0.3	25.7	Flood Risk
480 min Summer	0.341	0.341	0.3	26.1	Flood Risk
600 min Summer	0.341	0.341	0.3	26.1	Flood Risk
720 min Summer	0.339	0.339	0.3	25.9	Flood Risk
960 min Summer	0.333	0.333	0.3	25.5	Flood Risk
1440 min Summer	0.317	0.317	0.3	24.3	Flood Risk
2160 min Summer	0.291	0.291	0.3	22.2	Flood Risk
2880 min Summer	0.264	0.264	0.3	20.2	Flood Risk
4320 min Summer	0.214	0.214	0.3	16.3	Flood Risk
5760 min Summer	0.170	0.170	0.3	12.9	O K
7200 min Summer	0.133	0.133	0.3	10.1	O K
8640 min Summer	0.103	0.103	0.3	7.8	O K
10080 min Summer	0.080	0.080	0.3	6.0	O K
15 min Winter	0.153	0.153	0.3	11.6	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)		
15 min Summer	125.353	0.0	19		
30 min Summer	84.267	0.0	34		
60 min Summer	54.074	0.0	64		
120 min Summer	33.506	0.0	122		
180 min Summer	24.949	0.0	182		
240 min Summer	20.093	0.0	242		
360 min Summer	14.773	0.0	362		
480 min Summer	11.871	0.0	480		
600 min Summer	10.010	0.0	596		
720 min Summer	8.703	0.0	644		
960 min Summer	6.973	0.0	762		
1440 min Summer	5.093	0.0	1022		
2160 min Summer	3.711	0.0	1428		
2880 min Summer	2.961	0.0	1840		
4320 min Summer	2.150	0.0	2636		
5760 min Summer	1.711	0.0	3352		
7200 min Summer	1.432	0.0	4104		
8640 min Summer	1.240	0.0	4760		
10080 min Summer	1.098	0.0	5440		
15 min Winter	125.353	0.0	19		
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19 - 21 Silvermills Court		Havant Road, Emsworth			
Henderson Place Lane		SUDs Drainage			
Edinburgh EH3 5DG		Car Park 2			
Date 01/03/2017 10:00		Designed by LK/AC			
File CAR PARK 2.SRCX		Checked by AMF			
Micro Drainage		Source Control 2015.1			
<u>Summary of Results for 100 year Return Period (+40%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	0.207	0.207	0.3	15.8	Flood Risk
60 min Winter	0.264	0.264	0.3	20.1	Flood Risk
120 min Winter	0.320	0.320	0.3	24.4	Flood Risk
180 min Winter	0.349	0.349	0.3	26.7	Flood Risk
240 min Winter	0.366	0.366	0.3	28.0	Flood Risk
360 min Winter	0.385	0.385	0.3	29.5	Flood Risk
480 min Winter	0.394	0.394	0.3	30.1	Flood Risk
600 min Winter	0.397	0.397	0.3	30.4	Flood Risk
720 min Winter	0.396	0.396	0.3	30.3	Flood Risk
960 min Winter	0.387	0.387	0.3	29.7	Flood Risk
1440 min Winter	0.366	0.366	0.3	28.0	Flood Risk
2160 min Winter	0.328	0.328	0.3	25.1	Flood Risk
2880 min Winter	0.287	0.287	0.3	21.9	Flood Risk
4320 min Winter	0.210	0.210	0.3	16.0	Flood Risk
5760 min Winter	0.144	0.144	0.3	10.9	O K
7200 min Winter	0.092	0.092	0.3	6.9	O K
8640 min Winter	0.058	0.058	0.3	4.3	O K
10080 min Winter	0.047	0.047	0.3	3.5	O K
Storm Event	Rain (mm/hr)		Flooded Volume (m³)	Time-Peak (mins)	
30 min Winter	84.267		0.0	33	
60 min Winter	54.074		0.0	62	
120 min Winter	33.506		0.0	122	
180 min Winter	24.949		0.0	180	
240 min Winter	20.093		0.0	238	
360 min Winter	14.773		0.0	354	
480 min Winter	11.871		0.0	468	
600 min Winter	10.010		0.0	578	
720 min Winter	8.703		0.0	688	
960 min Winter	6.973		0.0	892	
1440 min Winter	5.093		0.0	1108	
2160 min Winter	3.711		0.0	1556	
2880 min Winter	2.961		0.0	1992	
4320 min Winter	2.150		0.0	2808	
5760 min Winter	1.711		0.0	3528	
7200 min Winter	1.432		0.0	4184	
8640 min Winter	1.240		0.0	4672	
10080 min Winter	1.098		0.0	5240	
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19 - 21 Silvermills Court Henderson Place Lane Edinburgh EH3 5DG	Havant Road, Emsworth SUDs Drainage Car Park 2	
Date 01/03/2017 10:00 File CAR PARK 2.SRCX	Designed by LK/AC Checked by AMF	
Micro Drainage Source Control 2015.1		

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.100	Shortest Storm (mins)	15
Ratio R	0.350	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

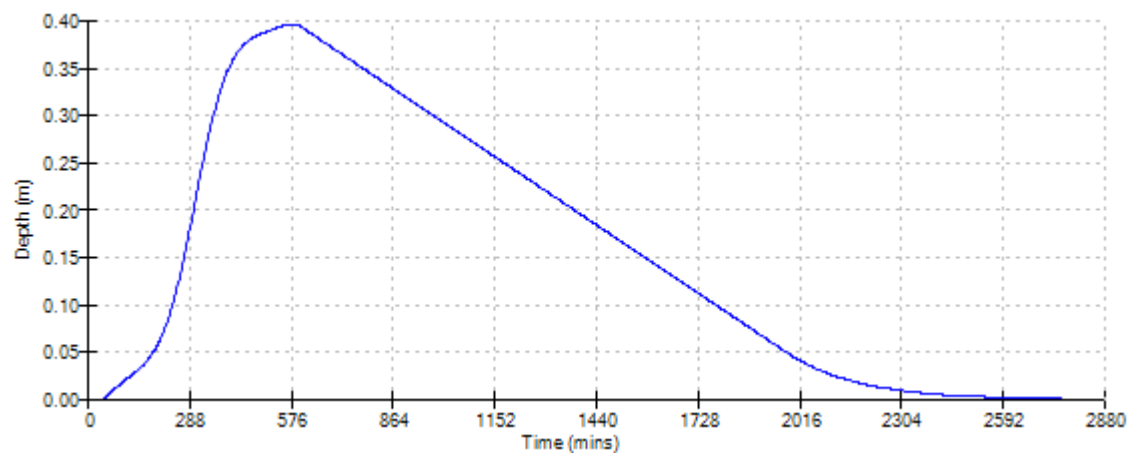
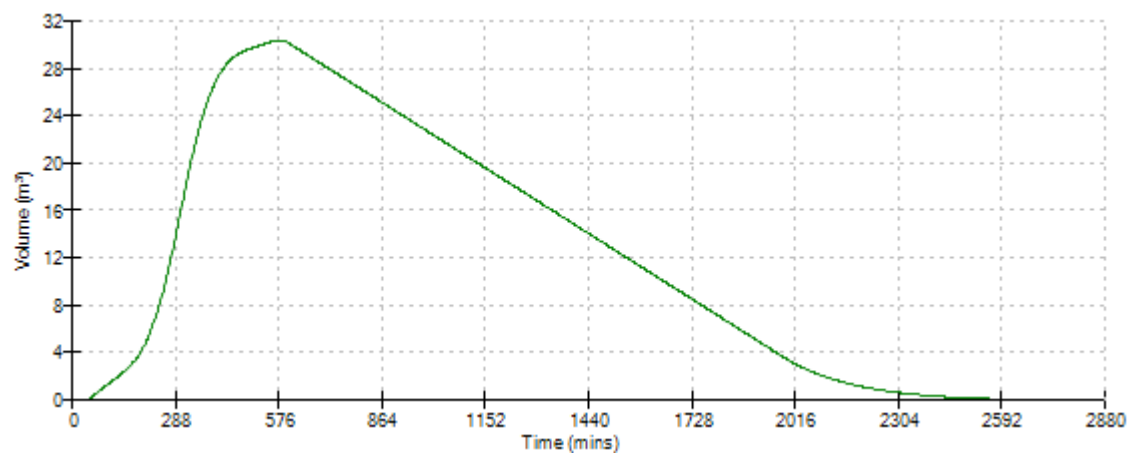
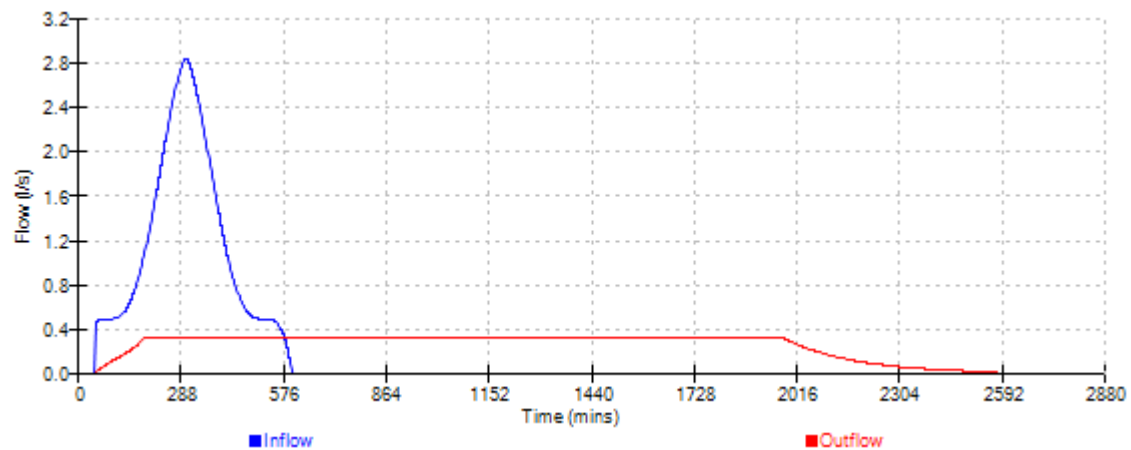
Total Area (ha) 0.048

Time (mins)	Area	Time (mins)	Area
From: To:	(ha)	From: To:	(ha)
0 2	0.024	2 4	0.024

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19 - 21 Silvermills Court Henderson Place Lane Edinburgh EH3 5DG	Havant Road, Emsworth SUDs Drainage Car Park 2																									
Date 01/03/2017 10:00 File CAR PARK 2.SRCX	Designed by LK/AC Checked by AMF																									
Micro Drainage Source Control 2015.1																										
<u>Model Details</u> Storage is Online Cover Level (m) 0.500 <u>Porous Car Park Structure</u> <table> <tr> <td>Infiltration Coefficient Base (m/hr)</td> <td>0.00900</td> <td>Width (m)</td> <td>7.1</td> </tr> <tr> <td>Membrane Percolation (mm/hr)</td> <td>500</td> <td>Length (m)</td> <td>36.1</td> </tr> <tr> <td>Max Percolation (l/s)</td> <td>35.6</td> <td>Slope (1:X)</td> <td>10000.0</td> </tr> <tr> <td>Safety Factor</td> <td>2.0</td> <td>Depression Storage (mm)</td> <td>3</td> </tr> <tr> <td>Porosity</td> <td>0.30</td> <td>Evaporation (mm/day)</td> <td>1</td> </tr> <tr> <td>Invert Level (m)</td> <td>0.000</td> <td>Cap Volume Depth (m)</td> <td>0.400</td> </tr> </table>			Infiltration Coefficient Base (m/hr)	0.00900	Width (m)	7.1	Membrane Percolation (mm/hr)	500	Length (m)	36.1	Max Percolation (l/s)	35.6	Slope (1:X)	10000.0	Safety Factor	2.0	Depression Storage (mm)	3	Porosity	0.30	Evaporation (mm/day)	1	Invert Level (m)	0.000	Cap Volume Depth (m)	0.400
Infiltration Coefficient Base (m/hr)	0.00900	Width (m)	7.1																							
Membrane Percolation (mm/hr)	500	Length (m)	36.1																							
Max Percolation (l/s)	35.6	Slope (1:X)	10000.0																							
Safety Factor	2.0	Depression Storage (mm)	3																							
Porosity	0.30	Evaporation (mm/day)	1																							
Invert Level (m)	0.000	Cap Volume Depth (m)	0.400																							
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Event: 600 min Winter

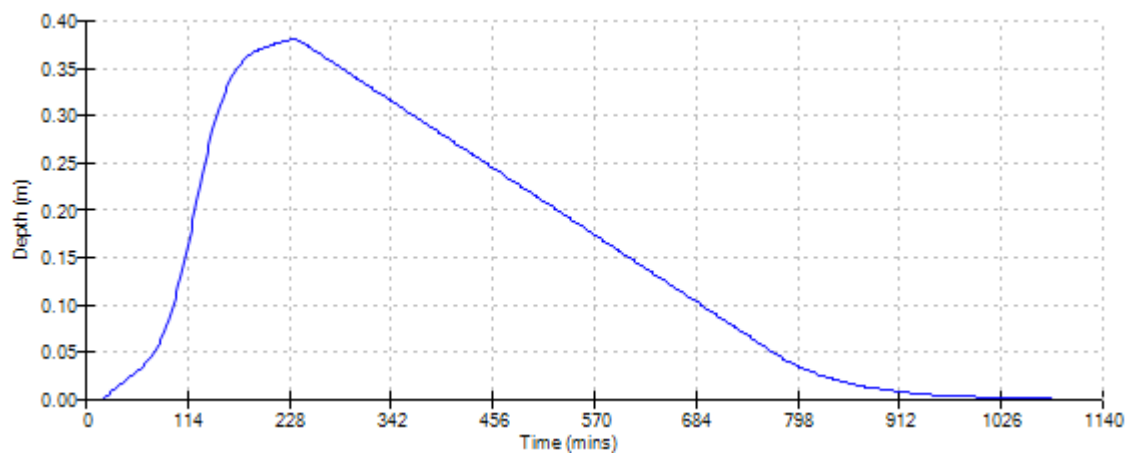
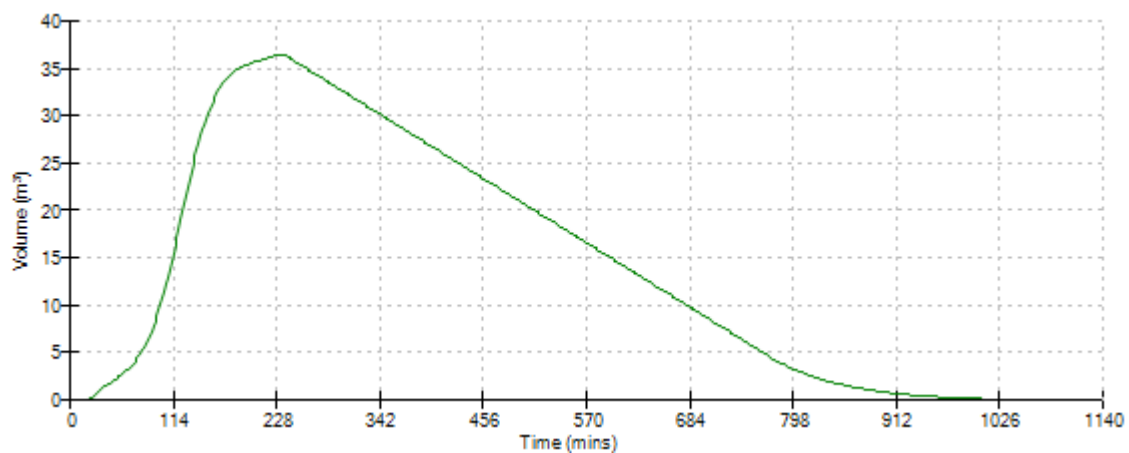
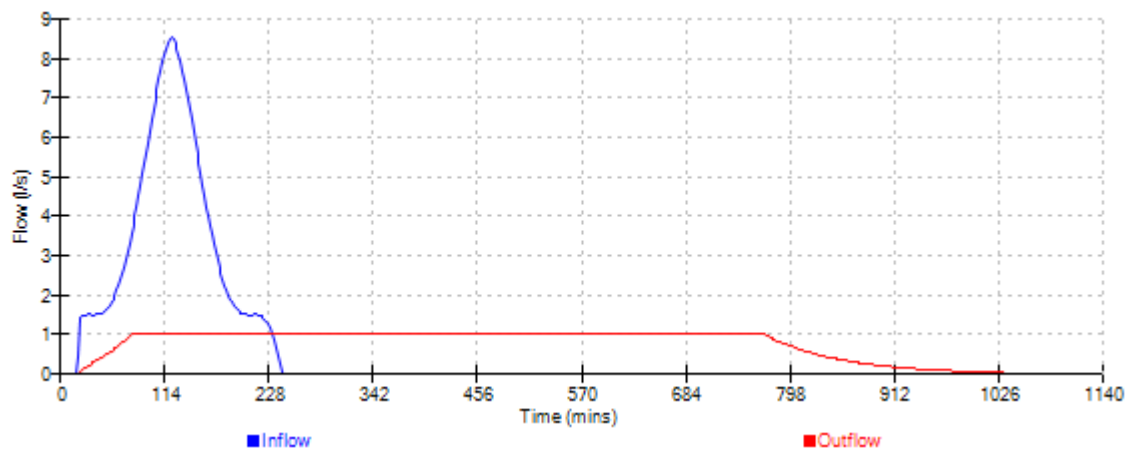


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Summer</td><td>0.315</td><td>0.315</td><td>1.0</td><td>30.1</td><td>Flood Risk</td></tr><tr><td>600 min Summer</td><td>0.306</td><td>0.306</td><td>1.0</td><td>29.3</td><td>Flood Risk</td></tr><tr><td>720 min Summer</td><td>0.297</td><td>0.297</td><td>1.0</td><td>28.3</td><td>Flood Risk</td></tr><tr><td>960 min Summer</td><td>0.276</td><td>0.276</td><td>1.0</td><td>26.3</td><td>Flood Risk</td></tr><tr><td>1440 min Summer</td><td>0.235</td><td>0.235</td><td>1.0</td><td>22.4</td><td>Flood Risk</td></tr><tr><td>2160 min Summer</td><td>0.180</td><td>0.180</td><td>1.0</td><td>17.1</td><td>O K</td></tr><tr><td>2880 min Summer</td><td>0.134</td><td>0.134</td><td>1.0</td><td>12.7</td><td>O K</td></tr><tr><td>4320 min Summer</td><td>0.072</td><td>0.072</td><td>1.0</td><td>6.8</td><td>O K</td></tr><tr><td>5760 min Summer</td><td>0.048</td><td>0.048</td><td>1.0</td><td>4.5</td><td>O K</td></tr><tr><td>7200 min Summer</td><td>0.041</td><td>0.041</td><td>0.8</td><td>3.8</td><td>O 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Volume (m³)	Status	15 min Summer	0.160	0.160	1.0	15.2	O K	30 min Summer	0.214	0.214	1.0	20.4	Flood Risk	60 min Summer	0.267	0.267	1.0	25.5	Flood Risk	120 min Summer	0.311	0.311	1.0	29.7	Flood Risk	180 min Summer	0.325	0.325	1.0	31.1	Flood Risk	240 min Summer	0.327	0.327	1.0	31.2	Flood Risk	360 min Summer	0.322	0.322	1.0	30.8	Flood Risk	480 min Summer	0.315	0.315	1.0	30.1	Flood Risk	600 min Summer	0.306	0.306	1.0	29.3	Flood Risk	720 min Summer	0.297	0.297	1.0	28.3	Flood Risk	960 min Summer	0.276	0.276	1.0	26.3	Flood Risk	1440 min Summer	0.235	0.235	1.0	22.4	Flood Risk	2160 min Summer	0.180	0.180	1.0	17.1	O K	2880 min Summer	0.134	0.134	1.0	12.7	O K	4320 min Summer	0.072	0.072	1.0	6.8	O K	5760 min Summer	0.048	0.048	1.0	4.5	O K	7200 min Summer	0.041	0.041	0.8	3.8	O K	8640 min Summer	0.036	0.036	0.7	3.3	O K	10080 min Summer	0.032	0.032	0.6	2.9	O K	15 min Winter	0.181	0.181	1.0	17.3	O K	Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)	15 min Summer	125.353	0.0	18	30 min Summer	84.267	0.0	33	60 min Summer	54.074	0.0	62	120 min Summer	33.506	0.0	122	180 min Summer	24.949	0.0	180	240 min Summer	20.093	0.0	236	360 min Summer	14.773	0.0	292	480 min Summer	11.871	0.0	354	600 min Summer	10.010	0.0	422	720 min Summer	8.703	0.0	490	960 min Summer	6.973	0.0	626	1440 min Summer	5.093	0.0	894	2160 min Summer	3.711	0.0	1276	2880 min Summer	2.961	0.0	1640	4320 min Summer	2.150	0.0	2292	5760 min Summer	1.711	0.0	2944	7200 min Summer	1.432	0.0	3672	8640 min Summer	1.240	0.0	4408	10080 min Summer	1.098	0.0	5136	15 min Winter	125.353	0.0	18
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19 - 21 Silvermills Court Henderson Place Lane Edinburgh EH3 5DG		Havant Road, Emsworth SUDs Drainage Car Park 3			
Date 01/03/2017 12:32 File CAR PARK 3.SRCX		Designed by LK/AC Checked by AMF			
Micro Drainage		Source Control 2015.1			
<u>Summary of Results for 100 year Return Period (+40%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	0.242	0.242	1.0	23.1	Flood Risk
60 min Winter	0.303	0.303	1.0	29.0	Flood Risk
120 min Winter	0.355	0.355	1.0	34.0	Flood Risk
180 min Winter	0.375	0.375	1.0	35.9	Flood Risk
240 min Winter	0.380	0.380	1.0	36.4	Flood Risk
360 min Winter	0.375	0.375	1.0	35.9	Flood Risk
480 min Winter	0.364	0.364	1.0	34.8	Flood Risk
600 min Winter	0.352	0.352	1.0	33.7	Flood Risk
720 min Winter	0.338	0.338	1.0	32.3	Flood Risk
960 min Winter	0.307	0.307	1.0	29.3	Flood Risk
1440 min Winter	0.244	0.244	1.0	23.2	Flood Risk
2160 min Winter	0.159	0.159	1.0	15.1	O K
2880 min Winter	0.094	0.094	1.0	8.8	O K
4320 min Winter	0.045	0.045	0.9	4.2	O K
5760 min Winter	0.036	0.036	0.7	3.3	O K
7200 min Winter	0.030	0.030	0.6	2.7	O K
8640 min Winter	0.026	0.026	0.5	2.4	O K
10080 min Winter	0.023	0.023	0.5	2.1	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)		
30 min Winter	84.267	0.0	33		
60 min Winter	54.074	0.0	62		
120 min Winter	33.506	0.0	120		
180 min Winter	24.949	0.0	176		
240 min Winter	20.093	0.0	232		
360 min Winter	14.773	0.0	338		
480 min Winter	11.871	0.0	382		
600 min Winter	10.010	0.0	458		
720 min Winter	8.703	0.0	534		
960 min Winter	6.973	0.0	684		
1440 min Winter	5.093	0.0	966		
2160 min Winter	3.711	0.0	1344		
2880 min Winter	2.961	0.0	1676		
4320 min Winter	2.150	0.0	2208		
5760 min Winter	1.711	0.0	2936		
7200 min Winter	1.432	0.0	3680		
8640 min Winter	1.240	0.0	4408		
10080 min Winter	1.098	0.0	5136		
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Date 01/03/2017 12:32 File CAR PARK 3.SRCX	Designed by LK/AC Checked by AMF																									
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<u>Model Details</u> Storage is Online Cover Level (m) 0.500 <u>Porous Car Park Structure</u> <table> <tr> <td>Infiltration Coefficient Base (m/hr)</td> <td>0.02232</td> <td>Width (m)</td> <td>9.5</td> </tr> <tr> <td>Membrane Percolation (mm/hr)</td> <td>500</td> <td>Length (m)</td> <td>33.7</td> </tr> <tr> <td>Max Percolation (l/s)</td> <td>44.5</td> <td>Slope (1:X)</td> <td>10000.0</td> </tr> <tr> <td>Safety Factor</td> <td>2.0</td> <td>Depression Storage (mm)</td> <td>3</td> </tr> <tr> <td>Porosity</td> <td>0.30</td> <td>Evaporation (mm/day)</td> <td>1</td> </tr> <tr> <td>Invert Level (m)</td> <td>0.000</td> <td>Cap Volume Depth (m)</td> <td>0.400</td> </tr> </table>			Infiltration Coefficient Base (m/hr)	0.02232	Width (m)	9.5	Membrane Percolation (mm/hr)	500	Length (m)	33.7	Max Percolation (l/s)	44.5	Slope (1:X)	10000.0	Safety Factor	2.0	Depression Storage (mm)	3	Porosity	0.30	Evaporation (mm/day)	1	Invert Level (m)	0.000	Cap Volume Depth (m)	0.400
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Event: 240 min Winter



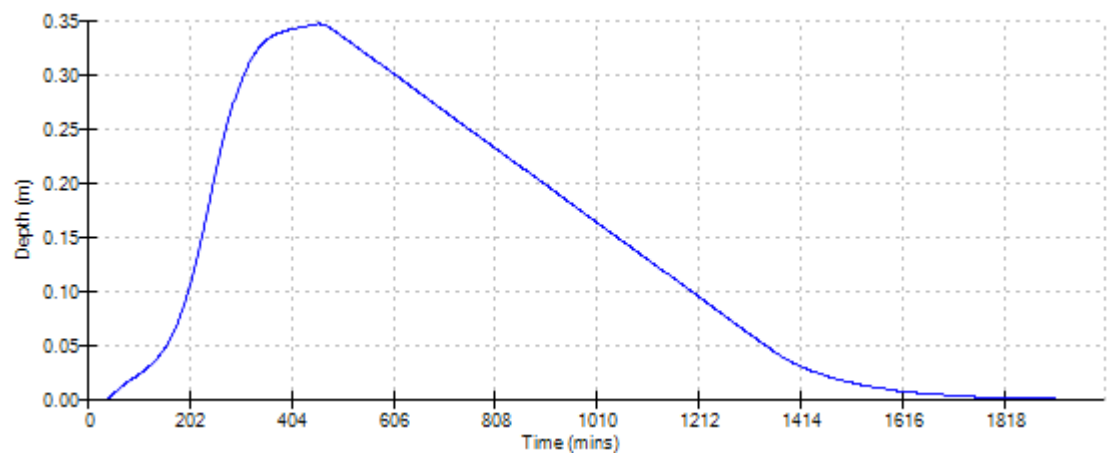
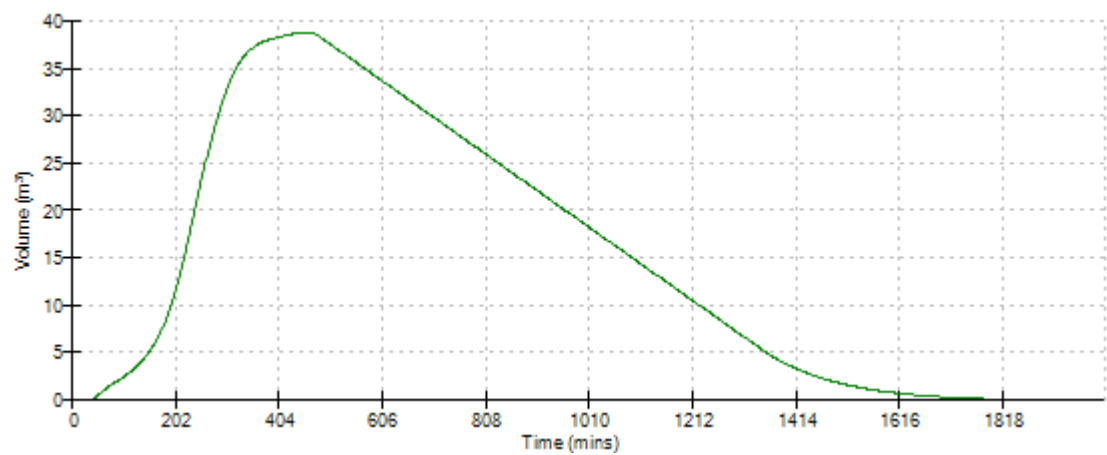
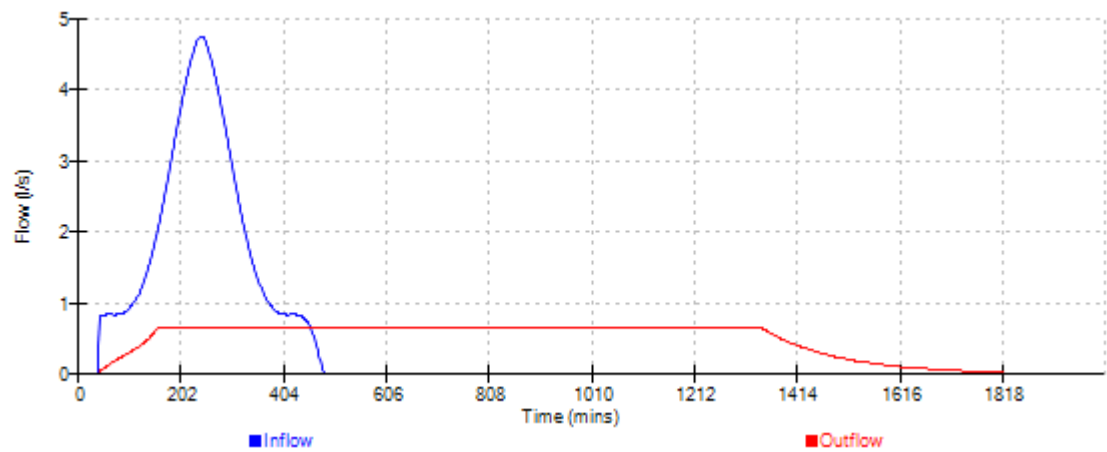
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Date 01/03/2017 13:43 File CAR PARK 4.SRCX		Designed by LK/AC Checked by AMF			
Micro Drainage		Source Control 2015.1			
<u>Summary of Results for 100 year Return Period (+40%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	0.198	0.198	0.6	22.1	Flood Risk
60 min Winter	0.251	0.251	0.6	28.0	Flood Risk
120 min Winter	0.301	0.301	0.6	33.6	Flood Risk
180 min Winter	0.324	0.324	0.6	36.3	Flood Risk
240 min Winter	0.336	0.336	0.6	37.6	Flood Risk
360 min Winter	0.346	0.346	0.6	38.8	Flood Risk
480 min Winter	0.347	0.347	0.6	38.8	Flood Risk
600 min Winter	0.342	0.342	0.6	38.3	Flood Risk
720 min Winter	0.336	0.336	0.6	37.6	Flood Risk
960 min Winter	0.323	0.323	0.6	36.1	Flood Risk
1440 min Winter	0.289	0.289	0.6	32.3	Flood Risk
2160 min Winter	0.236	0.236	0.6	26.3	Flood Risk
2880 min Winter	0.186	0.186	0.6	20.7	Flood Risk
4320 min Winter	0.104	0.104	0.6	11.5	O K
5760 min Winter	0.055	0.055	0.6	5.9	O K
7200 min Winter	0.044	0.044	0.6	4.7	O K
8640 min Winter	0.038	0.038	0.5	4.1	O K
10080 min Winter	0.034	0.034	0.4	3.6	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)		
30 min Winter	84.267	0.0	33		
60 min Winter	54.074	0.0	62		
120 min Winter	33.506	0.0	120		
180 min Winter	24.949	0.0	178		
240 min Winter	20.093	0.0	236		
360 min Winter	14.773	0.0	350		
480 min Winter	11.871	0.0	458		
600 min Winter	10.010	0.0	560		
720 min Winter	8.703	0.0	586		
960 min Winter	6.973	0.0	732		
1440 min Winter	5.093	0.0	1038		
2160 min Winter	3.711	0.0	1468		
2880 min Winter	2.961	0.0	1872		
4320 min Winter	2.150	0.0	2556		
5760 min Winter	1.711	0.0	3112		
7200 min Winter	1.432	0.0	3736		
8640 min Winter	1.240	0.0	4416		
10080 min Winter	1.098	0.0	5152		
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Event: 480 min Winter



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Summer	0.112	0.112	1.2	13.2	Flood Risk	60 min Summer	0.137	0.137	1.2	16.2	Flood Risk	120 min Summer	0.153	0.153	1.2	18.1	Flood Risk	180 min Summer	0.156	0.156	1.2	18.5	Flood Risk	240 min Summer	0.155	0.155	1.2	18.4	Flood Risk	360 min Summer	0.150	0.150	1.2	17.8	Flood Risk	480 min Summer	0.143	0.143	1.2	16.9	Flood Risk	600 min Summer	0.134	0.134	1.2	15.9	Flood Risk	720 min Summer	0.126	0.126	1.2	14.9	Flood Risk	960 min Summer	0.109	0.109	1.2	12.9	Flood Risk	1440 min Summer	0.081	0.081	1.2	9.6	O K	2160 min Summer	0.055	0.055	1.2	6.4	O K	2880 min Summer	0.045	0.045	1.1	5.2	O K	4320 min Summer	0.034	0.034	0.8	3.9	O K	5760 min Summer	0.028	0.028	0.7	3.1	O K	7200 min Summer	0.024	0.024	0.6	2.6	O K	8640 min Summer	0.021	0.021	0.5	2.3	O K	10080 min Summer	0.018	0.018	0.4	2.0	O K	15 min Winter	0.095	0.095	1.2	11.2	O K	Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)	15 min Summer	125.353	0.0	18	30 min Summer	84.267	0.0	32	60 min Summer	54.074	0.0	62	120 min Summer	33.506	0.0	116	180 min Summer	24.949	0.0	146	240 min Summer	20.093	0.0	176	360 min Summer	14.773	0.0	244	480 min Summer	11.871	0.0	312	600 min Summer	10.010	0.0	380	720 min Summer	8.703	0.0	448	960 min Summer	6.973	0.0	576	1440 min Summer	5.093	0.0	820	2160 min Summer	3.711	0.0	1148	2880 min Summer	2.961	0.0	1496	4320 min Summer	2.150	0.0	2208	5760 min Summer	1.711	0.0	2944	7200 min Summer	1.432	0.0	3672	8640 min Summer	1.240	0.0	4408	10080 min Summer	1.098	0.0	5136	15 min Winter	125.353	0.0	18
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Cundall, Johnston & Partners				Page 2	
19 - 21 Silvermills Court		Havant Road, Emsworth			
Henderson Place Lane		SUDs Drainage			
Edinburgh EH3 5DG		Car Park 5			
Date 01/03/2017 14:19		Designed by LK/AC			
File CAR PARK 5.SRCX		Checked by AMF			
Micro Drainage		Source Control 2015.1			
<u>Summary of Results for 100 year Return Period (+40%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	0.127	0.127	1.2	15.0	Flood Risk
60 min Winter	0.156	0.156	1.2	18.6	Flood Risk
120 min Winter	0.177	0.177	1.2	21.0	Flood Risk
180 min Winter	0.179	0.179	1.2	21.3	Flood Risk
240 min Winter	0.177	0.177	1.2	21.0	Flood Risk
360 min Winter	0.169	0.169	1.2	20.0	Flood Risk
480 min Winter	0.157	0.157	1.2	18.6	Flood Risk
600 min Winter	0.143	0.143	1.2	17.0	Flood Risk
720 min Winter	0.130	0.130	1.2	15.4	Flood Risk
960 min Winter	0.105	0.105	1.2	12.3	Flood Risk
1440 min Winter	0.065	0.065	1.2	7.6	O K
2160 min Winter	0.043	0.043	1.0	5.0	O K
2880 min Winter	0.035	0.035	0.8	4.0	O K
4320 min Winter	0.026	0.026	0.6	2.9	O K
5760 min Winter	0.021	0.021	0.5	2.3	O K
7200 min Winter	0.017	0.017	0.4	1.9	O K
8640 min Winter	0.015	0.015	0.4	1.6	O K
10080 min Winter	0.013	0.013	0.3	1.4	O K
Storm Event	Rain (mm/hr)		Flooded Volume (m³)	Time-Peak (mins)	
30 min Winter	84.267		0.0	32	
60 min Winter	54.074		0.0	60	
120 min Winter	33.506		0.0	116	
180 min Winter	24.949		0.0	168	
240 min Winter	20.093		0.0	190	
360 min Winter	14.773		0.0	266	
480 min Winter	11.871		0.0	342	
600 min Winter	10.010		0.0	414	
720 min Winter	8.703		0.0	482	
960 min Winter	6.973		0.0	614	
1440 min Winter	5.093		0.0	838	
2160 min Winter	3.711		0.0	1148	
2880 min Winter	2.961		0.0	1500	
4320 min Winter	2.150		0.0	2248	
5760 min Winter	1.711		0.0	2944	
7200 min Winter	1.432		0.0	3680	
8640 min Winter	1.240		0.0	4424	
10080 min Winter	1.098		0.0	5144	
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Cundall, Johnston & Partners		Page 3
19 - 21 Silvermills Court Henderson Place Lane Edinburgh EH3 5DG	Havant Road, Emsworth SUDs Drainage Car Park 5	
Date 01/03/2017 14:19 File CAR PARK 5.SRCX	Designed by LK/AC Checked by AMF	
Micro Drainage Source Control 2015.1		

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.100	Shortest Storm (mins)	15
Ratio R	0.350	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

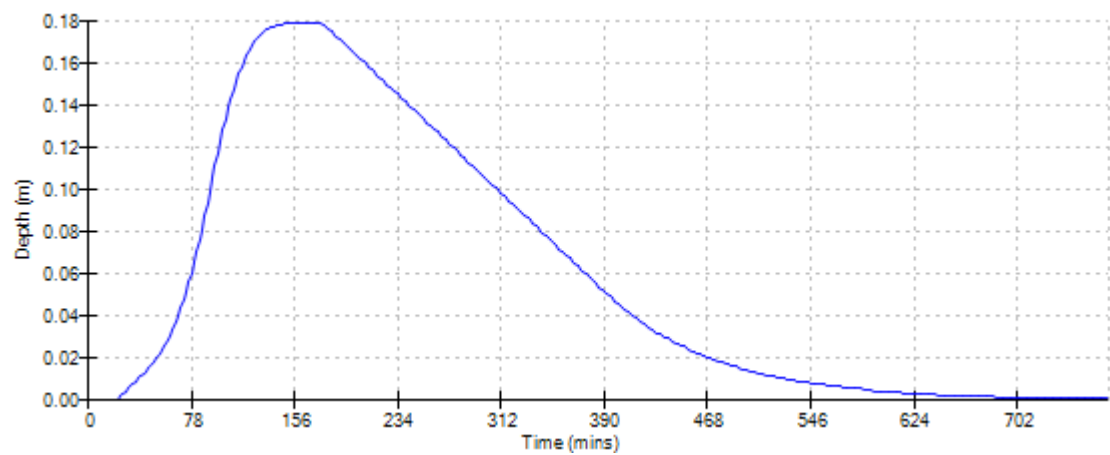
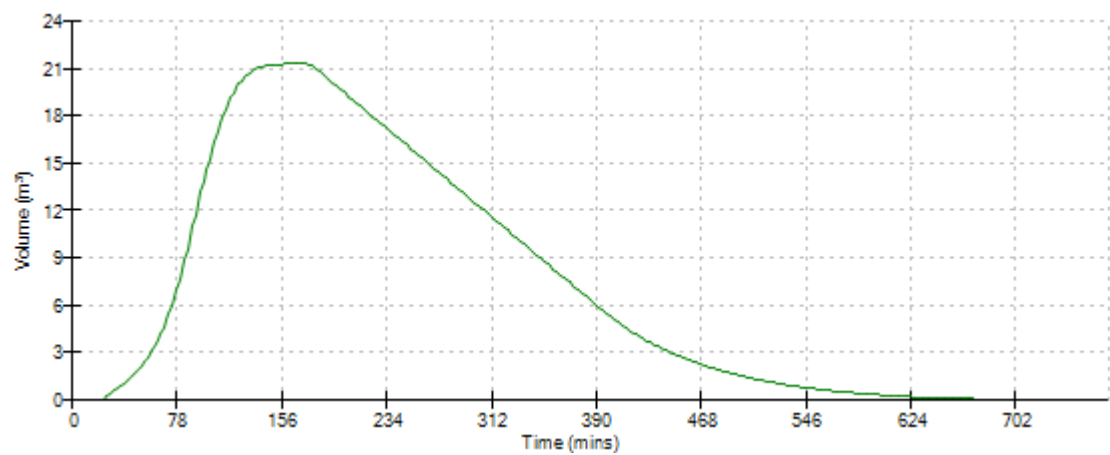
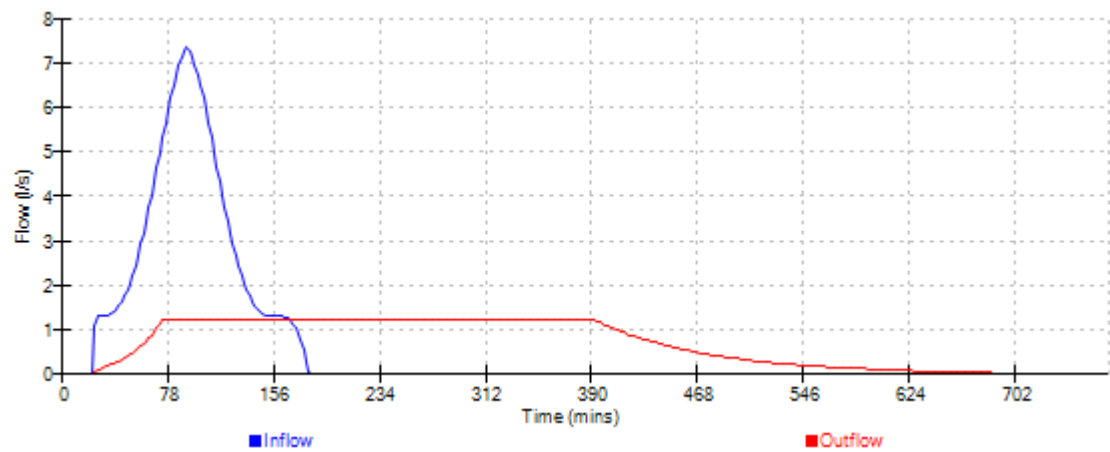
Total Area (ha) 0.050

Time (mins)	Area	Time (mins)	Area
From: To:	(ha)	From: To:	(ha)
0 2	0.025	2 4	0.025

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<u>Model Details</u> Storage is Online Cover Level (m) 0.400 <u>Porous Car Park Structure</u> <table> <tr> <td>Infiltration Coefficient Base (m/hr)</td> <td>0.02160</td> <td>Width (m)</td> <td>13.4</td> </tr> <tr> <td>Membrane Percolation (mm/hr)</td> <td>500</td> <td>Length (m)</td> <td>29.8</td> </tr> <tr> <td>Max Percolation (l/s)</td> <td>55.5</td> <td>Slope (1:X)</td> <td>10000.0</td> </tr> <tr> <td>Safety Factor</td> <td>2.0</td> <td>Depression Storage (mm)</td> <td>3</td> </tr> <tr> <td>Porosity</td> <td>0.30</td> <td>Evaporation (mm/day)</td> <td>1</td> </tr> <tr> <td>Invert Level (m)</td> <td>0.000</td> <td>Cap Volume Depth (m)</td> <td>0.300</td> </tr> </table>			Infiltration Coefficient Base (m/hr)	0.02160	Width (m)	13.4	Membrane Percolation (mm/hr)	500	Length (m)	29.8	Max Percolation (l/s)	55.5	Slope (1:X)	10000.0	Safety Factor	2.0	Depression Storage (mm)	3	Porosity	0.30	Evaporation (mm/day)	1	Invert Level (m)	0.000	Cap Volume Depth (m)	0.300
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Event: 180 min Winter



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Summer</td><td>0.021</td><td>0.021</td><td>0.5</td><td>2.3</td><td>O K</td></tr><tr><td>10080 min Summer</td><td>0.019</td><td>0.019</td><td>0.4</td><td>2.0</td><td>O K</td></tr><tr><td>15 min Winter</td><td>0.097</td><td>0.097</td><td>1.2</td><td>11.5</td><td>O K</td></tr></tbody></table> <table><thead><tr><th>Storm Event</th><th>Rain (mm/hr)</th><th>Flooded Volume (m³)</th><th>Time-Peak (mins)</th></tr></thead><tbody><tr><td>15 min Summer</td><td>125.353</td><td>0.0</td><td>18</td></tr><tr><td>30 min Summer</td><td>84.267</td><td>0.0</td><td>32</td></tr><tr><td>60 min Summer</td><td>54.074</td><td>0.0</td><td>62</td></tr><tr><td>120 min Summer</td><td>33.506</td><td>0.0</td><td>118</td></tr><tr><td>180 min Summer</td><td>24.949</td><td>0.0</td><td>146</td></tr><tr><td>240 min Summer</td><td>20.093</td><td>0.0</td><td>178</td></tr><tr><td>360 min Summer</td><td>14.773</td><td>0.0</td><td>246</td></tr><tr><td>480 min Summer</td><td>11.871</td><td>0.0</td><td>314</td></tr><tr><td>600 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Summer	0.114	0.114	1.2	13.5	O K	60 min Summer	0.140	0.140	1.2	16.6	O K	120 min Summer	0.157	0.157	1.2	18.6	Flood Risk	180 min Summer	0.160	0.160	1.2	19.0	Flood Risk	240 min Summer	0.159	0.159	1.2	18.9	Flood Risk	360 min Summer	0.154	0.154	1.2	18.3	Flood Risk	480 min Summer	0.147	0.147	1.2	17.4	O K	600 min Summer	0.138	0.138	1.2	16.4	O K	720 min Summer	0.130	0.130	1.2	15.4	O K	960 min Summer	0.113	0.113	1.2	13.4	O K	1440 min Summer	0.085	0.085	1.2	9.9	O K	2160 min Summer	0.057	0.057	1.2	6.6	O K	2880 min Summer	0.045	0.045	1.1	5.3	O K	4320 min Summer	0.035	0.035	0.8	4.0	O K	5760 min Summer	0.028	0.028	0.7	3.2	O K	7200 min Summer	0.024	0.024	0.6	2.7	O K	8640 min Summer	0.021	0.021	0.5	2.3	O K	10080 min Summer	0.019	0.019	0.4	2.0	O K	15 min Winter	0.097	0.097	1.2	11.5	O K	Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)	15 min Summer	125.353	0.0	18	30 min Summer	84.267	0.0	32	60 min Summer	54.074	0.0	62	120 min Summer	33.506	0.0	118	180 min Summer	24.949	0.0	146	240 min Summer	20.093	0.0	178	360 min Summer	14.773	0.0	246	480 min Summer	11.871	0.0	314	600 min Summer	10.010	0.0	382	720 min Summer	8.703	0.0	448	960 min Summer	6.973	0.0	578	1440 min Summer	5.093	0.0	822	2160 min Summer	3.711	0.0	1148	2880 min Summer	2.961	0.0	1500	4320 min Summer	2.150	0.0	2208	5760 min Summer	1.711	0.0	2944	7200 min Summer	1.432	0.0	3672	8640 min Summer	1.240	0.0	4408	10080 min Summer	1.098	0.0	5136	15 min Winter	125.353	0.0	18
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19 - 21 Silvermills Court Henderson Place Lane Edinburgh EH3 5DG		Havant Road, Emsworth SUDs Drainage Car Park 6			
Date 01/03/2017 14:53 File CAR PARK 6.SRCX		Designed by LK/AC Checked by AMF			
Micro Drainage		Source Control 2015.1			
<u>Summary of Results for 100 year Return Period (+40%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	0.130	0.130	1.2	15.4	O K
60 min Winter	0.160	0.160	1.2	19.0	Flood Risk
120 min Winter	0.181	0.181	1.2	21.5	Flood Risk
180 min Winter	0.184	0.184	1.2	21.9	Flood Risk
240 min Winter	0.182	0.182	1.2	21.6	Flood Risk
360 min Winter	0.173	0.173	1.2	20.6	Flood Risk
480 min Winter	0.162	0.162	1.2	19.2	Flood Risk
600 min Winter	0.148	0.148	1.2	17.6	O K
720 min Winter	0.135	0.135	1.2	16.0	O K
960 min Winter	0.109	0.109	1.2	12.9	O K
1440 min Winter	0.068	0.068	1.2	7.9	O K
2160 min Winter	0.044	0.044	1.1	5.1	O K
2880 min Winter	0.036	0.036	0.9	4.1	O K
4320 min Winter	0.026	0.026	0.6	3.0	O K
5760 min Winter	0.021	0.021	0.5	2.3	O K
7200 min Winter	0.018	0.018	0.4	1.9	O K
8640 min Winter	0.015	0.015	0.4	1.7	O K
10080 min Winter	0.014	0.014	0.3	1.4	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)		
30 min Winter	84.267	0.0	32		
60 min Winter	54.074	0.0	60		
120 min Winter	33.506	0.0	116		
180 min Winter	24.949	0.0	170		
240 min Winter	20.093	0.0	192		
360 min Winter	14.773	0.0	268		
480 min Winter	11.871	0.0	342		
600 min Winter	10.010	0.0	416		
720 min Winter	8.703	0.0	484		
960 min Winter	6.973	0.0	616		
1440 min Winter	5.093	0.0	840		
2160 min Winter	3.711	0.0	1148		
2880 min Winter	2.961	0.0	1524		
4320 min Winter	2.150	0.0	2248		
5760 min Winter	1.711	0.0	2936		
7200 min Winter	1.432	0.0	3672		
8640 min Winter	1.240	0.0	4416		
10080 min Winter	1.098	0.0	5072		
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19 - 21 Silvermills Court Henderson Place Lane Edinburgh EH3 5DG	Havant Road, Emsworth SUDs Drainage Car Park 6	
Date 01/03/2017 14:53 File CAR PARK 6.SRCX	Designed by LK/AC Checked by AMF	
Micro Drainage		Source Control 2015.1

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.100	Shortest Storm (mins)	15
Ratio R	0.350	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

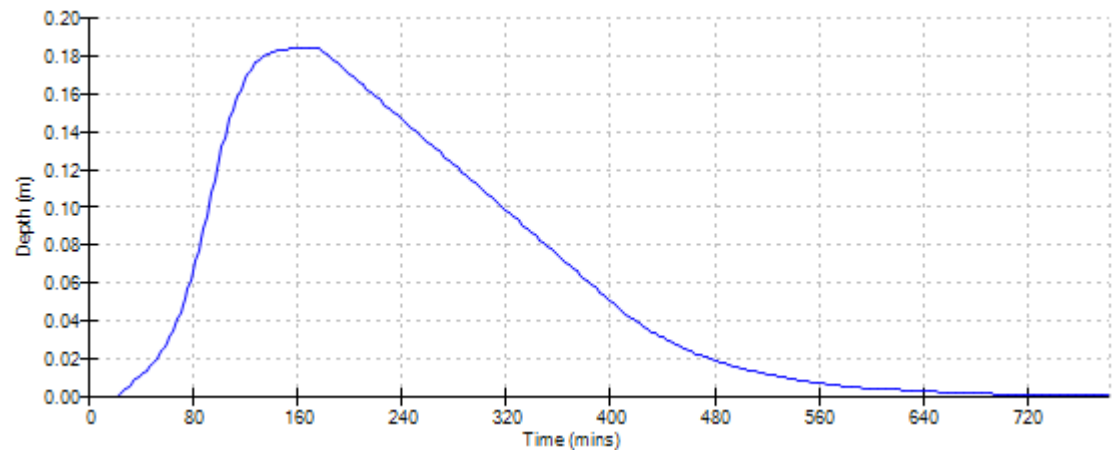
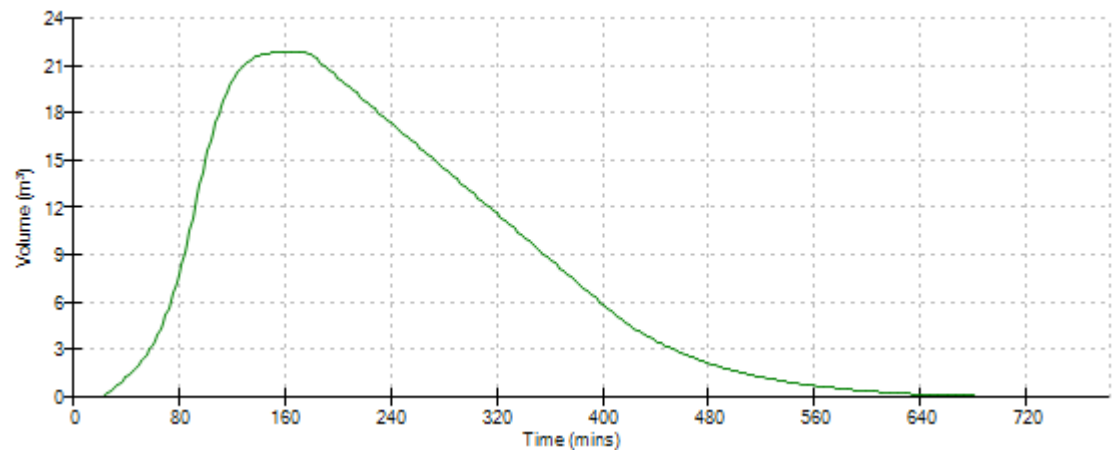
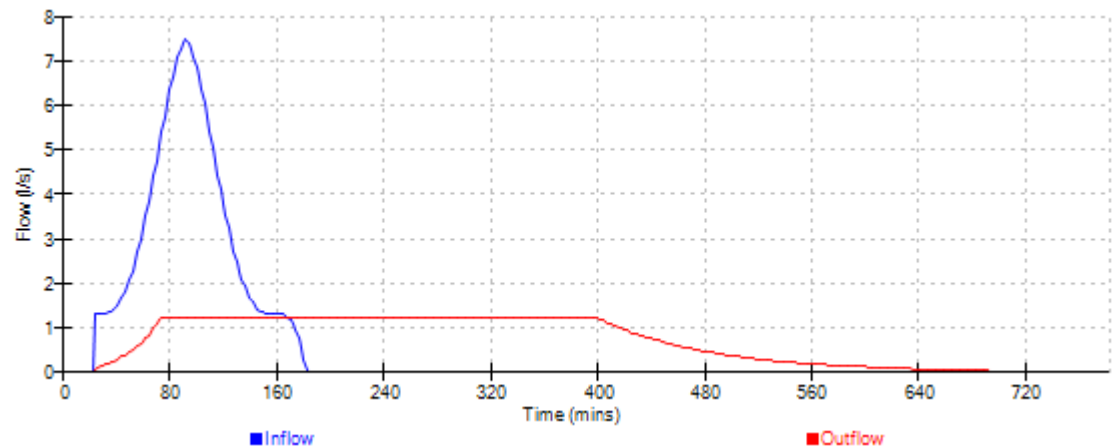
Time Area Diagram

Total Area (ha) 0.051

Time (mins)	Area	Time (mins)	Area
From:	To: (ha)	From:	To: (ha)
0	2 0.026	2	4 0.025

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19 - 21 Silvermills Court Henderson Place Lane Edinburgh EH3 5DG	Havant Road, Emsworth SUDs Drainage Car Park 6																									
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<u>Model Details</u> Storage is Online Cover Level (m) 0.450 <u>Porous Car Park Structure</u> <table> <tr> <td>Infiltration Coefficient Base (m/hr)</td> <td>0.02160</td> <td>Width (m)</td> <td>13.4</td> </tr> <tr> <td>Membrane Percolation (mm/hr)</td> <td>500</td> <td>Length (m)</td> <td>29.8</td> </tr> <tr> <td>Max Percolation (l/s)</td> <td>55.5</td> <td>Slope (1:X)</td> <td>10000.0</td> </tr> <tr> <td>Safety Factor</td> <td>2.0</td> <td>Depression Storage (mm)</td> <td>3</td> </tr> <tr> <td>Porosity</td> <td>0.30</td> <td>Evaporation (mm/day)</td> <td>1</td> </tr> <tr> <td>Invert Level (m)</td> <td>0.000</td> <td>Cap Volume Depth (m)</td> <td>0.350</td> </tr> </table>			Infiltration Coefficient Base (m/hr)	0.02160	Width (m)	13.4	Membrane Percolation (mm/hr)	500	Length (m)	29.8	Max Percolation (l/s)	55.5	Slope (1:X)	10000.0	Safety Factor	2.0	Depression Storage (mm)	3	Porosity	0.30	Evaporation (mm/day)	1	Invert Level (m)	0.000	Cap Volume Depth (m)	0.350
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Event: 180 min Winter



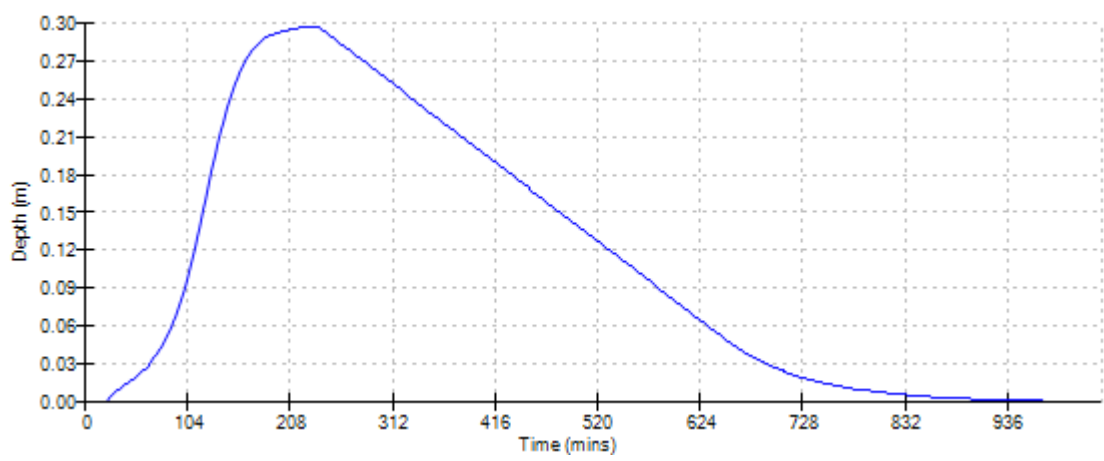
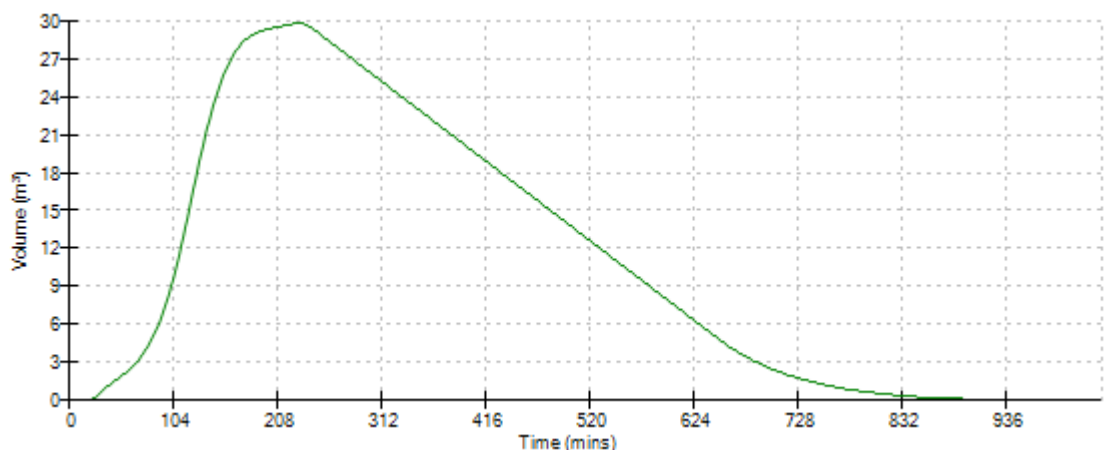
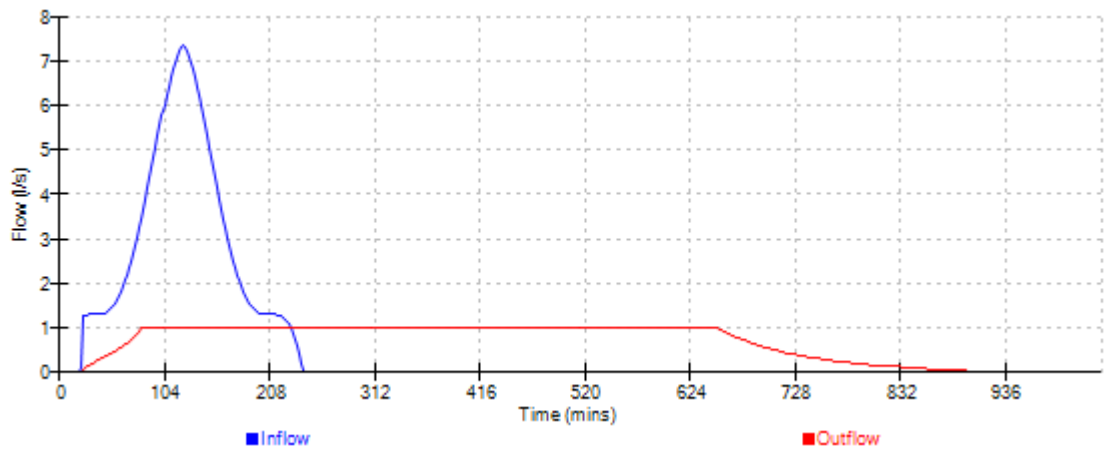
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19 - 21 Silvermills Court Henderson Place Lane Edinburgh EH3 5DG		Havant Road, Emsworth SUDs Drainage Car Park 7			
Date 01/03/2017 14:38 File Car Park 7.srcx		Designed by LK/AC Checked by AMF			
Micro Drainage		Source Control 2015.1			
<u>Summary of Results for 100 year Return Period (+40%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	0.196	0.196	1.0	19.6	Flood Risk
60 min Winter	0.244	0.244	1.0	24.4	Flood Risk
120 min Winter	0.283	0.283	1.0	28.4	Flood Risk
180 min Winter	0.296	0.296	1.0	29.7	Flood Risk
240 min Winter	0.297	0.297	1.0	29.8	Flood Risk
360 min Winter	0.289	0.289	1.0	29.0	Flood Risk
480 min Winter	0.279	0.279	1.0	28.0	Flood Risk
600 min Winter	0.267	0.267	1.0	26.7	Flood Risk
720 min Winter	0.252	0.252	1.0	25.3	Flood Risk
960 min Winter	0.222	0.222	1.0	22.2	Flood Risk
1440 min Winter	0.165	0.165	1.0	16.4	Flood Risk
2160 min Winter	0.095	0.095	1.0	9.4	O K
2880 min Winter	0.053	0.053	1.0	5.2	O K
4320 min Winter	0.038	0.038	0.8	3.6	O K
5760 min Winter	0.031	0.031	0.6	2.9	O K
7200 min Winter	0.026	0.026	0.5	2.3	O K
8640 min Winter	0.022	0.022	0.4	2.0	O K
10080 min Winter	0.020	0.020	0.4	1.7	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)		
30 min Winter	84.267	0.0	32		
60 min Winter	54.074	0.0	62		
120 min Winter	33.506	0.0	118		
180 min Winter	24.949	0.0	176		
240 min Winter	20.093	0.0	230		
360 min Winter	14.773	0.0	292		
480 min Winter	11.871	0.0	366		
600 min Winter	10.010	0.0	442		
720 min Winter	8.703	0.0	518		
960 min Winter	6.973	0.0	664		
1440 min Winter	5.093	0.0	936		
2160 min Winter	3.711	0.0	1280		
2880 min Winter	2.961	0.0	1556		
4320 min Winter	2.150	0.0	2208		
5760 min Winter	1.711	0.0	2936		
7200 min Winter	1.432	0.0	3624		
8640 min Winter	1.240	0.0	4400		
10080 min Winter	1.098	0.0	5040		
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Event: 240 min Winter

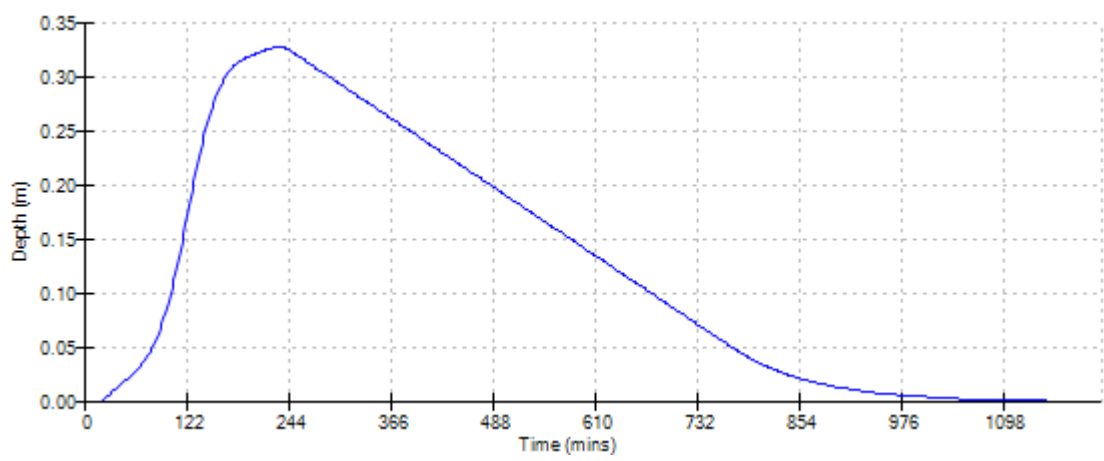
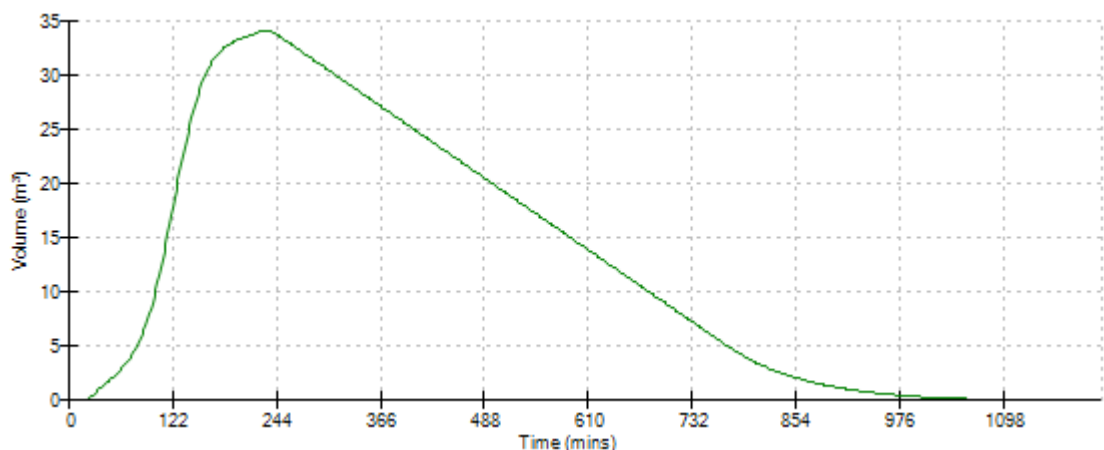
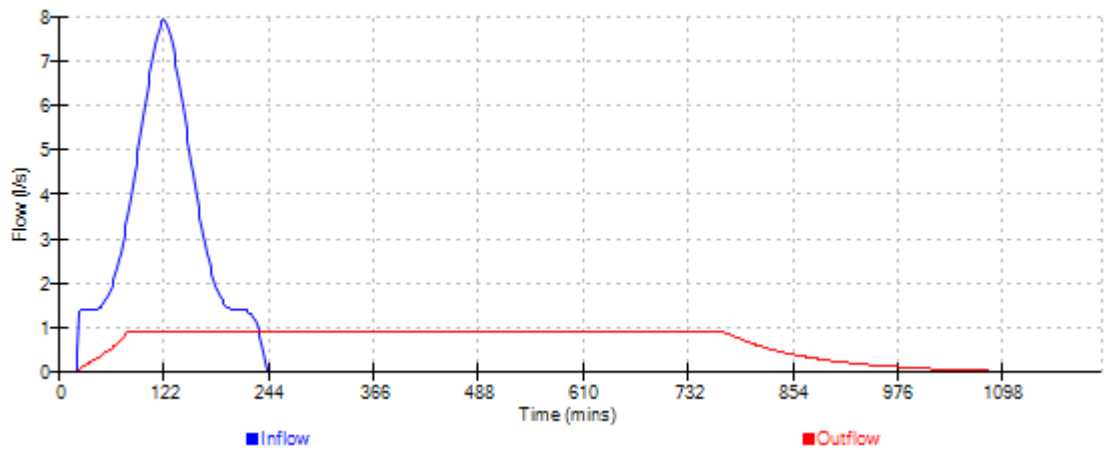


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Summer</td><td>11.871</td><td>0.0</td><td>358</td></tr><tr><td>600 min Summer</td><td>10.010</td><td>0.0</td><td>422</td></tr><tr><td>720 min Summer</td><td>8.703</td><td>0.0</td><td>492</td></tr><tr><td>960 min Summer</td><td>6.973</td><td>0.0</td><td>626</td></tr><tr><td>1440 min Summer</td><td>5.093</td><td>0.0</td><td>896</td></tr><tr><td>2160 min Summer</td><td>3.711</td><td>0.0</td><td>1276</td></tr><tr><td>2880 min Summer</td><td>2.961</td><td>0.0</td><td>1644</td></tr><tr><td>4320 min Summer</td><td>2.150</td><td>0.0</td><td>2296</td></tr><tr><td>5760 min Summer</td><td>1.711</td><td>0.0</td><td>2944</td></tr><tr><td>7200 min Summer</td><td>1.432</td><td>0.0</td><td>3672</td></tr><tr><td>8640 min Summer</td><td>1.240</td><td>0.0</td><td>4408</td></tr><tr><td>10080 min Summer</td><td>1.098</td><td>0.0</td><td>5144</td></tr><tr><td>15 min Winter</td><td>125.353</td><td>0.0</td><td>18</td></tr></tbody></table>						Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status	15 min Summer	0.137	0.137	0.9	14.1	O K	30 min Summer	0.183	0.183	0.9	18.9	Flood Risk	60 min Summer	0.229	0.229	0.9	23.7	Flood Risk	120 min Summer	0.267	0.267	0.9	27.7	Flood Risk	180 min Summer	0.280	0.280	0.9	29.1	Flood Risk	240 min Summer	0.283	0.283	0.9	29.4	Flood Risk	360 min Summer	0.280	0.280	0.9	29.1	Flood Risk	480 min Summer	0.275	0.275	0.9	28.5	Flood Risk	600 min Summer	0.268	0.268	0.9	27.8	Flood Risk	720 min Summer	0.260	0.260	0.9	27.0	Flood Risk	960 min Summer	0.243	0.243	0.9	25.2	Flood Risk	1440 min Summer	0.209	0.209	0.9	21.7	Flood Risk	2160 min Summer	0.163	0.163	0.9	16.8	Flood Risk	2880 min Summer	0.124	0.124	0.9	12.7	O K	4320 min Summer	0.071	0.071	0.9	7.2	O K	5760 min Summer	0.049	0.049	0.9	4.9	O K	7200 min Summer	0.041	0.041	0.7	4.1	O K	8640 min Summer	0.036	0.036	0.7	3.6	O K	10080 min Summer	0.032	0.032	0.6	3.2	O K	15 min Winter	0.154	0.154	0.9	15.9	Flood Risk	Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)	15 min Summer	125.353	0.0	18	30 min Summer	84.267	0.0	33	60 min Summer	54.074	0.0	62	120 min Summer	33.506	0.0	122	180 min Summer	24.949	0.0	180	240 min Summer	20.093	0.0	240	360 min Summer	14.773	0.0	294	480 min Summer	11.871	0.0	358	600 min Summer	10.010	0.0	422	720 min Summer	8.703	0.0	492	960 min Summer	6.973	0.0	626	1440 min Summer	5.093	0.0	896	2160 min Summer	3.711	0.0	1276	2880 min Summer	2.961	0.0	1644	4320 min Summer	2.150	0.0	2296	5760 min Summer	1.711	0.0	2944	7200 min Summer	1.432	0.0	3672	8640 min Summer	1.240	0.0	4408	10080 min Summer	1.098	0.0	5144	15 min Winter	125.353	0.0	18
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Cundall, Johnston & Partners				Page 2	
19 - 21 Silvermills Court		Havant Road, Emsworth			
Henderson Place Lane		SUDs Drainage			
Edinburgh EH3 5DG		Car Park 8			
Date 01/03/2017 16:18		Designed by LK/AC			
File Car Park 8.srcx		Checked by AMF			
Micro Drainage		Source Control 2015.1			
<u>Summary of Results for 100 year Return Period (+40%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	0.207	0.207	0.9	21.4	Flood Risk
60 min Winter	0.259	0.259	0.9	26.9	Flood Risk
120 min Winter	0.305	0.305	0.9	31.7	Flood Risk
180 min Winter	0.323	0.323	0.9	33.5	Flood Risk
240 min Winter	0.328	0.328	0.9	34.1	Flood Risk
360 min Winter	0.326	0.326	0.9	33.8	Flood Risk
480 min Winter	0.317	0.317	0.9	32.9	Flood Risk
600 min Winter	0.307	0.307	0.9	31.9	Flood Risk
720 min Winter	0.296	0.296	0.9	30.8	Flood Risk
960 min Winter	0.271	0.271	0.9	28.1	Flood Risk
1440 min Winter	0.218	0.218	0.9	22.6	Flood Risk
2160 min Winter	0.147	0.147	0.9	15.1	O K
2880 min Winter	0.091	0.091	0.9	9.3	O K
4320 min Winter	0.046	0.046	0.8	4.6	O K
5760 min Winter	0.037	0.037	0.7	3.6	O K
7200 min Winter	0.031	0.031	0.6	3.0	O K
8640 min Winter	0.027	0.027	0.5	2.6	O K
10080 min Winter	0.024	0.024	0.4	2.3	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)		
30 min Winter	84.267	0.0	33		
60 min Winter	54.074	0.0	62		
120 min Winter	33.506	0.0	120		
180 min Winter	24.949	0.0	176		
240 min Winter	20.093	0.0	232		
360 min Winter	14.773	0.0	338		
480 min Winter	11.871	0.0	384		
600 min Winter	10.010	0.0	458		
720 min Winter	8.703	0.0	536		
960 min Winter	6.973	0.0	684		
1440 min Winter	5.093	0.0	968		
2160 min Winter	3.711	0.0	1360		
2880 min Winter	2.961	0.0	1696		
4320 min Winter	2.150	0.0	2248		
5760 min Winter	1.711	0.0	2944		
7200 min Winter	1.432	0.0	3680		
8640 min Winter	1.240	0.0	4408		
10080 min Winter	1.098	0.0	5040		
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19 - 21 Silvermills Court Henderson Place Lane Edinburgh EH3 5DG	Havant Road, Emsworth SUDs Drainage Car Park 8																									
Date 01/03/2017 16:18 File Car Park 8.srcx	Designed by LK/AC Checked by AMF																									
Micro Drainage Source Control 2015.1																										
<u>Model Details</u> Storage is Online Cover Level (m) 0.450 <u>Porous Car Park Structure</u> <table> <tr> <td>Infiltration Coefficient Base (m/hr)</td> <td>0.01872</td> <td>Width (m)</td> <td>8.8</td> </tr> <tr> <td>Membrane Percolation (mm/hr)</td> <td>500</td> <td>Length (m)</td> <td>39.6</td> </tr> <tr> <td>Max Percolation (l/s)</td> <td>48.4</td> <td>Slope (1:X)</td> <td>10000.0</td> </tr> <tr> <td>Safety Factor</td> <td>2.0</td> <td>Depression Storage (mm)</td> <td>3</td> </tr> <tr> <td>Porosity</td> <td>0.30</td> <td>Evaporation (mm/day)</td> <td>1</td> </tr> <tr> <td>Invert Level (m)</td> <td>0.000</td> <td>Cap Volume Depth (m)</td> <td>0.350</td> </tr> </table>			Infiltration Coefficient Base (m/hr)	0.01872	Width (m)	8.8	Membrane Percolation (mm/hr)	500	Length (m)	39.6	Max Percolation (l/s)	48.4	Slope (1:X)	10000.0	Safety Factor	2.0	Depression Storage (mm)	3	Porosity	0.30	Evaporation (mm/day)	1	Invert Level (m)	0.000	Cap Volume Depth (m)	0.350
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Event: 240 min Winter



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Summer</td><td>0.282</td><td>0.282</td><td>1.5</td><td>28.2</td><td>Flood Risk</td></tr><tr><td>600 min Summer</td><td>0.267</td><td>0.267</td><td>1.5</td><td>26.8</td><td>Flood Risk</td></tr><tr><td>720 min Summer</td><td>0.252</td><td>0.252</td><td>1.5</td><td>25.3</td><td>Flood Risk</td></tr><tr><td>960 min Summer</td><td>0.223</td><td>0.223</td><td>1.5</td><td>22.3</td><td>Flood Risk</td></tr><tr><td>1440 min Summer</td><td>0.170</td><td>0.170</td><td>1.5</td><td>16.9</td><td>O K</td></tr><tr><td>2160 min Summer</td><td>0.108</td><td>0.108</td><td>1.5</td><td>10.7</td><td>O K</td></tr><tr><td>2880 min Summer</td><td>0.069</td><td>0.069</td><td>1.5</td><td>6.7</td><td>O K</td></tr><tr><td>4320 min Summer</td><td>0.044</td><td>0.044</td><td>1.4</td><td>4.2</td><td>O K</td></tr><tr><td>5760 min Summer</td><td>0.035</td><td>0.035</td><td>1.1</td><td>3.3</td><td>O K</td></tr><tr><td>7200 min Summer</td><td>0.030</td><td>0.030</td><td>0.9</td><td>2.8</td><td>O K</td></tr><tr><td>8640 min 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Summer	0.221	0.221	1.5	22.1	Flood Risk	60 min Summer	0.271	0.271	1.5	27.2	Flood Risk	120 min Summer	0.305	0.305	1.5	30.6	Flood Risk	180 min Summer	0.309	0.309	1.5	31.0	Flood Risk	240 min Summer	0.306	0.306	1.5	30.7	Flood Risk	360 min Summer	0.295	0.295	1.5	29.6	Flood Risk	480 min Summer	0.282	0.282	1.5	28.2	Flood Risk	600 min Summer	0.267	0.267	1.5	26.8	Flood Risk	720 min Summer	0.252	0.252	1.5	25.3	Flood Risk	960 min Summer	0.223	0.223	1.5	22.3	Flood Risk	1440 min Summer	0.170	0.170	1.5	16.9	O K	2160 min Summer	0.108	0.108	1.5	10.7	O K	2880 min Summer	0.069	0.069	1.5	6.7	O K	4320 min Summer	0.044	0.044	1.4	4.2	O K	5760 min Summer	0.035	0.035	1.1	3.3	O K	7200 min Summer	0.030	0.030	0.9	2.8	O K	8640 min Summer	0.026	0.026	0.8	2.4	O K	10080 min Summer	0.023	0.023	0.7	2.1	O K	15 min Winter	0.189	0.189	1.5	18.9	O K	Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)	15 min Summer	125.353	0.0	18	30 min Summer	84.267	0.0	33	60 min Summer	54.074	0.0	62	120 min Summer	33.506	0.0	120	180 min Summer	24.949	0.0	162	240 min Summer	20.093	0.0	192	360 min Summer	14.773	0.0	256	480 min Summer	11.871	0.0	326	600 min Summer	10.010	0.0	392	720 min Summer	8.703	0.0	462	960 min Summer	6.973	0.0	596	1440 min Summer	5.093	0.0	850	2160 min Summer	3.711	0.0	1192	2880 min Summer	2.961	0.0	1528	4320 min Summer	2.150	0.0	2204	5760 min Summer	1.711	0.0	2936	7200 min Summer	1.432	0.0	3672	8640 min Summer	1.240	0.0	4408	10080 min Summer	1.098	0.0	5136	15 min Winter	125.353	0.0	18
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Cundall, Johnston & Partners				Page 2	
19 - 21 Silvermills Court		Havant Road, Emsworth			
Henderson Place Lane		SUDs Drainage			
Edinburgh EH3 5DG		Car Park 9			
Date 01/03/2017 16:06		Designed by LK/AC			
File Car Park 9.srcx		Checked by AMF			
Micro Drainage		Source Control 2015.1			
<u>Summary of Results for 100 year Return Period (+40%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	0.251	0.251	1.5	25.1	Flood Risk
60 min Winter	0.309	0.309	1.5	31.0	Flood Risk
120 min Winter	0.352	0.352	1.5	35.3	Flood Risk
180 min Winter	0.361	0.361	1.5	36.2	Flood Risk
240 min Winter	0.356	0.356	1.5	35.7	Flood Risk
360 min Winter	0.340	0.340	1.5	34.1	Flood Risk
480 min Winter	0.320	0.320	1.5	32.1	Flood Risk
600 min Winter	0.298	0.298	1.5	29.9	Flood Risk
720 min Winter	0.275	0.275	1.5	27.5	Flood Risk
960 min Winter	0.229	0.229	1.5	22.9	Flood Risk
1440 min Winter	0.148	0.148	1.5	14.7	O K
2160 min Winter	0.065	0.065	1.5	6.3	O K
2880 min Winter	0.044	0.044	1.4	4.2	O K
4320 min Winter	0.032	0.032	1.0	3.0	O K
5760 min Winter	0.026	0.026	0.8	2.4	O K
7200 min Winter	0.022	0.022	0.7	1.9	O K
8640 min Winter	0.019	0.019	0.6	1.6	O K
10080 min Winter	0.017	0.017	0.5	1.4	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)		
30 min Winter	84.267	0.0	32		
60 min Winter	54.074	0.0	60		
120 min Winter	33.506	0.0	118		
180 min Winter	24.949	0.0	174		
240 min Winter	20.093	0.0	224		
360 min Winter	14.773	0.0	278		
480 min Winter	11.871	0.0	354		
600 min Winter	10.010	0.0	430		
720 min Winter	8.703	0.0	502		
960 min Winter	6.973	0.0	642		
1440 min Winter	5.093	0.0	894		
2160 min Winter	3.711	0.0	1208		
2880 min Winter	2.961	0.0	1496		
4320 min Winter	2.150	0.0	2208		
5760 min Winter	1.711	0.0	2944		
7200 min Winter	1.432	0.0	3592		
8640 min Winter	1.240	0.0	4400		
10080 min Winter	1.098	0.0	5008		
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19 - 21 Silvermills Court Henderson Place Lane Edinburgh EH3 5DG	Havant Road, Emsworth SUDs Drainage Car Park 9	
Date 01/03/2017 16:06 File Car Park 9.srcx	Designed by LK/AC Checked by AMF	
Micro Drainage Source Control 2015.1		

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.100	Shortest Storm (mins)	15
Ratio R	0.350	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

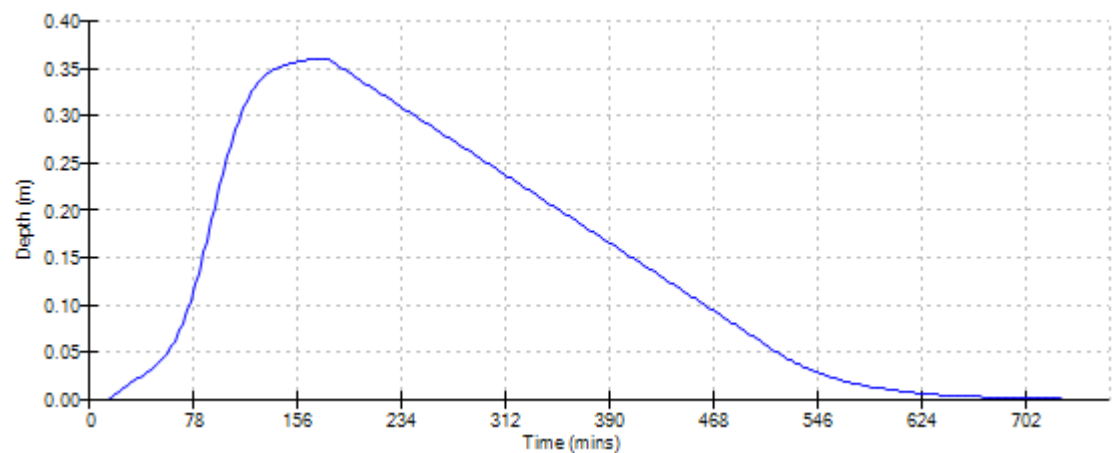
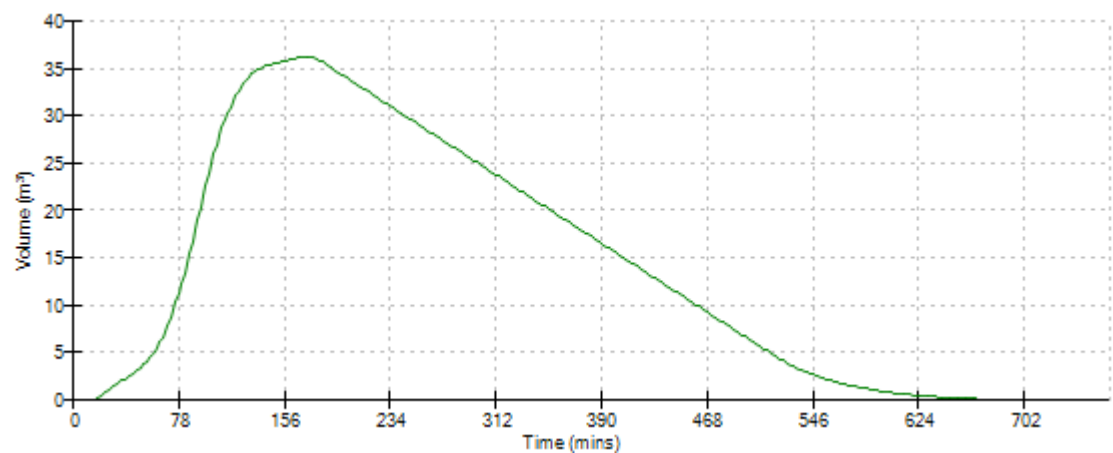
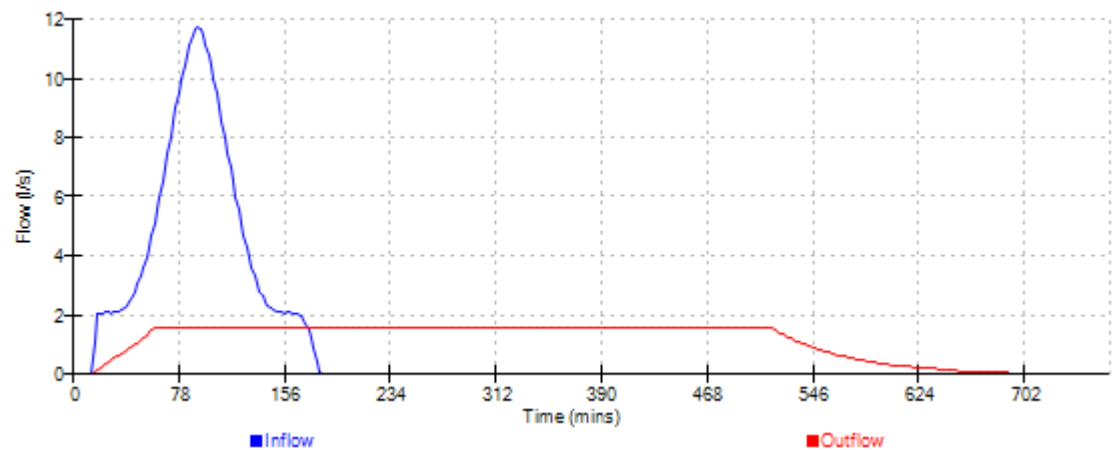
Total Area (ha) 0.080

Time (mins)	Area	Time (mins)	Area
From: To:	(ha)	From: To:	(ha)
0 2	0.040	2 4	0.040

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19 - 21 Silvermills Court Henderson Place Lane Edinburgh EH3 5DG	Havant Road, Emsworth SUDs Drainage Car Park 9																									
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<u>Model Details</u> Storage is Online Cover Level (m) 0.500 <u>Porous Car Park Structure</u> <table> <tr> <td>Infiltration Coefficient Base (m/hr)</td> <td>0.03312</td> <td>Width (m)</td> <td>7.4</td> </tr> <tr> <td>Membrane Percolation (mm/hr)</td> <td>500</td> <td>Length (m)</td> <td>45.5</td> </tr> <tr> <td>Max Percolation (l/s)</td> <td>46.8</td> <td>Slope (1:X)</td> <td>10000.0</td> </tr> <tr> <td>Safety Factor</td> <td>2.0</td> <td>Depression Storage (mm)</td> <td>3</td> </tr> <tr> <td>Porosity</td> <td>0.30</td> <td>Evaporation (mm/day)</td> <td>1</td> </tr> <tr> <td>Invert Level (m)</td> <td>0.000</td> <td>Cap Volume Depth (m)</td> <td>0.400</td> </tr> </table>			Infiltration Coefficient Base (m/hr)	0.03312	Width (m)	7.4	Membrane Percolation (mm/hr)	500	Length (m)	45.5	Max Percolation (l/s)	46.8	Slope (1:X)	10000.0	Safety Factor	2.0	Depression Storage (mm)	3	Porosity	0.30	Evaporation (mm/day)	1	Invert Level (m)	0.000	Cap Volume Depth (m)	0.400
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Event: 180 min Winter

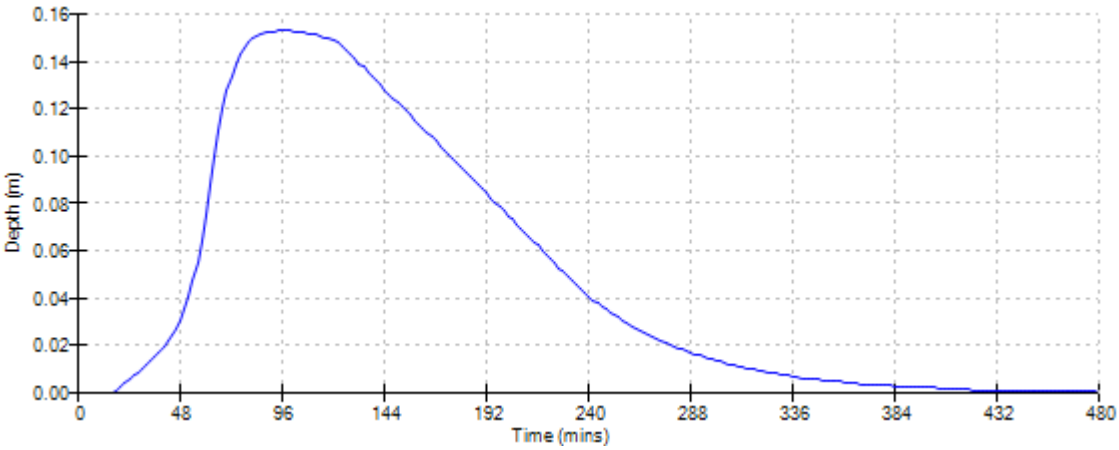
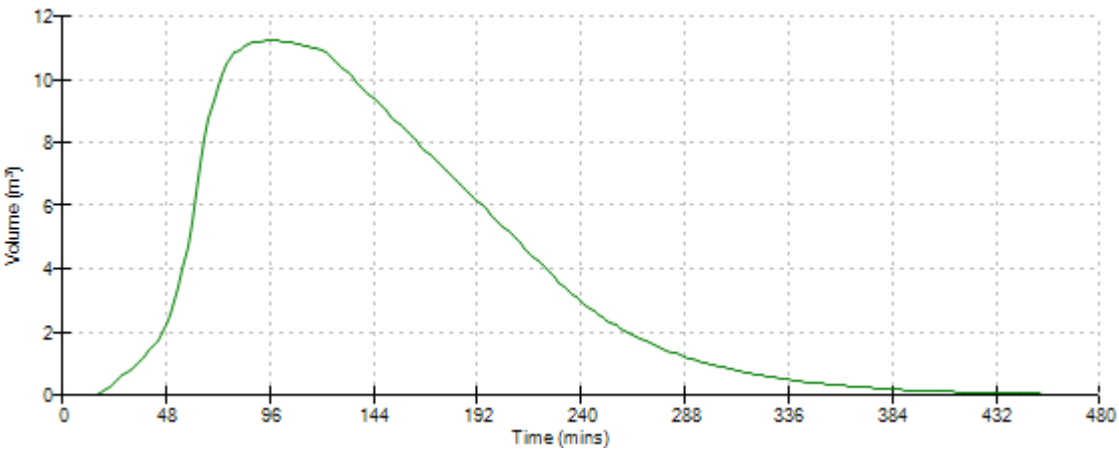
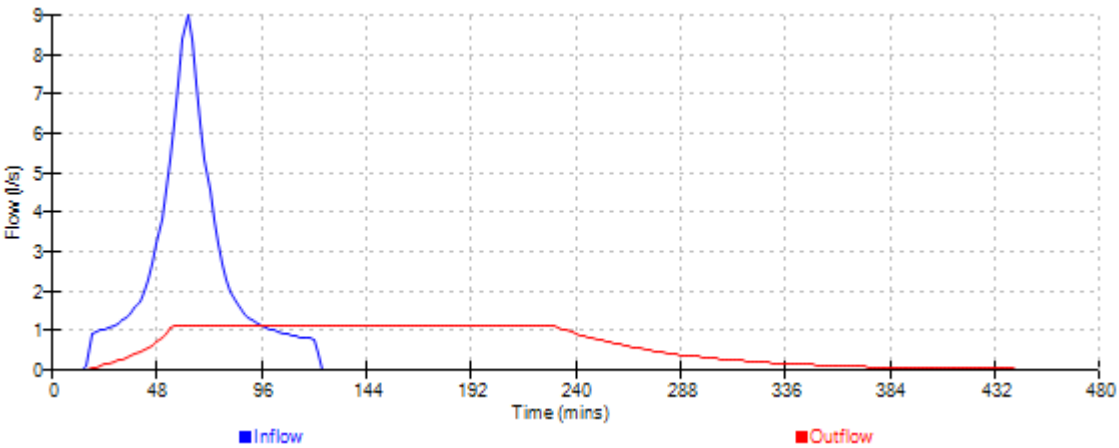


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Volume (m³)	Status	15 min Summer	0.090	0.090	1.1	6.6	O K	30 min Summer	0.119	0.119	1.1	8.7	Flood Risk	60 min Summer	0.142	0.142	1.1	10.4	Flood Risk	120 min Summer	0.153	0.153	1.1	11.2	Flood Risk	180 min Summer	0.154	0.154	1.1	11.2	Flood Risk	240 min Summer	0.150	0.150	1.1	10.9	Flood Risk	360 min Summer	0.138	0.138	1.1	10.1	Flood Risk	480 min Summer	0.125	0.125	1.1	9.2	Flood Risk	600 min Summer	0.113	0.113	1.1	8.3	Flood Risk	720 min Summer	0.101	0.101	1.1	7.4	Flood Risk	960 min Summer	0.081	0.081	1.1	5.9	O K	1440 min Summer	0.055	0.055	1.1	4.0	O K	2160 min Summer	0.041	0.041	0.9	3.0	O K	2880 min Summer	0.034	0.034	0.8	2.5	O K	4320 min Summer	0.026	0.026	0.6	1.8	O K	5760 min Summer	0.021	0.021	0.5	1.5	O K	7200 min Summer	0.017	0.017	0.4	1.2	O K	8640 min Summer	0.015	0.015	0.3	1.1	O K	10080 min Summer	0.013	0.013	0.3	0.9	O K	15 min Winter	0.103	0.103	1.1	7.5	Flood Risk	Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)	15 min Summer	125.353	0.0	18	30 min Summer	84.267	0.0	32	60 min Summer	54.074	0.0	60	120 min Summer	33.506	0.0	96	180 min Summer	24.949	0.0	130	240 min Summer	20.093	0.0	164	360 min Summer	14.773	0.0	232	480 min Summer	11.871	0.0	298	600 min Summer	10.010	0.0	362	720 min Summer	8.703	0.0	426	960 min Summer	6.973	0.0	542	1440 min Summer	5.093	0.0	766	2160 min Summer	3.711	0.0	1124	2880 min Summer	2.961	0.0	1472	4320 min Summer	2.150	0.0	2204	5760 min Summer	1.711	0.0	2936	7200 min Summer	1.432	0.0	3672	8640 min Summer	1.240	0.0	4384	10080 min Summer	1.098	0.0	5136	15 min Winter	125.353	0.0	18
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Cundall, Johnston & Partners				Page 2	
19 - 21 Silvermills Court		Havant Road, Emsworth			
Henderson Place Lane		SUDs Drainage			
Edinburgh EH3 5DG		Car Park 10			
Date 28/02/2017 19:51		Designed by LK/AC			
File CAR PARK 10.SRCX		Checked by AMF			
Micro Drainage		Source Control 2015.1			
<u>Summary of Results for 100 year Return Period (+40%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	0.136	0.136	1.1	9.9	Flood Risk
60 min Winter	0.163	0.163	1.1	12.0	Flood Risk
120 min Winter	0.176	0.176	1.1	12.9	Flood Risk
180 min Winter	0.175	0.175	1.1	12.8	Flood Risk
240 min Winter	0.168	0.168	1.1	12.3	Flood Risk
360 min Winter	0.149	0.149	1.1	10.9	Flood Risk
480 min Winter	0.129	0.129	1.1	9.5	Flood Risk
600 min Winter	0.110	0.110	1.1	8.0	Flood Risk
720 min Winter	0.092	0.092	1.1	6.7	O K
960 min Winter	0.064	0.064	1.1	4.7	O K
1440 min Winter	0.043	0.043	1.0	3.1	O K
2160 min Winter	0.032	0.032	0.7	2.3	O K
2880 min Winter	0.026	0.026	0.6	1.9	O K
4320 min Winter	0.019	0.019	0.4	1.4	O K
5760 min Winter	0.015	0.015	0.3	1.1	O K
7200 min Winter	0.013	0.013	0.3	0.9	O K
8640 min Winter	0.011	0.011	0.3	0.8	O K
10080 min Winter	0.010	0.010	0.2	0.7	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)		
30 min Winter	84.267	0.0	32		
60 min Winter	54.074	0.0	60		
120 min Winter	33.506	0.0	112		
180 min Winter	24.949	0.0	140		
240 min Winter	20.093	0.0	178		
360 min Winter	14.773	0.0	252		
480 min Winter	11.871	0.0	322		
600 min Winter	10.010	0.0	386		
720 min Winter	8.703	0.0	448		
960 min Winter	6.973	0.0	558		
1440 min Winter	5.093	0.0	766		
2160 min Winter	3.711	0.0	1124		
2880 min Winter	2.961	0.0	1500		
4320 min Winter	2.150	0.0	2244		
5760 min Winter	1.711	0.0	2888		
7200 min Winter	1.432	0.0	3624		
8640 min Winter	1.240	0.0	4488		
10080 min Winter	1.098	0.0	5080		
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19 - 21 Silvermills Court Henderson Place Lane Edinburgh EH3 5DG	Havant Road, Emsworth SUDs Drainage Car Park 10																									
Date 28/02/2017 19:51 File CAR PARK 10.SRCX	Designed by LK/AC Checked by AMF																									
Micro Drainage Source Control 2015.1																										
<u>Model Details</u> Storage is Online Cover Level (m) 0.400 <u>Porous Car Park Structure</u> <table> <tr> <td>Infiltration Coefficient Base (m/hr)</td> <td>0.03312</td> <td>Width (m)</td> <td>27.5</td> </tr> <tr> <td>Membrane Percolation (mm/hr)</td> <td>500</td> <td>Length (m)</td> <td>8.9</td> </tr> <tr> <td>Max Percolation (l/s)</td> <td>34.0</td> <td>Slope (1:X)</td> <td>10000.0</td> </tr> <tr> <td>Safety Factor</td> <td>2.0</td> <td>Depression Storage (mm)</td> <td>3</td> </tr> <tr> <td>Porosity</td> <td>0.30</td> <td>Evaporation (mm/day)</td> <td>1</td> </tr> <tr> <td>Invert Level (m)</td> <td>0.000</td> <td>Cap Volume Depth (m)</td> <td>0.300</td> </tr> </table>			Infiltration Coefficient Base (m/hr)	0.03312	Width (m)	27.5	Membrane Percolation (mm/hr)	500	Length (m)	8.9	Max Percolation (l/s)	34.0	Slope (1:X)	10000.0	Safety Factor	2.0	Depression Storage (mm)	3	Porosity	0.30	Evaporation (mm/day)	1	Invert Level (m)	0.000	Cap Volume Depth (m)	0.300
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Event: 120 min Summer



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<u>Summary of Results for 100 year Return Period (+40%)</u> Half Drain Time : 390 minutes. <table><thead><tr><th>Storm Event</th><th>Max Level (m)</th><th>Max Depth (m)</th><th>Max Infiltration (l/s)</th><th>Max Volume (m³)</th><th>Status</th></tr></thead><tbody><tr><td>15 min Summer</td><td>0.154</td><td>0.154</td><td>0.3</td><td>6.4</td><td>O K</td></tr><tr><td>30 min Summer</td><td>0.207</td><td>0.207</td><td>0.3</td><td>8.6</td><td>Flood Risk</td></tr><tr><td>60 min Summer</td><td>0.260</td><td>0.260</td><td>0.3</td><td>10.8</td><td>Flood Risk</td></tr><tr><td>120 min Summer</td><td>0.307</td><td>0.307</td><td>0.3</td><td>12.7</td><td>Flood Risk</td></tr><tr><td>180 min Summer</td><td>0.325</td><td>0.325</td><td>0.3</td><td>13.5</td><td>Flood Risk</td></tr><tr><td>240 min Summer</td><td>0.332</td><td>0.332</td><td>0.3</td><td>13.8</td><td>Flood Risk</td></tr><tr><td>360 min Summer</td><td>0.331</td><td>0.331</td><td>0.3</td><td>13.7</td><td>Flood Risk</td></tr><tr><td>480 min Summer</td><td>0.326</td><td>0.326</td><td>0.3</td><td>13.5</td><td>Flood Risk</td></tr><tr><td>600 min Summer</td><td>0.320</td><td>0.320</td><td>0.3</td><td>13.3</td><td>Flood Risk</td></tr><tr><td>720 min Summer</td><td>0.313</td><td>0.313</td><td>0.3</td><td>13.0</td><td>Flood Risk</td></tr><tr><td>960 min Summer</td><td>0.296</td><td>0.296</td><td>0.3</td><td>12.3</td><td>Flood Risk</td></tr><tr><td>1440 min Summer</td><td>0.263</td><td>0.263</td><td>0.3</td><td>10.9</td><td>Flood Risk</td></tr><tr><td>2160 min Summer</td><td>0.214</td><td>0.214</td><td>0.3</td><td>8.9</td><td>Flood Risk</td></tr><tr><td>2880 min Summer</td><td>0.171</td><td>0.171</td><td>0.3</td><td>7.1</td><td>O K</td></tr><tr><td>4320 min Summer</td><td>0.105</td><td>0.105</td><td>0.3</td><td>4.3</td><td>O K</td></tr><tr><td>5760 min Summer</td><td>0.064</td><td>0.064</td><td>0.3</td><td>2.7</td><td>O K</td></tr><tr><td>7200 min Summer</td><td>0.049</td><td>0.049</td><td>0.3</td><td>2.0</td><td>O K</td></tr><tr><td>8640 min Summer</td><td>0.042</td><td>0.042</td><td>0.3</td><td>1.8</td><td>O K</td></tr><tr><td>10080 min Summer</td><td>0.038</td><td>0.038</td><td>0.3</td><td>1.6</td><td>O K</td></tr><tr><td>15 min Winter</td><td>0.174</td><td>0.174</td><td>0.3</td><td>7.2</td><td>O K</td></tr></tbody></table> <table><thead><tr><th>Storm Event</th><th>Rain (mm/hr)</th><th>Flooded Volume (m³)</th><th>Time-Peak (mins)</th></tr></thead><tbody><tr><td>15 min Summer</td><td>125.353</td><td>0.0</td><td>18</td></tr><tr><td>30 min Summer</td><td>84.267</td><td>0.0</td><td>33</td></tr><tr><td>60 min Summer</td><td>54.074</td><td>0.0</td><td>62</td></tr><tr><td>120 min Summer</td><td>33.506</td><td>0.0</td><td>122</td></tr><tr><td>180 min Summer</td><td>24.949</td><td>0.0</td><td>182</td></tr><tr><td>240 min Summer</td><td>20.093</td><td>0.0</td><td>240</td></tr><tr><td>360 min Summer</td><td>14.773</td><td>0.0</td><td>322</td></tr><tr><td>480 min Summer</td><td>11.871</td><td>0.0</td><td>382</td></tr><tr><td>600 min Summer</td><td>10.010</td><td>0.0</td><td>444</td></tr><tr><td>720 min Summer</td><td>8.703</td><td>0.0</td><td>510</td></tr><tr><td>960 min Summer</td><td>6.973</td><td>0.0</td><td>646</td></tr><tr><td>1440 min Summer</td><td>5.093</td><td>0.0</td><td>922</td></tr><tr><td>2160 min Summer</td><td>3.711</td><td>0.0</td><td>1316</td></tr><tr><td>2880 min Summer</td><td>2.961</td><td>0.0</td><td>1676</td></tr><tr><td>4320 min Summer</td><td>2.150</td><td>0.0</td><td>2380</td></tr><tr><td>5760 min Summer</td><td>1.711</td><td>0.0</td><td>3048</td></tr><tr><td>7200 min Summer</td><td>1.432</td><td>0.0</td><td>3672</td></tr><tr><td>8640 min Summer</td><td>1.240</td><td>0.0</td><td>4408</td></tr><tr><td>10080 min Summer</td><td>1.098</td><td>0.0</td><td>5144</td></tr><tr><td>15 min Winter</td><td>125.353</td><td>0.0</td><td>18</td></tr></tbody></table>						Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status	15 min Summer	0.154	0.154	0.3	6.4	O K	30 min Summer	0.207	0.207	0.3	8.6	Flood Risk	60 min Summer	0.260	0.260	0.3	10.8	Flood Risk	120 min Summer	0.307	0.307	0.3	12.7	Flood Risk	180 min Summer	0.325	0.325	0.3	13.5	Flood Risk	240 min Summer	0.332	0.332	0.3	13.8	Flood Risk	360 min Summer	0.331	0.331	0.3	13.7	Flood Risk	480 min Summer	0.326	0.326	0.3	13.5	Flood Risk	600 min Summer	0.320	0.320	0.3	13.3	Flood Risk	720 min Summer	0.313	0.313	0.3	13.0	Flood Risk	960 min Summer	0.296	0.296	0.3	12.3	Flood Risk	1440 min Summer	0.263	0.263	0.3	10.9	Flood Risk	2160 min Summer	0.214	0.214	0.3	8.9	Flood Risk	2880 min Summer	0.171	0.171	0.3	7.1	O K	4320 min Summer	0.105	0.105	0.3	4.3	O K	5760 min Summer	0.064	0.064	0.3	2.7	O K	7200 min Summer	0.049	0.049	0.3	2.0	O K	8640 min Summer	0.042	0.042	0.3	1.8	O K	10080 min Summer	0.038	0.038	0.3	1.6	O K	15 min Winter	0.174	0.174	0.3	7.2	O K	Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)	15 min Summer	125.353	0.0	18	30 min Summer	84.267	0.0	33	60 min Summer	54.074	0.0	62	120 min Summer	33.506	0.0	122	180 min Summer	24.949	0.0	182	240 min Summer	20.093	0.0	240	360 min Summer	14.773	0.0	322	480 min Summer	11.871	0.0	382	600 min Summer	10.010	0.0	444	720 min Summer	8.703	0.0	510	960 min Summer	6.973	0.0	646	1440 min Summer	5.093	0.0	922	2160 min Summer	3.711	0.0	1316	2880 min Summer	2.961	0.0	1676	4320 min Summer	2.150	0.0	2380	5760 min Summer	1.711	0.0	3048	7200 min Summer	1.432	0.0	3672	8640 min Summer	1.240	0.0	4408	10080 min Summer	1.098	0.0	5144	15 min Winter	125.353	0.0	18
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Cundall, Johnston & Partners					Page 2
19 - 21 Silvermills Court		Havant Road, Emsworth			
Henderson Place Lane		SUDs Drainage			
Edinburgh EH3 5DG		Car Park 11			
Date 01/03/2017 11:28		Designed by LK/AC			
File Car Park 11.srcx		Checked by AMF			
Micro Drainage		Source Control 2015.1			
<u>Summary of Results for 100 year Return Period (+40%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	0.234	0.234	0.3	9.7	Flood Risk
60 min Winter	0.295	0.295	0.3	12.2	Flood Risk
120 min Winter	0.350	0.350	0.3	14.5	Flood Risk
180 min Winter	0.373	0.373	0.3	15.5	Flood Risk
240 min Winter	0.383	0.383	0.3	15.9	Flood Risk
360 min Winter	0.386	0.386	0.3	16.0	Flood Risk
480 min Winter	0.379	0.379	0.3	15.7	Flood Risk
600 min Winter	0.370	0.370	0.3	15.4	Flood Risk
720 min Winter	0.360	0.360	0.3	15.0	Flood Risk
960 min Winter	0.337	0.337	0.3	14.0	Flood Risk
1440 min Winter	0.285	0.285	0.3	11.8	Flood Risk
2160 min Winter	0.210	0.210	0.3	8.7	Flood Risk
2880 min Winter	0.145	0.145	0.3	6.0	O K
4320 min Winter	0.059	0.059	0.3	2.5	O K
5760 min Winter	0.043	0.043	0.3	1.8	O K
7200 min Winter	0.036	0.036	0.3	1.5	O K
8640 min Winter	0.031	0.031	0.2	1.3	O K
10080 min Winter	0.028	0.028	0.2	1.1	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)		
30 min Winter	84.267	0.0	33		
60 min Winter	54.074	0.0	62		
120 min Winter	33.506	0.0	120		
180 min Winter	24.949	0.0	178		
240 min Winter	20.093	0.0	234		
360 min Winter	14.773	0.0	344		
480 min Winter	11.871	0.0	444		
600 min Winter	10.010	0.0	476		
720 min Winter	8.703	0.0	552		
960 min Winter	6.973	0.0	704		
1440 min Winter	5.093	0.0	996		
2160 min Winter	3.711	0.0	1404		
2880 min Winter	2.961	0.0	1784		
4320 min Winter	2.150	0.0	2376		
5760 min Winter	1.711	0.0	2992		
7200 min Winter	1.432	0.0	3672		
8640 min Winter	1.240	0.0	4408		
10080 min Winter	1.098	0.0	5136		
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19 - 21 Silvermills Court Henderson Place Lane Edinburgh EH3 5DG	Havant Road, Emsworth SUDs Drainage Car Park 11	
Date 01/03/2017 11:28 File Car Park 11.srcx	Designed by LK/AC Checked by AMF	
Micro Drainage Source Control 2015.1		

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.100	Shortest Storm (mins)	15
Ratio R	0.350	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

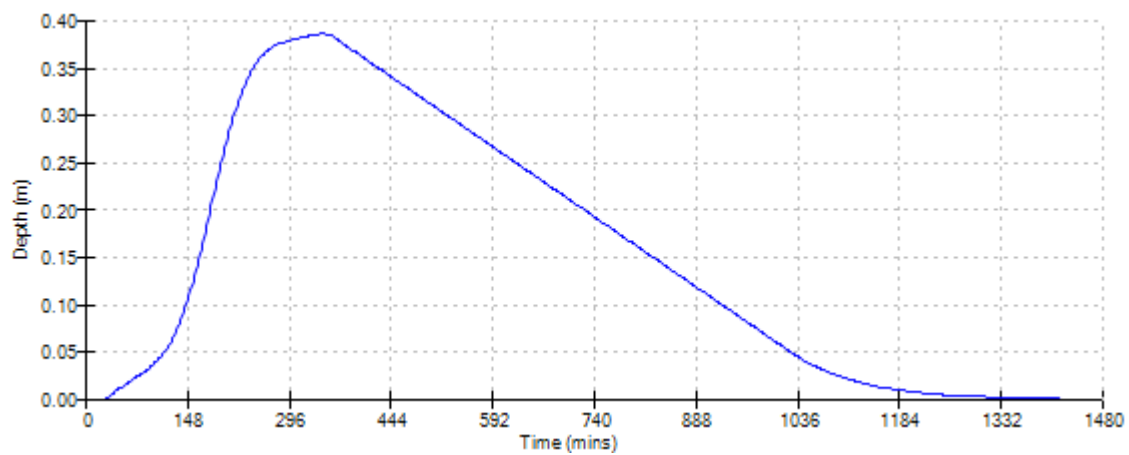
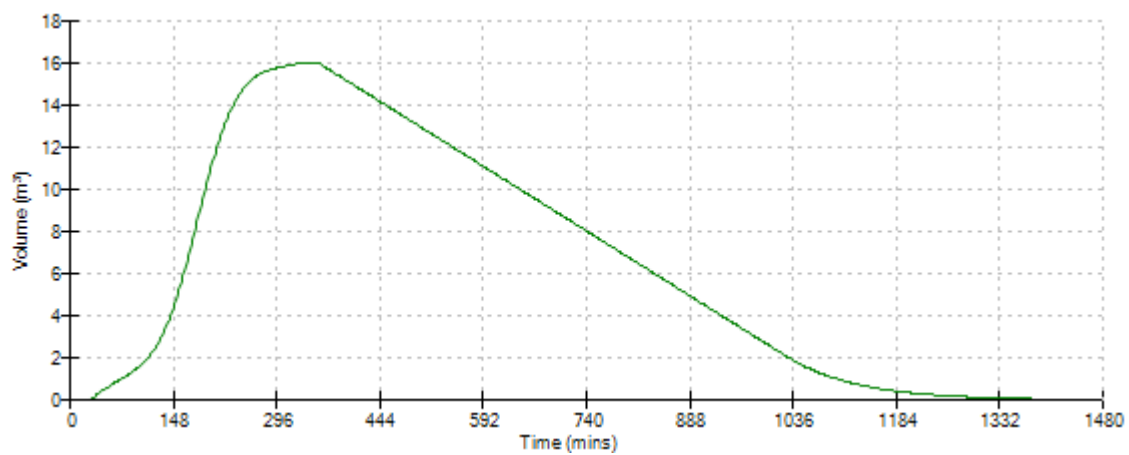
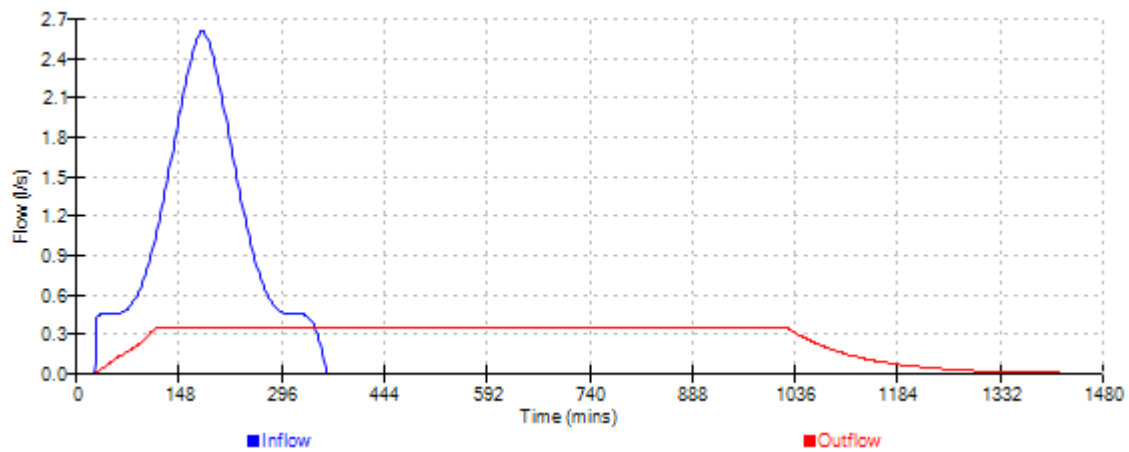
Total Area (ha) 0.030

Time (mins)	Area	Time (mins)	Area
From: To:	(ha)	From: To:	(ha)
0 2	0.015	2 4	0.015

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19 - 21 Silvermills Court Henderson Place Lane Edinburgh EH3 5DG	Havant Road, Emsworth SUDs Drainage Car Park 11																									
Date 01/03/2017 11:28 File Car Park 11.srcx	Designed by LK/AC Checked by AMF																									
Micro Drainage Source Control 2015.1																										
<u>Model Details</u> Storage is Online Cover Level (m) 0.500 <u>Porous Car Park Structure</u> <table> <tr> <td>Infiltration Coefficient Base (m/hr)</td> <td>0.01800</td> <td>Width (m)</td> <td>19.8</td> </tr> <tr> <td>Membrane Percolation (mm/hr)</td> <td>500</td> <td>Length (m)</td> <td>7.0</td> </tr> <tr> <td>Max Percolation (l/s)</td> <td>19.3</td> <td>Slope (1:X)</td> <td>10000.0</td> </tr> <tr> <td>Safety Factor</td> <td>2.0</td> <td>Depression Storage (mm)</td> <td>3</td> </tr> <tr> <td>Porosity</td> <td>0.30</td> <td>Evaporation (mm/day)</td> <td>1</td> </tr> <tr> <td>Invert Level (m)</td> <td>0.000</td> <td>Cap Volume Depth (m)</td> <td>0.400</td> </tr> </table>			Infiltration Coefficient Base (m/hr)	0.01800	Width (m)	19.8	Membrane Percolation (mm/hr)	500	Length (m)	7.0	Max Percolation (l/s)	19.3	Slope (1:X)	10000.0	Safety Factor	2.0	Depression Storage (mm)	3	Porosity	0.30	Evaporation (mm/day)	1	Invert Level (m)	0.000	Cap Volume Depth (m)	0.400
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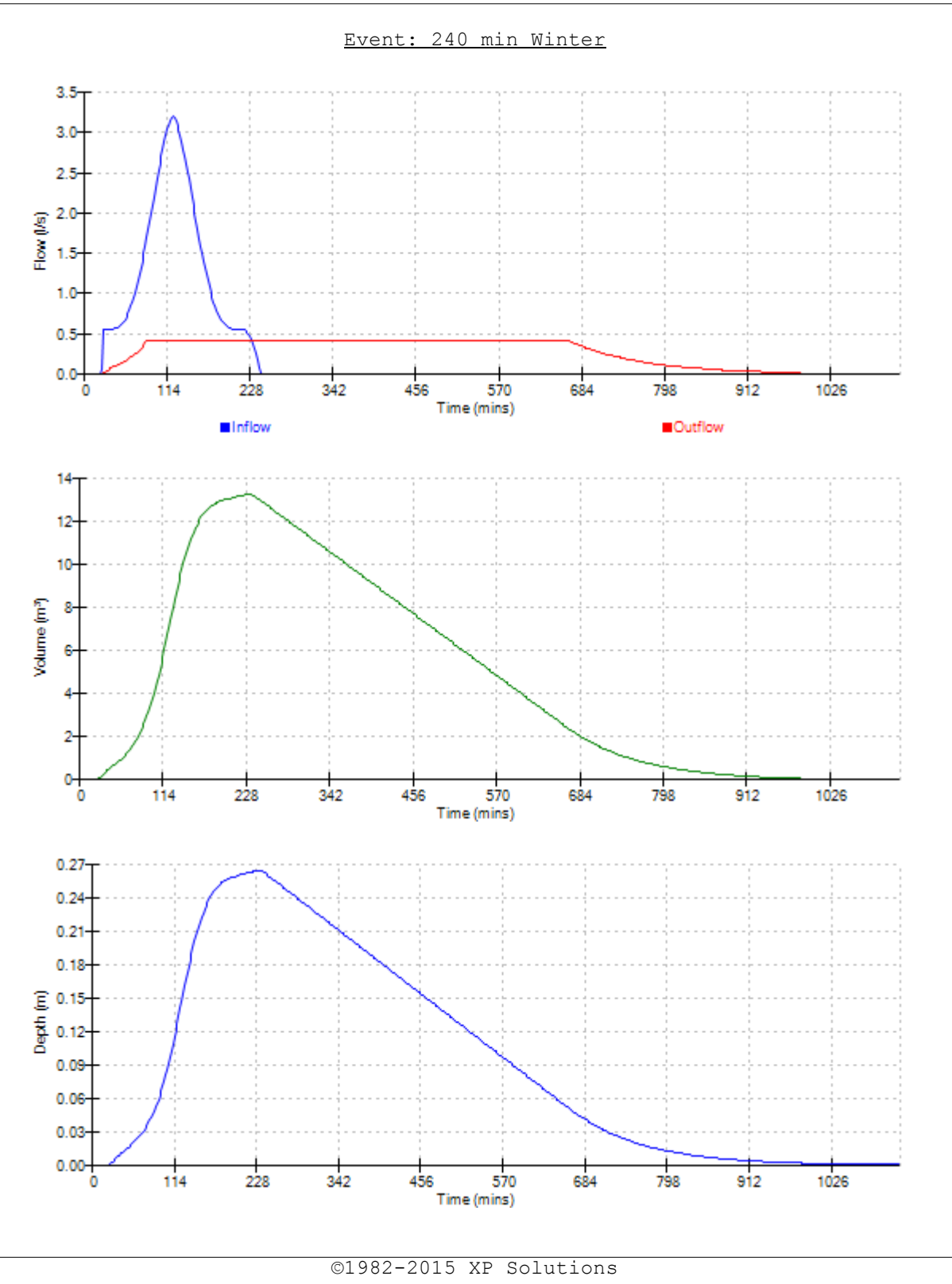
Event: 360 min Winter



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19 - 21 Silvermills Court		Havant Road, Emsworth			
Henderson Place Lane		SUDs Drainage			
Edinburgh EH3 5DG		Car Park 12			
Date 01/03/2017 12:24		Designed by LK/AC			
File CAR PARK 12.SRCX		Checked by AMF			
Micro Drainage		Source Control 2015.1			
<u>Summary of Results for 100 year Return Period (+40%)</u> Half Drain Time : 272 minutes.					
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	0.112	0.112	0.4	5.6	Flood Risk
30 min Summer	0.150	0.150	0.4	7.5	Flood Risk
60 min Summer	0.187	0.187	0.4	9.4	Flood Risk
120 min Summer	0.217	0.217	0.4	10.9	Flood Risk
180 min Summer	0.227	0.227	0.4	11.3	Flood Risk
240 min Summer	0.227	0.227	0.4	11.4	Flood Risk
360 min Summer	0.225	0.225	0.4	11.3	Flood Risk
480 min Summer	0.220	0.220	0.4	11.0	Flood Risk
600 min Summer	0.213	0.213	0.4	10.7	Flood Risk
720 min Summer	0.206	0.206	0.4	10.3	Flood Risk
960 min Summer	0.190	0.190	0.4	9.5	Flood Risk
1440 min Summer	0.159	0.159	0.4	7.9	Flood Risk
2160 min Summer	0.118	0.118	0.4	5.9	Flood Risk
2880 min Summer	0.087	0.087	0.4	4.3	O K
4320 min Summer	0.052	0.052	0.4	2.5	O K
5760 min Summer	0.042	0.042	0.4	2.1	O K
7200 min Summer	0.036	0.036	0.3	1.7	O K
8640 min Summer	0.031	0.031	0.3	1.5	O K
10080 min Summer	0.028	0.028	0.2	1.3	O K
15 min Winter	0.127	0.127	0.4	6.3	Flood Risk
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)		
15 min Summer	125.353	0.0	18		
30 min Summer	84.267	0.0	33		
60 min Summer	54.074	0.0	62		
120 min Summer	33.506	0.0	122		
180 min Summer	24.949	0.0	180		
240 min Summer	20.093	0.0	216		
360 min Summer	14.773	0.0	278		
480 min Summer	11.871	0.0	342		
600 min Summer	10.010	0.0	410		
720 min Summer	8.703	0.0	478		
960 min Summer	6.973	0.0	616		
1440 min Summer	5.093	0.0	880		
2160 min Summer	3.711	0.0	1252		
2880 min Summer	2.961	0.0	1588		
4320 min Summer	2.150	0.0	2248		
5760 min Summer	1.711	0.0	2944		
7200 min Summer	1.432	0.0	3672		
8640 min Summer	1.240	0.0	4408		
10080 min Summer	1.098	0.0	5136		
15 min Winter	125.353	0.0	18		
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19 - 21 Silvermills Court Henderson Place Lane Edinburgh EH3 5DG		Havant Road, Emsworth SUDs Drainage Car Park 12			
Date 01/03/2017 12:24 File CAR PARK 12.SRCX		Designed by LK/AC Checked by AMF			
Micro Drainage		Source Control 2015.1			
<u>Summary of Results for 100 year Return Period (+40%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	0.170	0.170	0.4	8.5	Flood Risk
60 min Winter	0.213	0.213	0.4	10.7	Flood Risk
120 min Winter	0.249	0.249	0.4	12.5	Flood Risk
180 min Winter	0.261	0.261	0.4	13.1	Flood Risk
240 min Winter	0.264	0.264	0.4	13.2	Flood Risk
360 min Winter	0.258	0.258	0.4	13.0	Flood Risk
480 min Winter	0.251	0.251	0.4	12.6	Flood Risk
600 min Winter	0.242	0.242	0.4	12.1	Flood Risk
720 min Winter	0.230	0.230	0.4	11.5	Flood Risk
960 min Winter	0.206	0.206	0.4	10.3	Flood Risk
1440 min Winter	0.158	0.158	0.4	7.9	Flood Risk
2160 min Winter	0.098	0.098	0.4	4.9	O K
2880 min Winter	0.058	0.058	0.4	2.8	O K
4320 min Winter	0.040	0.040	0.3	1.9	O K
5760 min Winter	0.032	0.032	0.3	1.5	O K
7200 min Winter	0.027	0.027	0.2	1.3	O K
8640 min Winter	0.023	0.023	0.2	1.1	O K
10080 min Winter	0.021	0.021	0.2	1.0	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)		
30 min Winter	84.267	0.0	32		
60 min Winter	54.074	0.0	62		
120 min Winter	33.506	0.0	118		
180 min Winter	24.949	0.0	176		
240 min Winter	20.093	0.0	230		
360 min Winter	14.773	0.0	298		
480 min Winter	11.871	0.0	370		
600 min Winter	10.010	0.0	446		
720 min Winter	8.703	0.0	522		
960 min Winter	6.973	0.0	666		
1440 min Winter	5.093	0.0	938		
2160 min Winter	3.711	0.0	1300		
2880 min Winter	2.961	0.0	1588		
4320 min Winter	2.150	0.0	2248		
5760 min Winter	1.711	0.0	2992		
7200 min Winter	1.432	0.0	3680		
8640 min Winter	1.240	0.0	4408		
10080 min Winter	1.098	0.0	5136		
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19 - 21 Silvermills Court Henderson Place Lane Edinburgh EH3 5DG	Havant Road, Emsworth SUDs Drainage Car Park 12																									
Date 01/03/2017 12:24 File CAR PARK 12.SRCX	Designed by LK/AC Checked by AMF																									
Micro Drainage Source Control 2015.1																										
<u>Model Details</u> Storage is Online Cover Level (m) 0.400 <u>Porous Car Park Structure</u> <table> <tr> <td>Infiltration Coefficient Base (m/hr)</td> <td>0.01800</td> <td>Width (m)</td> <td>6.2</td> </tr> <tr> <td>Membrane Percolation (mm/hr)</td> <td>500</td> <td>Length (m)</td> <td>27.1</td> </tr> <tr> <td>Max Percolation (l/s)</td> <td>23.3</td> <td>Slope (1:X)</td> <td>10000.0</td> </tr> <tr> <td>Safety Factor</td> <td>2.0</td> <td>Depression Storage (mm)</td> <td>3</td> </tr> <tr> <td>Porosity</td> <td>0.30</td> <td>Evaporation (mm/day)</td> <td>1</td> </tr> <tr> <td>Invert Level (m)</td> <td>0.000</td> <td>Cap Volume Depth (m)</td> <td>0.300</td> </tr> </table>			Infiltration Coefficient Base (m/hr)	0.01800	Width (m)	6.2	Membrane Percolation (mm/hr)	500	Length (m)	27.1	Max Percolation (l/s)	23.3	Slope (1:X)	10000.0	Safety Factor	2.0	Depression Storage (mm)	3	Porosity	0.30	Evaporation (mm/day)	1	Invert Level (m)	0.000	Cap Volume Depth (m)	0.300
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<u>Summary of Results for 100 year Return Period (+40%)</u> Half Drain Time : 1444 minutes. <table><thead><tr><th>Storm Event</th><th>Max Level (m)</th><th>Max Depth (m)</th><th>Max Infiltration (l/s)</th><th>Max Volume (m³)</th><th>Status</th></tr></thead><tbody><tr><td>15 min Summer</td><td>0.121</td><td>0.121</td><td>0.1</td><td>5.8</td><td>O K</td></tr><tr><td>30 min Summer</td><td>0.164</td><td>0.164</td><td>0.1</td><td>7.9</td><td>O K</td></tr><tr><td>60 min Summer</td><td>0.211</td><td>0.211</td><td>0.1</td><td>10.2</td><td>Flood Risk</td></tr><tr><td>120 min Summer</td><td>0.259</td><td>0.259</td><td>0.1</td><td>12.5</td><td>Flood Risk</td></tr><tr><td>180 min Summer</td><td>0.285</td><td>0.285</td><td>0.1</td><td>13.7</td><td>Flood Risk</td></tr><tr><td>240 min Summer</td><td>0.301</td><td>0.301</td><td>0.1</td><td>14.5</td><td>Flood Risk</td></tr><tr><td>360 min Summer</td><td>0.322</td><td>0.322</td><td>0.1</td><td>15.5</td><td>Flood Risk</td></tr><tr><td>480 min Summer</td><td>0.335</td><td>0.335</td><td>0.1</td><td>16.2</td><td>Flood Risk</td></tr><tr><td>600 min Summer</td><td>0.343</td><td>0.343</td><td>0.1</td><td>16.5</td><td>Flood Risk</td></tr><tr><td>720 min Summer</td><td>0.347</td><td>0.347</td><td>0.1</td><td>16.8</td><td>Flood Risk</td></tr><tr><td>960 min Summer</td><td>0.350</td><td>0.350</td><td>0.1</td><td>16.9</td><td>Flood Risk</td></tr><tr><td>1440 min Summer</td><td>0.343</td><td>0.343</td><td>0.1</td><td>16.6</td><td>Flood Risk</td></tr><tr><td>2160 min Summer</td><td>0.330</td><td>0.330</td><td>0.1</td><td>15.9</td><td>Flood Risk</td></tr><tr><td>2880 min Summer</td><td>0.315</td><td>0.315</td><td>0.1</td><td>15.2</td><td>Flood Risk</td></tr><tr><td>4320 min Summer</td><td>0.283</td><td>0.283</td><td>0.1</td><td>13.7</td><td>Flood Risk</td></tr><tr><td>5760 min Summer</td><td>0.253</td><td>0.253</td><td>0.1</td><td>12.2</td><td>Flood Risk</td></tr><tr><td>7200 min Summer</td><td>0.224</td><td>0.224</td><td>0.1</td><td>10.8</td><td>Flood Risk</td></tr><tr><td>8640 min Summer</td><td>0.198</td><td>0.198</td><td>0.1</td><td>9.5</td><td>O K</td></tr><tr><td>10080 min Summer</td><td>0.173</td><td>0.173</td><td>0.1</td><td>8.3</td><td>O K</td></tr><tr><td>15 min Winter</td><td>0.136</td><td>0.136</td><td>0.1</td><td>6.5</td><td>O K</td></tr></tbody></table> <table><thead><tr><th>Storm Event</th><th>Rain (mm/hr)</th><th>Flooded Volume (m³)</th><th>Time-Peak (mins)</th></tr></thead><tbody><tr><td>15 min Summer</td><td>125.353</td><td>0.0</td><td>19</td></tr><tr><td>30 min Summer</td><td>84.267</td><td>0.0</td><td>34</td></tr><tr><td>60 min Summer</td><td>54.074</td><td>0.0</td><td>64</td></tr><tr><td>120 min Summer</td><td>33.506</td><td>0.0</td><td>124</td></tr><tr><td>180 min Summer</td><td>24.949</td><td>0.0</td><td>182</td></tr><tr><td>240 min Summer</td><td>20.093</td><td>0.0</td><td>242</td></tr><tr><td>360 min Summer</td><td>14.773</td><td>0.0</td><td>362</td></tr><tr><td>480 min Summer</td><td>11.871</td><td>0.0</td><td>482</td></tr><tr><td>600 min Summer</td><td>10.010</td><td>0.0</td><td>602</td></tr><tr><td>720 min Summer</td><td>8.703</td><td>0.0</td><td>722</td></tr><tr><td>960 min Summer</td><td>6.973</td><td>0.0</td><td>960</td></tr><tr><td>1440 min Summer</td><td>5.093</td><td>0.0</td><td>1228</td></tr><tr><td>2160 min Summer</td><td>3.711</td><td>0.0</td><td>1600</td></tr><tr><td>2880 min Summer</td><td>2.961</td><td>0.0</td><td>1992</td></tr><tr><td>4320 min Summer</td><td>2.150</td><td>0.0</td><td>2808</td></tr><tr><td>5760 min Summer</td><td>1.711</td><td>0.0</td><td>3632</td></tr><tr><td>7200 min Summer</td><td>1.432</td><td>0.0</td><td>4400</td></tr><tr><td>8640 min Summer</td><td>1.240</td><td>0.0</td><td>5184</td></tr><tr><td>10080 min Summer</td><td>1.098</td><td>0.0</td><td>5944</td></tr><tr><td>15 min 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Summer	0.173	0.173	0.1	8.3	O K	15 min Winter	0.136	0.136	0.1	6.5	O K	Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)	15 min Summer	125.353	0.0	19	30 min Summer	84.267	0.0	34	60 min Summer	54.074	0.0	64	120 min Summer	33.506	0.0	124	180 min Summer	24.949	0.0	182	240 min Summer	20.093	0.0	242	360 min Summer	14.773	0.0	362	480 min Summer	11.871	0.0	482	600 min Summer	10.010	0.0	602	720 min Summer	8.703	0.0	722	960 min Summer	6.973	0.0	960	1440 min Summer	5.093	0.0	1228	2160 min Summer	3.711	0.0	1600	2880 min Summer	2.961	0.0	1992	4320 min Summer	2.150	0.0	2808	5760 min Summer	1.711	0.0	3632	7200 min Summer	1.432	0.0	4400	8640 min Summer	1.240	0.0	5184	10080 min Summer	1.098	0.0	5944	15 min Winter	125.353	0.0	19
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Date 28/02/2017 17:31 File PERMEABLE ROAD 1.SRCX		Designed by LK/AC Checked by AMF			
Micro Drainage		Source Control 2015.1			
<u>Summary of Results for 100 year Return Period (+40%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	0.185	0.185	0.1	8.9	O K
60 min Winter	0.238	0.238	0.1	11.5	Flood Risk
120 min Winter	0.292	0.292	0.1	14.1	Flood Risk
180 min Winter	0.322	0.322	0.1	15.5	Flood Risk
240 min Winter	0.341	0.341	0.1	16.5	Flood Risk
360 min Winter	0.366	0.366	0.1	17.7	Flood Risk
480 min Winter	0.382	0.382	0.1	18.4	Flood Risk
600 min Winter	0.392	0.392	0.1	18.9	Flood Risk
720 min Winter	0.399	0.399	0.1	19.3	Flood Risk
960 min Winter	0.405	0.405	0.1	19.6	Flood Risk
1440 min Winter	0.401	0.401	0.1	19.4	Flood Risk
2160 min Winter	0.382	0.382	0.1	18.5	Flood Risk
2880 min Winter	0.362	0.362	0.1	17.5	Flood Risk
4320 min Winter	0.315	0.315	0.1	15.2	Flood Risk
5760 min Winter	0.269	0.269	0.1	13.0	Flood Risk
7200 min Winter	0.224	0.224	0.1	10.8	Flood Risk
8640 min Winter	0.184	0.184	0.1	8.9	O K
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Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)		
30 min Winter	84.267	0.0	33		
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180 min Winter	24.949	0.0	180		
240 min Winter	20.093	0.0	240		
360 min Winter	14.773	0.0	356		
480 min Winter	11.871	0.0	474		
600 min Winter	10.010	0.0	590		
720 min Winter	8.703	0.0	704		
960 min Winter	6.973	0.0	932		
1440 min Winter	5.093	0.0	1368		
2160 min Winter	3.711	0.0	1712		
2880 min Winter	2.961	0.0	2164		
4320 min Winter	2.150	0.0	3068		
5760 min Winter	1.711	0.0	3920		
7200 min Winter	1.432	0.0	4752		
8640 min Winter	1.240	0.0	5528		
10080 min Winter	1.098	0.0	6248		
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19 - 21 Silvermills Court Henderson Place Lane Edinburgh EH3 5DG	Havant Road, Emsworth SUDs Drainage Permeable Road 1	
Date 28/02/2017 17:31 File PERMEABLE ROAD 1.SRCX	Designed by LK/AC Checked by AMF	
Micro Drainage		Source Control 2015.1

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.100	Shortest Storm (mins)	15
Ratio R	0.350	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

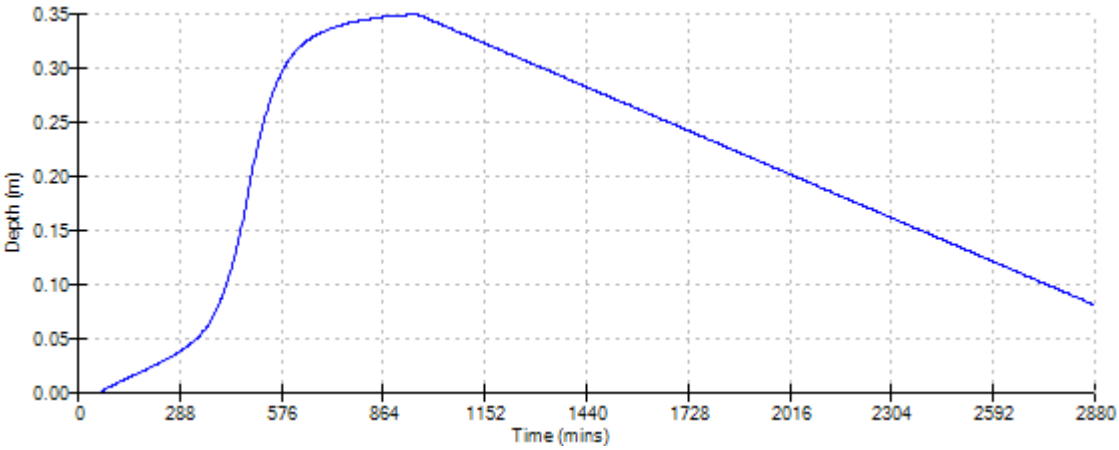
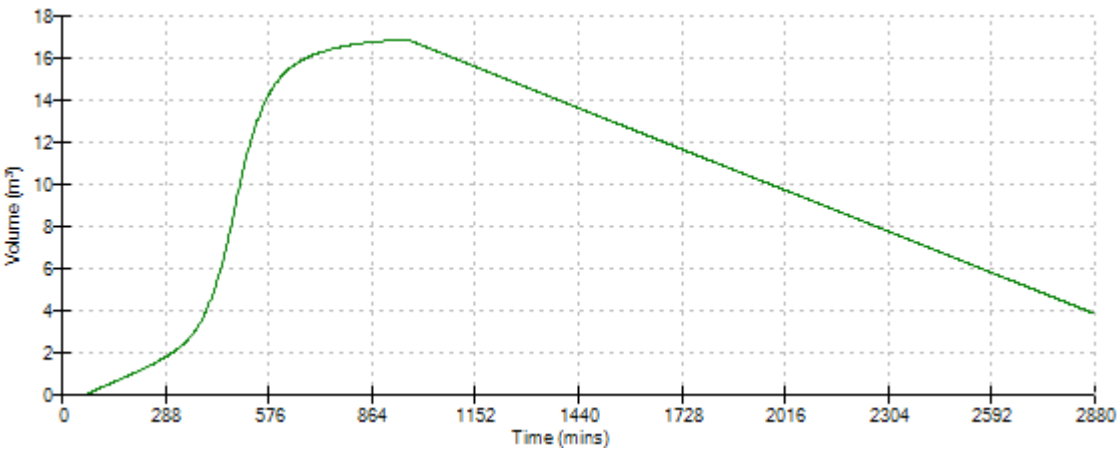
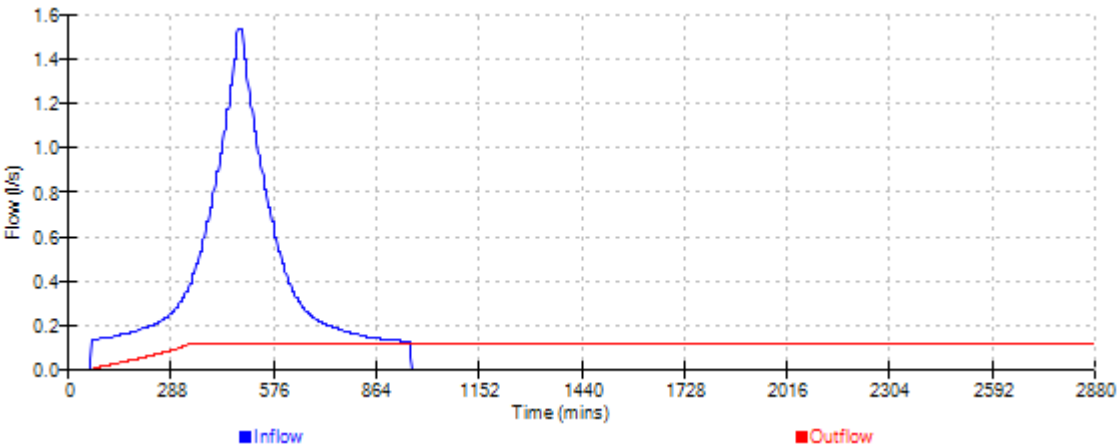
Time Area Diagram

Total Area (ha) 0.027

Time (mins) Area			Time (mins) Area		
From:	To:	(ha)	From:	To:	(ha)
0	2	0.014	2	4	0.013

Cundall, Johnston & Partners		Page 4																								
19 - 21 Silvermills Court Henderson Place Lane Edinburgh EH3 5DG	Havant Road, Emsworth SUDs Drainage Permeable Road 1																									
Date 28/02/2017 17:31 File PERMEABLE ROAD 1.SRCX	Designed by LK/AC Checked by AMF																									
Micro Drainage Source Control 2015.1																										
<u>Model Details</u> Storage is Online Cover Level (m) 0.510 <u>Porous Car Park Structure</u> <table> <tr> <td>Infiltration Coefficient Base (m/hr)</td> <td>0.00504</td> <td>Width (m)</td> <td>5.3</td> </tr> <tr> <td>Membrane Percolation (mm/hr)</td> <td>500</td> <td>Length (m)</td> <td>30.5</td> </tr> <tr> <td>Max Percolation (l/s)</td> <td>22.5</td> <td>Slope (1:X)</td> <td>10000.0</td> </tr> <tr> <td>Safety Factor</td> <td>2.0</td> <td>Depression Storage (mm)</td> <td>3</td> </tr> <tr> <td>Porosity</td> <td>0.30</td> <td>Evaporation (mm/day)</td> <td>1</td> </tr> <tr> <td>Invert Level (m)</td> <td>0.000</td> <td>Cap Volume Depth (m)</td> <td>0.410</td> </tr> </table>			Infiltration Coefficient Base (m/hr)	0.00504	Width (m)	5.3	Membrane Percolation (mm/hr)	500	Length (m)	30.5	Max Percolation (l/s)	22.5	Slope (1:X)	10000.0	Safety Factor	2.0	Depression Storage (mm)	3	Porosity	0.30	Evaporation (mm/day)	1	Invert Level (m)	0.000	Cap Volume Depth (m)	0.410
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Event: 960 min Summer



Cundall, Johnston & Partners					Page 1																																																																																																																																																																																																																		
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Summary of Results for 100 year Return Period (+40%) Half Drain Time : 223 minutes. <table><thead><tr><th>Storm Event</th><th>Max Level (m)</th><th>Max Depth (m)</th><th>Max Infiltration (l/s)</th><th>Max Volume (m³)</th><th>Status</th></tr></thead><tbody><tr><td>15 min Summer</td><td>0.134</td><td>0.134</td><td>3.2</td><td>36.6</td><td>O K</td></tr><tr><td>30 min Summer</td><td>0.176</td><td>0.176</td><td>3.2</td><td>48.8</td><td>Flood Risk</td></tr><tr><td>60 min Summer</td><td>0.215</td><td>0.215</td><td>3.2</td><td>60.1</td><td>Flood Risk</td></tr><tr><td>120 min Summer</td><td>0.243</td><td>0.243</td><td>3.2</td><td>68.4</td><td>Flood Risk</td></tr><tr><td>180 min Summer</td><td>0.248</td><td>0.248</td><td>3.2</td><td>69.8</td><td>Flood Risk</td></tr><tr><td>240 min Summer</td><td>0.247</td><td>0.247</td><td>3.2</td><td>69.4</td><td>Flood Risk</td></tr><tr><td>360 min Summer</td><td>0.240</td><td>0.240</td><td>3.2</td><td>67.3</td><td>Flood Risk</td></tr><tr><td>480 min Summer</td><td>0.230</td><td>0.230</td><td>3.2</td><td>64.6</td><td>Flood Risk</td></tr><tr><td>600 min Summer</td><td>0.220</td><td>0.220</td><td>3.2</td><td>61.6</td><td>Flood Risk</td></tr><tr><td>720 min Summer</td><td>0.210</td><td>0.210</td><td>3.2</td><td>58.5</td><td>Flood Risk</td></tr><tr><td>960 min Summer</td><td>0.188</td><td>0.188</td><td>3.2</td><td>52.3</td><td>Flood Risk</td></tr><tr><td>1440 min Summer</td><td>0.149</td><td>0.149</td><td>3.2</td><td>41.0</td><td>O K</td></tr><tr><td>2160 min Summer</td><td>0.102</td><td>0.102</td><td>3.2</td><td>27.2</td><td>O K</td></tr><tr><td>2880 min Summer</td><td>0.070</td><td>0.070</td><td>3.2</td><td>17.8</td><td>O K</td></tr><tr><td>4320 min Summer</td><td>0.045</td><td>0.045</td><td>2.9</td><td>10.6</td><td>O K</td></tr><tr><td>5760 min Summer</td><td>0.037</td><td>0.037</td><td>2.4</td><td>8.1</td><td>O K</td></tr><tr><td>7200 min Summer</td><td>0.031</td><td>0.031</td><td>2.0</td><td>6.5</td><td>O K</td></tr><tr><td>8640 min Summer</td><td>0.027</td><td>0.027</td><td>1.8</td><td>5.3</td><td>O K</td></tr><tr><td>10080 min Summer</td><td>0.024</td><td>0.024</td><td>1.6</td><td>4.4</td><td>O K</td></tr><tr><td>15 min Winter</td><td>0.151</td><td>0.151</td><td>3.2</td><td>41.5</td><td>Flood Risk</td></tr></tbody></table> <table><thead><tr><th>Storm Event</th><th>Rain (mm/hr)</th><th>Flooded Volume (m³)</th><th>Time-Peak (mins)</th></tr></thead><tbody><tr><td>15 min Summer</td><td>125.353</td><td>0.0</td><td>17</td></tr><tr><td>30 min Summer</td><td>84.267</td><td>0.0</td><td>31</td></tr><tr><td>60 min Summer</td><td>54.074</td><td>0.0</td><td>62</td></tr><tr><td>120 min Summer</td><td>33.506</td><td>0.0</td><td>120</td></tr><tr><td>180 min Summer</td><td>24.949</td><td>0.0</td><td>170</td></tr><tr><td>240 min Summer</td><td>20.093</td><td>0.0</td><td>198</td></tr><tr><td>360 min Summer</td><td>14.773</td><td>0.0</td><td>260</td></tr><tr><td>480 min 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Cundall, Johnston & Partners					Page 2
19 - 21 Silvermills Court		Havant Road, Emsworth			
Henderson Place Lane		SUDs Drainage			
Edinburgh EH3 5DG		Permeable Road 2			
Date 01/03/2017 13:26		Designed by LK/AC			
File PERMEABLE ROAD 2.SRCX		Checked by AMF			
Micro Drainage		Source Control 2015.1			
<u>Summary of Results for 100 year Return Period (+40%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	0.199	0.199	3.2	55.4	Flood Risk
60 min Winter	0.244	0.244	3.2	68.6	Flood Risk
120 min Winter	0.279	0.279	3.2	78.8	Flood Risk
180 min Winter	0.288	0.288	3.2	81.4	Flood Risk
240 min Winter	0.286	0.286	3.2	80.9	Flood Risk
360 min Winter	0.275	0.275	3.2	77.7	Flood Risk
480 min Winter	0.262	0.262	3.2	73.9	Flood Risk
600 min Winter	0.247	0.247	3.2	69.4	Flood Risk
720 min Winter	0.231	0.231	3.2	64.6	Flood Risk
960 min Winter	0.198	0.198	3.2	55.0	Flood Risk
1440 min Winter	0.138	0.138	3.2	37.5	O K
2160 min Winter	0.071	0.071	3.2	18.2	O K
2880 min Winter	0.047	0.047	3.0	10.9	O K
4320 min Winter	0.034	0.034	2.2	7.3	O K
5760 min Winter	0.027	0.027	1.8	5.3	O K
7200 min Winter	0.023	0.023	1.5	4.0	O K
8640 min Winter	0.020	0.020	1.3	3.2	O K
10080 min Winter	0.018	0.018	1.2	2.6	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)		
30 min Winter	84.267	0.0	31		
60 min Winter	54.074	0.0	60		
120 min Winter	33.506	0.0	118		
180 min Winter	24.949	0.0	174		
240 min Winter	20.093	0.0	226		
360 min Winter	14.773	0.0	280		
480 min Winter	11.871	0.0	358		
600 min Winter	10.010	0.0	434		
720 min Winter	8.703	0.0	506		
960 min Winter	6.973	0.0	646		
1440 min Winter	5.093	0.0	908		
2160 min Winter	3.711	0.0	1236		
2880 min Winter	2.961	0.0	1500		
4320 min Winter	2.150	0.0	2244		
5760 min Winter	1.711	0.0	2992		
7200 min Winter	1.432	0.0	3656		
8640 min Winter	1.240	0.0	4416		
10080 min Winter	1.098	0.0	5056		
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19 - 21 Silvermills Court Henderson Place Lane Edinburgh EH3 5DG	Havant Road, Emsworth SUDs Drainage Permeable Road 2	
Date 01/03/2017 13:26 File PERMEABLE ROAD 2.SRCX	Designed by LK/AC Checked by AMF	
Micro Drainage Source Control 2015.1		

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.100	Shortest Storm (mins)	15
Ratio R	0.350	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

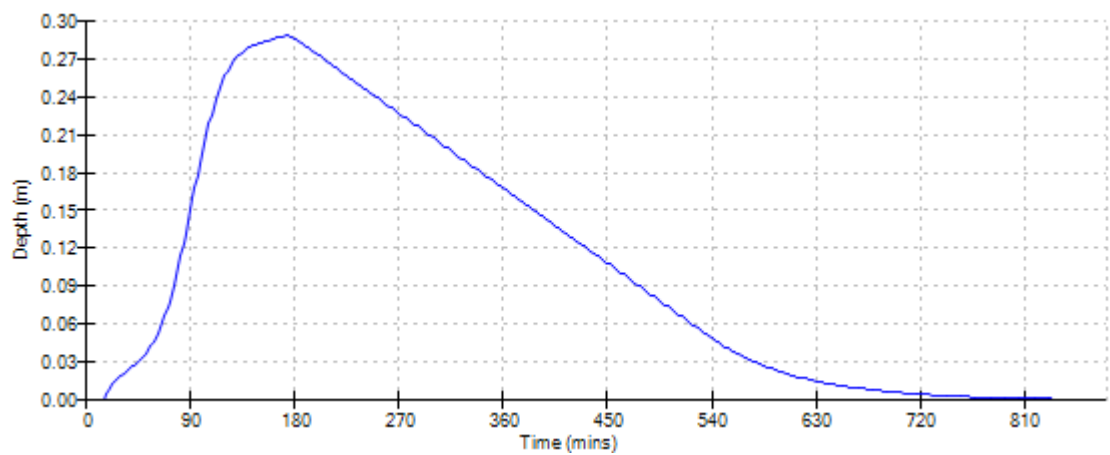
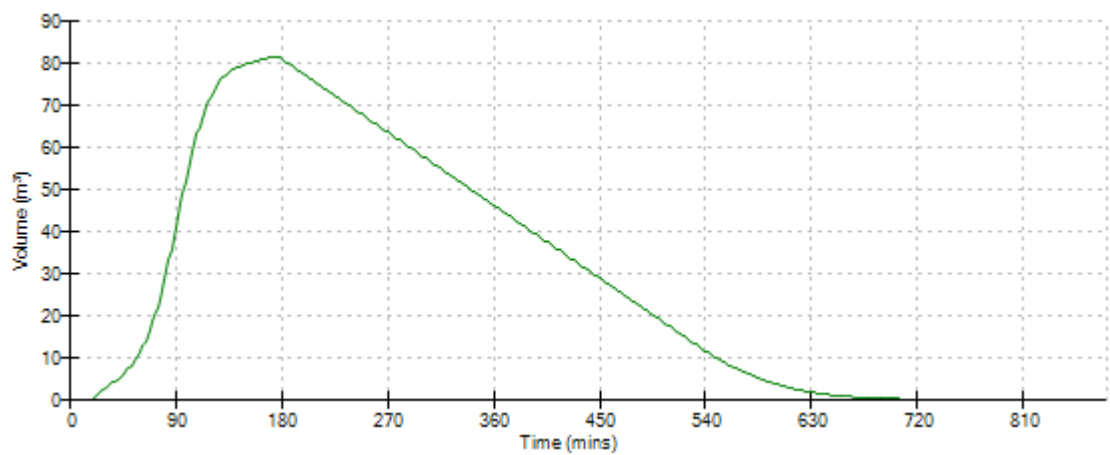
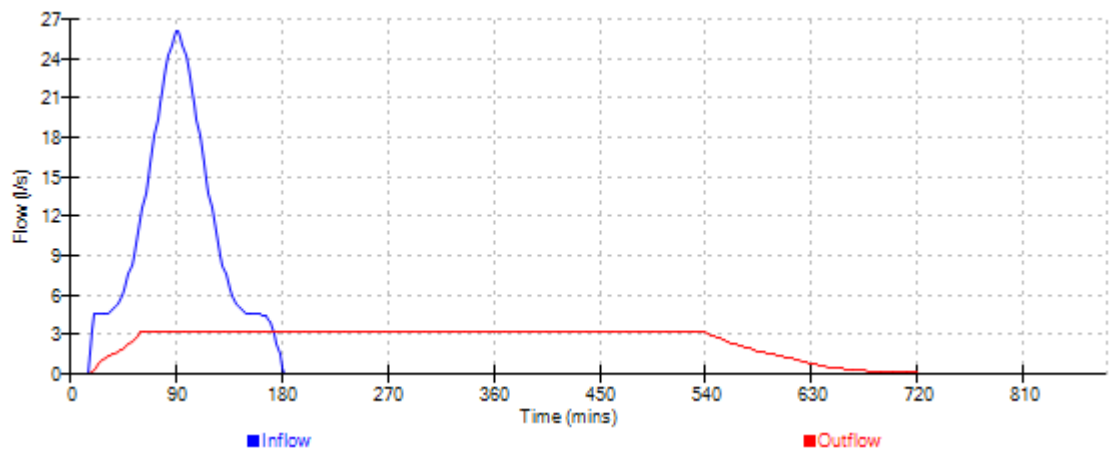
Total Area (ha) 0.177

Time (mins)	Area	Time (mins)	Area
From: To:	(ha)	From: To:	(ha)
0	1 0.089	1	2 0.088

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19 - 21 Silvermills Court Henderson Place Lane Edinburgh EH3 5DG	Havant Road, Emsworth SUDs Drainage Permeable Road 2																									
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Event: 180 min Winter

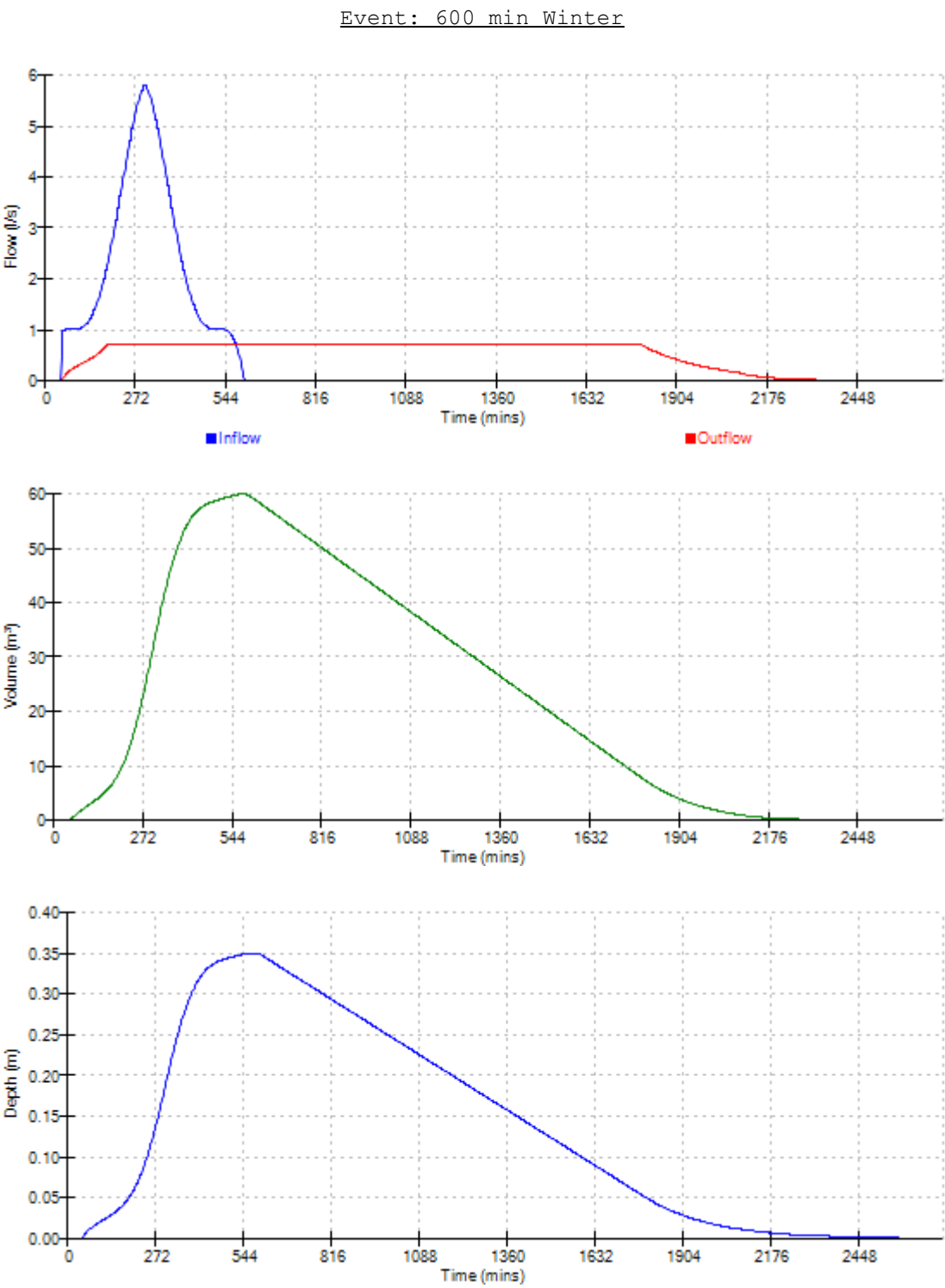


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<u>Summary of Results for 100 year Return Period (+40%)</u> Half Drain Time : 699 minutes. <table><thead><tr><th>Storm Event</th><th>Max Level (m)</th><th>Max Depth (m)</th><th>Max Infiltration (l/s)</th><th>Max Volume (m³)</th><th>Status</th></tr></thead><tbody><tr><td>15 min Summer</td><td>0.125</td><td>0.125</td><td>0.7</td><td>20.8</td><td>O K</td></tr><tr><td>30 min Summer</td><td>0.168</td><td>0.168</td><td>0.7</td><td>28.2</td><td>O K</td></tr><tr><td>60 min Summer</td><td>0.213</td><td>0.213</td><td>0.7</td><td>36.0</td><td>Flood Risk</td></tr><tr><td>120 min Summer</td><td>0.256</td><td>0.256</td><td>0.7</td><td>43.5</td><td>Flood Risk</td></tr><tr><td>180 min Summer</td><td>0.277</td><td>0.277</td><td>0.7</td><td>47.2</td><td>Flood Risk</td></tr><tr><td>240 min Summer</td><td>0.289</td><td>0.289</td><td>0.7</td><td>49.2</td><td>Flood Risk</td></tr><tr><td>360 min Summer</td><td>0.300</td><td>0.300</td><td>0.7</td><td>51.1</td><td>Flood Risk</td></tr><tr><td>480 min Summer</td><td>0.302</td><td>0.302</td><td>0.7</td><td>51.5</td><td>Flood Risk</td></tr><tr><td>600 min Summer</td><td>0.301</td><td>0.301</td><td>0.7</td><td>51.3</td><td>Flood Risk</td></tr><tr><td>720 min Summer</td><td>0.298</td><td>0.298</td><td>0.7</td><td>50.8</td><td>Flood Risk</td></tr><tr><td>960 min Summer</td><td>0.292</td><td>0.292</td><td>0.7</td><td>49.7</td><td>Flood Risk</td></tr><tr><td>1440 min Summer</td><td>0.276</td><td>0.276</td><td>0.7</td><td>46.9</td><td>Flood Risk</td></tr><tr><td>2160 min Summer</td><td>0.249</td><td>0.249</td><td>0.7</td><td>42.3</td><td>Flood Risk</td></tr><tr><td>2880 min Summer</td><td>0.223</td><td>0.223</td><td>0.7</td><td>37.8</td><td>Flood Risk</td></tr><tr><td>4320 min Summer</td><td>0.176</td><td>0.176</td><td>0.7</td><td>29.5</td><td>O K</td></tr><tr><td>5760 min Summer</td><td>0.135</td><td>0.135</td><td>0.7</td><td>22.5</td><td>O K</td></tr><tr><td>7200 min Summer</td><td>0.103</td><td>0.103</td><td>0.7</td><td>16.8</td><td>O K</td></tr><tr><td>8640 min Summer</td><td>0.079</td><td>0.079</td><td>0.7</td><td>12.7</td><td>O K</td></tr><tr><td>10080 min Summer</td><td>0.061</td><td>0.061</td><td>0.7</td><td>9.7</td><td>O K</td></tr><tr><td>15 min Winter</td><td>0.141</td><td>0.141</td><td>0.7</td><td>23.5</td><td>O K</td></tr></tbody></table> <table><thead><tr><th>Storm Event</th><th>Rain (mm/hr)</th><th>Flooded Volume (m³)</th><th>Time-Peak (mins)</th></tr></thead><tbody><tr><td>15 min Summer</td><td>125.353</td><td>0.0</td><td>19</td></tr><tr><td>30 min Summer</td><td>84.267</td><td>0.0</td><td>33</td></tr><tr><td>60 min Summer</td><td>54.074</td><td>0.0</td><td>64</td></tr><tr><td>120 min Summer</td><td>33.506</td><td>0.0</td><td>122</td></tr><tr><td>180 min Summer</td><td>24.949</td><td>0.0</td><td>182</td></tr><tr><td>240 min Summer</td><td>20.093</td><td>0.0</td><td>242</td></tr><tr><td>360 min Summer</td><td>14.773</td><td>0.0</td><td>360</td></tr><tr><td>480 min Summer</td><td>11.871</td><td>0.0</td><td>480</td></tr><tr><td>600 min Summer</td><td>10.010</td><td>0.0</td><td>558</td></tr><tr><td>720 min Summer</td><td>8.703</td><td>0.0</td><td>608</td></tr><tr><td>960 min Summer</td><td>6.973</td><td>0.0</td><td>732</td></tr><tr><td>1440 min Summer</td><td>5.093</td><td>0.0</td><td>996</td></tr><tr><td>2160 min Summer</td><td>3.711</td><td>0.0</td><td>1404</td></tr><tr><td>2880 min Summer</td><td>2.961</td><td>0.0</td><td>1812</td></tr><tr><td>4320 min Summer</td><td>2.150</td><td>0.0</td><td>2592</td></tr><tr><td>5760 min Summer</td><td>1.711</td><td>0.0</td><td>3296</td></tr><tr><td>7200 min Summer</td><td>1.432</td><td>0.0</td><td>3968</td></tr><tr><td>8640 min Summer</td><td>1.240</td><td>0.0</td><td>4672</td></tr><tr><td>10080 min Summer</td><td>1.098</td><td>0.0</td><td>5336</td></tr><tr><td>15 min Winter</td><td>125.353</td><td>0.0</td><td>19</td></tr></tbody></table>						Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status	15 min Summer	0.125	0.125	0.7	20.8	O K	30 min Summer	0.168	0.168	0.7	28.2	O K	60 min Summer	0.213	0.213	0.7	36.0	Flood Risk	120 min Summer	0.256	0.256	0.7	43.5	Flood Risk	180 min Summer	0.277	0.277	0.7	47.2	Flood Risk	240 min Summer	0.289	0.289	0.7	49.2	Flood Risk	360 min Summer	0.300	0.300	0.7	51.1	Flood Risk	480 min Summer	0.302	0.302	0.7	51.5	Flood Risk	600 min Summer	0.301	0.301	0.7	51.3	Flood Risk	720 min Summer	0.298	0.298	0.7	50.8	Flood Risk	960 min Summer	0.292	0.292	0.7	49.7	Flood Risk	1440 min Summer	0.276	0.276	0.7	46.9	Flood Risk	2160 min Summer	0.249	0.249	0.7	42.3	Flood Risk	2880 min Summer	0.223	0.223	0.7	37.8	Flood Risk	4320 min Summer	0.176	0.176	0.7	29.5	O K	5760 min Summer	0.135	0.135	0.7	22.5	O K	7200 min Summer	0.103	0.103	0.7	16.8	O K	8640 min Summer	0.079	0.079	0.7	12.7	O K	10080 min Summer	0.061	0.061	0.7	9.7	O K	15 min Winter	0.141	0.141	0.7	23.5	O K	Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)	15 min Summer	125.353	0.0	19	30 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19 - 21 Silvermills Court		Havant Road, Emsworth			
Henderson Place Lane		SUDs Drainage			
Edinburgh EH3 5DG		Permeable Road 3			
Date 01/03/2017 11:01		Designed by LK/AC			
File PERMEABLE ROAD 3.SRCX		Checked by AMF			
Micro Drainage		Source Control 2015.1			
<u>Summary of Results for 100 year Return Period (+40%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	0.190	0.190	0.7	31.9	O K
60 min Winter	0.240	0.240	0.7	40.8	Flood Risk
120 min Winter	0.290	0.290	0.7	49.3	Flood Risk
180 min Winter	0.315	0.315	0.7	53.7	Flood Risk
240 min Winter	0.329	0.329	0.7	56.2	Flood Risk
360 min Winter	0.344	0.344	0.7	58.8	Flood Risk
480 min Winter	0.350	0.350	0.7	59.8	Flood Risk
600 min Winter	0.350	0.350	0.7	59.9	Flood Risk
720 min Winter	0.348	0.348	0.7	59.5	Flood Risk
960 min Winter	0.337	0.337	0.7	57.7	Flood Risk
1440 min Winter	0.316	0.316	0.7	53.9	Flood Risk
2160 min Winter	0.277	0.277	0.7	47.1	Flood Risk
2880 min Winter	0.237	0.237	0.7	40.1	Flood Risk
4320 min Winter	0.164	0.164	0.7	27.4	O K
5760 min Winter	0.105	0.105	0.7	17.2	O K
7200 min Winter	0.064	0.064	0.7	10.1	O K
8640 min Winter	0.048	0.048	0.7	7.3	O K
10080 min Winter	0.043	0.043	0.6	6.4	O K
Storm Event	Rain (mm/hr)		Flooded Volume (m³)	Time-Peak (mins)	
30 min Winter	84.267		0.0	33	
60 min Winter	54.074		0.0	62	
120 min Winter	33.506		0.0	120	
180 min Winter	24.949		0.0	180	
240 min Winter	20.093		0.0	238	
360 min Winter	14.773		0.0	352	
480 min Winter	11.871		0.0	466	
600 min Winter	10.010		0.0	576	
720 min Winter	8.703		0.0	680	
960 min Winter	6.973		0.0	788	
1440 min Winter	5.093		0.0	1082	
2160 min Winter	3.711		0.0	1532	
2880 min Winter	2.961		0.0	1960	
4320 min Winter	2.150		0.0	2728	
5760 min Winter	1.711		0.0	3456	
7200 min Winter	1.432		0.0	4032	
8640 min Winter	1.240		0.0	4496	
10080 min Winter	1.098		0.0	5152	
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<u>Model Details</u> Storage is Online Cover Level (m) 0.500 <u>Porous Car Park Structure</u> <table> <tr> <td>Infiltration Coefficient Base (m/hr)</td> <td>0.00900</td> <td>Width (m)</td> <td>4.9</td> </tr> <tr> <td>Membrane Percolation (mm/hr)</td> <td>500</td> <td>Length (m)</td> <td>118.3</td> </tr> <tr> <td>Max Percolation (l/s)</td> <td>80.5</td> <td>Slope (1:X)</td> <td>10000.0</td> </tr> <tr> <td>Safety Factor</td> <td>2.0</td> <td>Depression Storage (mm)</td> <td>3</td> </tr> <tr> <td>Porosity</td> <td>0.30</td> <td>Evaporation (mm/day)</td> <td>1</td> </tr> <tr> <td>Invert Level (m)</td> <td>0.000</td> <td>Cap Volume Depth (m)</td> <td>0.400</td> </tr> </table>			Infiltration Coefficient Base (m/hr)	0.00900	Width (m)	4.9	Membrane Percolation (mm/hr)	500	Length (m)	118.3	Max Percolation (l/s)	80.5	Slope (1:X)	10000.0	Safety Factor	2.0	Depression Storage (mm)	3	Porosity	0.30	Evaporation (mm/day)	1	Invert Level (m)	0.000	Cap Volume Depth (m)	0.400
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<u>Summary of Results for 100 year Return Period (+40%)</u> Half Drain Time : 226 minutes. <table><thead><tr><th>Storm Event</th><th>Max Level (m)</th><th>Max Depth (m)</th><th>Max Infiltration (l/s)</th><th>Max Volume (m³)</th><th>Status</th></tr></thead><tbody><tr><td>15 min Summer</td><td>0.121</td><td>0.121</td><td>1.7</td><td>19.3</td><td>O K</td></tr><tr><td>30 min Summer</td><td>0.161</td><td>0.161</td><td>1.7</td><td>25.9</td><td>Flood Risk</td></tr><tr><td>60 min Summer</td><td>0.198</td><td>0.198</td><td>1.7</td><td>32.1</td><td>Flood Risk</td></tr><tr><td>120 min Summer</td><td>0.227</td><td>0.227</td><td>1.7</td><td>36.8</td><td>Flood Risk</td></tr><tr><td>180 min Summer</td><td>0.233</td><td>0.233</td><td>1.7</td><td>37.9</td><td>Flood Risk</td></tr><tr><td>240 min Summer</td><td>0.232</td><td>0.232</td><td>1.7</td><td>37.8</td><td>Flood Risk</td></tr><tr><td>360 min Summer</td><td>0.227</td><td>0.227</td><td>1.7</td><td>37.0</td><td>Flood Risk</td></tr><tr><td>480 min Summer</td><td>0.220</td><td>0.220</td><td>1.7</td><td>35.7</td><td>Flood Risk</td></tr><tr><td>600 min Summer</td><td>0.211</td><td>0.211</td><td>1.7</td><td>34.3</td><td>Flood Risk</td></tr><tr><td>720 min Summer</td><td>0.202</td><td>0.202</td><td>1.7</td><td>32.7</td><td>Flood Risk</td></tr><tr><td>960 min Summer</td><td>0.183</td><td>0.183</td><td>1.7</td><td>29.6</td><td>Flood Risk</td></tr><tr><td>1440 min Summer</td><td>0.147</td><td>0.147</td><td>1.7</td><td>23.7</td><td>O K</td></tr><tr><td>2160 min Summer</td><td>0.103</td><td>0.103</td><td>1.7</td><td>16.4</td><td>O K</td></tr><tr><td>2880 min Summer</td><td>0.072</td><td>0.072</td><td>1.7</td><td>11.3</td><td>O K</td></tr><tr><td>4320 min Summer</td><td>0.046</td><td>0.046</td><td>1.5</td><td>7.0</td><td>O K</td></tr><tr><td>5760 min Summer</td><td>0.038</td><td>0.038</td><td>1.2</td><td>5.6</td><td>O K</td></tr><tr><td>7200 min Summer</td><td>0.032</td><td>0.032</td><td>1.1</td><td>4.7</td><td>O K</td></tr><tr><td>8640 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Volume (m³)	Status	15 min Summer	0.121	0.121	1.7	19.3	O K	30 min Summer	0.161	0.161	1.7	25.9	Flood Risk	60 min Summer	0.198	0.198	1.7	32.1	Flood Risk	120 min Summer	0.227	0.227	1.7	36.8	Flood Risk	180 min Summer	0.233	0.233	1.7	37.9	Flood Risk	240 min Summer	0.232	0.232	1.7	37.8	Flood Risk	360 min Summer	0.227	0.227	1.7	37.0	Flood Risk	480 min Summer	0.220	0.220	1.7	35.7	Flood Risk	600 min Summer	0.211	0.211	1.7	34.3	Flood Risk	720 min Summer	0.202	0.202	1.7	32.7	Flood Risk	960 min Summer	0.183	0.183	1.7	29.6	Flood Risk	1440 min Summer	0.147	0.147	1.7	23.7	O K	2160 min Summer	0.103	0.103	1.7	16.4	O K	2880 min Summer	0.072	0.072	1.7	11.3	O K	4320 min Summer	0.046	0.046	1.5	7.0	O K	5760 min Summer	0.038	0.038	1.2	5.6	O K	7200 min Summer	0.032	0.032	1.1	4.7	O K	8640 min Summer	0.028	0.028	0.9	4.0	O K	10080 min Summer	0.025	0.025	0.8	3.5	O K	15 min Winter	0.137	0.137	1.7	21.9	O K	Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)	15 min Summer	125.353	0.0	18	30 min Summer	84.267	0.0	33	60 min Summer	54.074	0.0	62	120 min Summer	33.506	0.0	120	180 min Summer	24.949	0.0	174	240 min Summer	20.093	0.0	202	360 min Summer	14.773	0.0	264	480 min Summer	11.871	0.0	332	600 min Summer	10.010	0.0	400	720 min Summer	8.703	0.0	468	960 min Summer	6.973	0.0	604	1440 min Summer	5.093	0.0	864	2160 min Summer	3.711	0.0	1216	2880 min Summer	2.961	0.0	1556	4320 min Summer	2.150	0.0	2208	5760 min Summer	1.711	0.0	2944	7200 min Summer	1.432	0.0	3672	8640 min Summer	1.240	0.0	4408	10080 min Summer	1.098	0.0	5136	15 min Winter	125.353	0.0	18
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Cundall, Johnston & Partners				Page 2	
19 - 21 Silvermills Court Henderson Place Lane Edinburgh EH3 5DG		Havant Road, Emsworth SUDs Drainage Permeable Road 4			
Date 01/03/2017 14:26 File PERMEABLE ROAD 4.SRCX		Designed by LK/AC Checked by AMF			
Micro Drainage		Source Control 2015.1			
<u>Summary of Results for 100 year Return Period (+40%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	0.182	0.182	1.7	29.4	Flood Risk
60 min Winter	0.225	0.225	1.7	36.6	Flood Risk
120 min Winter	0.260	0.260	1.7	42.3	Flood Risk
180 min Winter	0.270	0.270	1.7	44.0	Flood Risk
240 min Winter	0.270	0.270	1.7	43.9	Flood Risk
360 min Winter	0.261	0.261	1.7	42.5	Flood Risk
480 min Winter	0.251	0.251	1.7	40.8	Flood Risk
600 min Winter	0.237	0.237	1.7	38.6	Flood Risk
720 min Winter	0.223	0.223	1.7	36.2	Flood Risk
960 min Winter	0.193	0.193	1.7	31.3	Flood Risk
1440 min Winter	0.138	0.138	1.7	22.2	O K
2160 min Winter	0.075	0.075	1.7	11.8	O K
2880 min Winter	0.048	0.048	1.6	7.3	O K
4320 min Winter	0.035	0.035	1.2	5.2	O K
5760 min Winter	0.028	0.028	0.9	4.0	O K
7200 min Winter	0.024	0.024	0.8	3.3	O K
8640 min Winter	0.021	0.021	0.7	2.8	O K
10080 min Winter	0.018	0.018	0.6	2.3	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)		
30 min Winter	84.267	0.0	32		
60 min Winter	54.074	0.0	62		
120 min Winter	33.506	0.0	118		
180 min Winter	24.949	0.0	174		
240 min Winter	20.093	0.0	228		
360 min Winter	14.773	0.0	284		
480 min Winter	11.871	0.0	362		
600 min Winter	10.010	0.0	436		
720 min Winter	8.703	0.0	512		
960 min Winter	6.973	0.0	654		
1440 min Winter	5.093	0.0	912		
2160 min Winter	3.711	0.0	1252		
2880 min Winter	2.961	0.0	1524		
4320 min Winter	2.150	0.0	2248		
5760 min Winter	1.711	0.0	2944		
7200 min Winter	1.432	0.0	3672		
8640 min Winter	1.240	0.0	4352		
10080 min Winter	1.098	0.0	5000		
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Date 01/03/2017 14:26 File PERMEABLE ROAD 4.SRCX	Designed by LK/AC Checked by AMF	
Micro Drainage		Source Control 2015.1

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.100	Shortest Storm (mins)	15
Ratio R	0.350	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

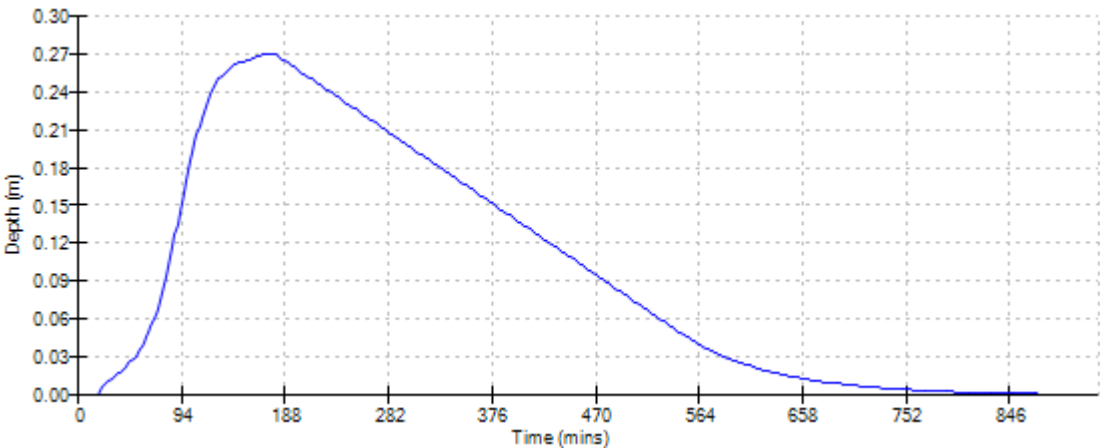
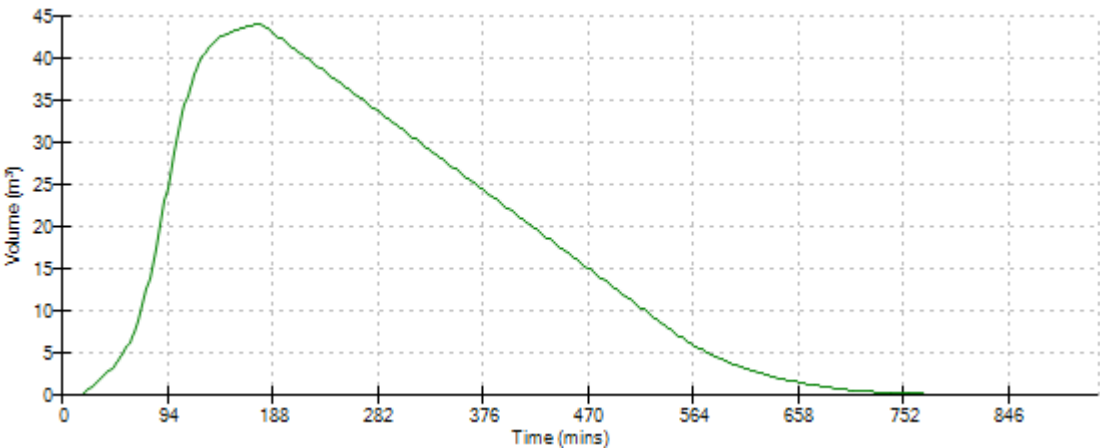
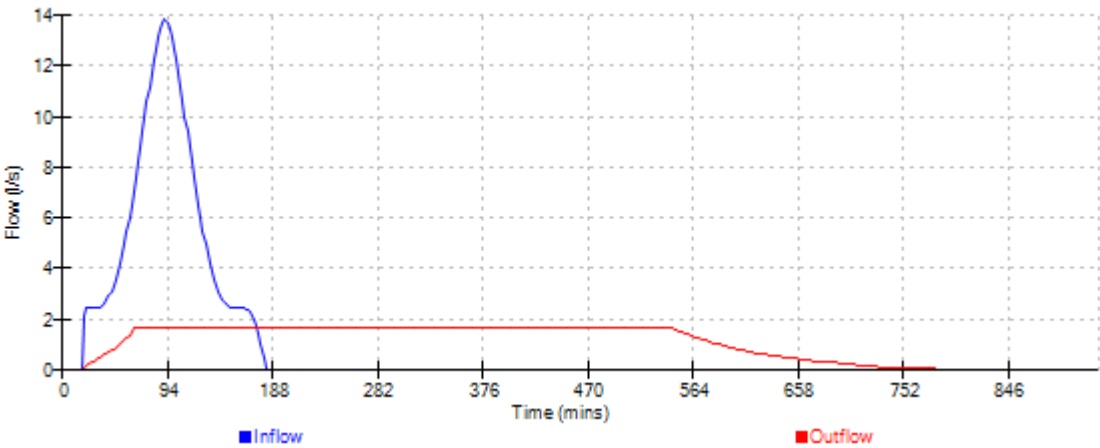
Time Area Diagram

Total Area (ha) 0.094

Time (mins)	Area	Time (mins)	Area
From: To:	(ha)	From: To:	(ha)
0 2	0.047	2 4	0.047

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<u>Model Details</u> Storage is Online Cover Level (m) 0.450 <u>Porous Car Park Structure</u> <table> <tr> <td>Infiltration Coefficient Base (m/hr)</td> <td>0.02160</td> <td>Width (m)</td> <td>7.1</td> </tr> <tr> <td>Membrane Percolation (mm/hr)</td> <td>500</td> <td>Length (m)</td> <td>77.6</td> </tr> <tr> <td>Max Percolation (l/s)</td> <td>76.5</td> <td>Slope (1:X)</td> <td>10000.0</td> </tr> <tr> <td>Safety Factor</td> <td>2.0</td> <td>Depression Storage (mm)</td> <td>3</td> </tr> <tr> <td>Porosity</td> <td>0.30</td> <td>Evaporation (mm/day)</td> <td>1</td> </tr> <tr> <td>Invert Level (m)</td> <td>0.000</td> <td>Cap Volume Depth (m)</td> <td>0.350</td> </tr> </table>			Infiltration Coefficient Base (m/hr)	0.02160	Width (m)	7.1	Membrane Percolation (mm/hr)	500	Length (m)	77.6	Max Percolation (l/s)	76.5	Slope (1:X)	10000.0	Safety Factor	2.0	Depression Storage (mm)	3	Porosity	0.30	Evaporation (mm/day)	1	Invert Level (m)	0.000	Cap Volume Depth (m)	0.350
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Event: 180 min Winter



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Summer</td><td>0.153</td><td>0.153</td><td>2.5</td><td>41.9</td><td>Flood Risk</td></tr><tr><td>600 min Summer</td><td>0.145</td><td>0.145</td><td>2.5</td><td>39.6</td><td>Flood Risk</td></tr><tr><td>720 min Summer</td><td>0.137</td><td>0.137</td><td>2.5</td><td>37.3</td><td>Flood Risk</td></tr><tr><td>960 min Summer</td><td>0.122</td><td>0.122</td><td>2.5</td><td>32.9</td><td>Flood Risk</td></tr><tr><td>1440 min Summer</td><td>0.095</td><td>0.095</td><td>2.5</td><td>25.0</td><td>O K</td></tr><tr><td>2160 min Summer</td><td>0.065</td><td>0.065</td><td>2.5</td><td>16.4</td><td>O K</td></tr><tr><td>2880 min Summer</td><td>0.050</td><td>0.050</td><td>2.5</td><td>11.8</td><td>O K</td></tr><tr><td>4320 min Summer</td><td>0.038</td><td>0.038</td><td>1.9</td><td>8.4</td><td>O K</td></tr><tr><td>5760 min Summer</td><td>0.031</td><td>0.031</td><td>1.6</td><td>6.4</td><td>O K</td></tr><tr><td>7200 min Summer</td><td>0.027</td><td>0.027</td><td>1.4</td><td>5.1</td><td>O K</td></tr><tr><td>8640 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Summer</td><td>10.010</td><td>0.0</td><td>386</td></tr><tr><td>720 min Summer</td><td>8.703</td><td>0.0</td><td>454</td></tr><tr><td>960 min Summer</td><td>6.973</td><td>0.0</td><td>586</td></tr><tr><td>1440 min Summer</td><td>5.093</td><td>0.0</td><td>836</td></tr><tr><td>2160 min Summer</td><td>3.711</td><td>0.0</td><td>1188</td></tr><tr><td>2880 min Summer</td><td>2.961</td><td>0.0</td><td>1500</td></tr><tr><td>4320 min Summer</td><td>2.150</td><td>0.0</td><td>2244</td></tr><tr><td>5760 min Summer</td><td>1.711</td><td>0.0</td><td>2944</td></tr><tr><td>7200 min Summer</td><td>1.432</td><td>0.0</td><td>3672</td></tr><tr><td>8640 min Summer</td><td>1.240</td><td>0.0</td><td>4408</td></tr><tr><td>10080 min Summer</td><td>1.098</td><td>0.0</td><td>5136</td></tr><tr><td>15 min Winter</td><td>125.353</td><td>0.0</td><td>16</td></tr></table>						Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status	15 min Summer	0.091	0.091	2.5	23.8	O K	30 min Summer	0.119	0.119	2.5	32.0	Flood Risk	60 min Summer	0.144	0.144	2.5	39.5	Flood Risk	120 min Summer	0.162	0.162	2.5	44.6	Flood Risk	180 min Summer	0.165	0.165	2.5	45.4	Flood Risk	240 min Summer	0.164	0.164	2.5	45.2	Flood Risk	360 min Summer	0.159	0.159	2.5	43.8	Flood Risk	480 min Summer	0.153	0.153	2.5	41.9	Flood Risk	600 min Summer	0.145	0.145	2.5	39.6	Flood Risk	720 min Summer	0.137	0.137	2.5	37.3	Flood Risk	960 min Summer	0.122	0.122	2.5	32.9	Flood Risk	1440 min Summer	0.095	0.095	2.5	25.0	O K	2160 min Summer	0.065	0.065	2.5	16.4	O K	2880 min Summer	0.050	0.050	2.5	11.8	O K	4320 min Summer	0.038	0.038	1.9	8.4	O K	5760 min Summer	0.031	0.031	1.6	6.4	O K	7200 min Summer	0.027	0.027	1.4	5.1	O K	8640 min Summer	0.023	0.023	1.2	4.1	O K	10080 min Summer	0.021	0.021	1.0	3.4	O K	15 min Winter	0.102	0.102	2.5	27.1	Flood Risk	Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)	15 min Summer	125.353	0.0	17	30 min Summer	84.267	0.0	31	60 min Summer	54.074	0.0	60	120 min Summer	33.506	0.0	120	180 min Summer	24.949	0.0	154	240 min Summer	20.093	0.0	184	360 min Summer	14.773	0.0	250	480 min Summer	11.871	0.0	318	600 min Summer	10.010	0.0	386	720 min Summer	8.703	0.0	454	960 min Summer	6.973	0.0	586	1440 min Summer	5.093	0.0	836	2160 min Summer	3.711	0.0	1188	2880 min Summer	2.961	0.0	1500	4320 min Summer	2.150	0.0	2244	5760 min Summer	1.711	0.0	2944	7200 min Summer	1.432	0.0	3672	8640 min Summer	1.240	0.0	4408	10080 min Summer	1.098	0.0	5136	15 min Winter	125.353	0.0	16
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Cundall, Johnston & Partners				Page 2	
19 - 21 Silvermills Court		Havant Road, Emsworth			
Henderson Place Lane		SUDs Drainage			
Edinburgh EH3 5DG		Permeable Road 5			
Date 01/03/2017 16:27		Designed by LK/AC			
File PERMEABLE ROAD 5.SRCX		Checked by AMF			
Micro Drainage		Source Control 2015.1			
<u>Summary of Results for 100 year Return Period (+40%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	0.134	0.134	2.5	36.4	Flood Risk
60 min Winter	0.164	0.164	2.5	45.1	Flood Risk
120 min Winter	0.186	0.186	2.5	51.5	Flood Risk
180 min Winter	0.190	0.190	2.5	52.8	Flood Risk
240 min Winter	0.188	0.188	2.5	52.1	Flood Risk
360 min Winter	0.180	0.180	2.5	50.0	Flood Risk
480 min Winter	0.170	0.170	2.5	47.0	Flood Risk
600 min Winter	0.158	0.158	2.5	43.6	Flood Risk
720 min Winter	0.146	0.146	2.5	40.0	Flood Risk
960 min Winter	0.122	0.122	2.5	33.0	Flood Risk
1440 min Winter	0.082	0.082	2.5	21.2	O K
2160 min Winter	0.049	0.049	2.5	11.5	O K
2880 min Winter	0.040	0.040	2.0	8.9	O K
4320 min Winter	0.029	0.029	1.5	5.9	O K
5760 min Winter	0.023	0.023	1.2	4.2	O K
7200 min Winter	0.020	0.020	1.0	3.0	O K
8640 min Winter	0.018	0.018	0.9	2.5	O K
10080 min Winter	0.017	0.017	0.8	2.2	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)		
30 min Winter	84.267	0.0	31		
60 min Winter	54.074	0.0	60		
120 min Winter	33.506	0.0	116		
180 min Winter	24.949	0.0	170		
240 min Winter	20.093	0.0	200		
360 min Winter	14.773	0.0	272		
480 min Winter	11.871	0.0	348		
600 min Winter	10.010	0.0	422		
720 min Winter	8.703	0.0	492		
960 min Winter	6.973	0.0	626		
1440 min Winter	5.093	0.0	866		
2160 min Winter	3.711	0.0	1164		
2880 min Winter	2.961	0.0	1524		
4320 min Winter	2.150	0.0	2248		
5760 min Winter	1.711	0.0	3000		
7200 min Winter	1.432	0.0	3672		
8640 min Winter	1.240	0.0	4248		
10080 min Winter	1.098	0.0	5120		
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19 - 21 Silvermills Court Henderson Place Lane Edinburgh EH3 5DG	Havant Road, Emsworth SUDs Drainage Permeable Road 5	
Date 01/03/2017 16:27 File PERMEABLE ROAD 5.SRCX	Designed by LK/AC Checked by AMF	
Micro Drainage		Source Control 2015.1

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.100	Shortest Storm (mins)	15
Ratio R	0.350	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

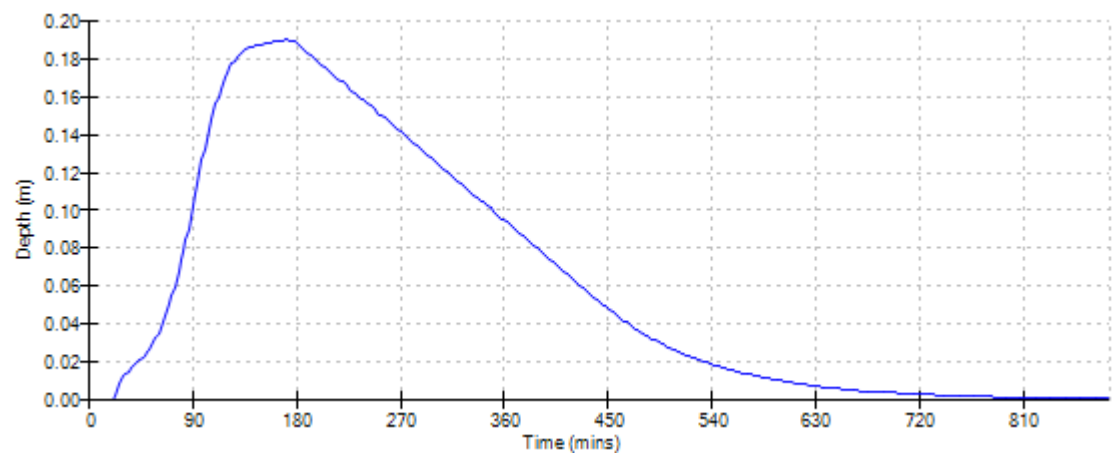
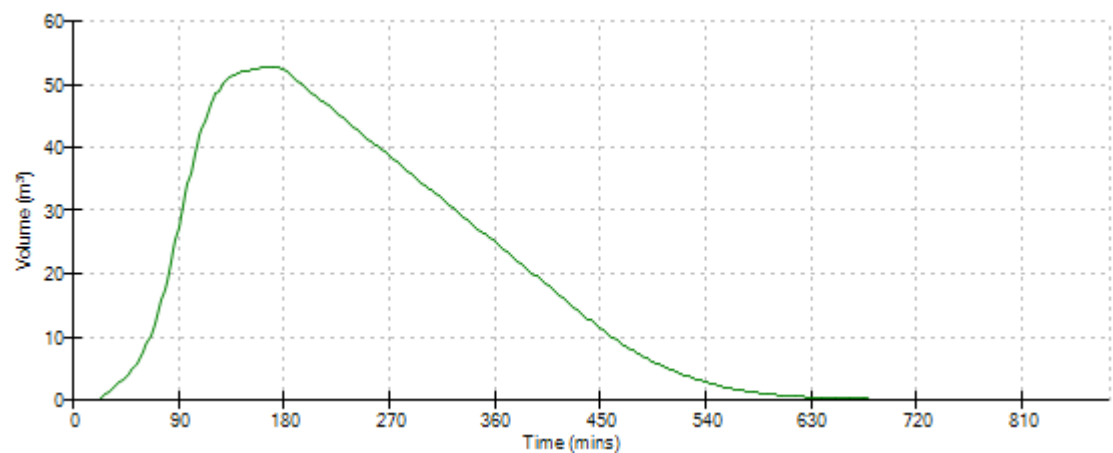
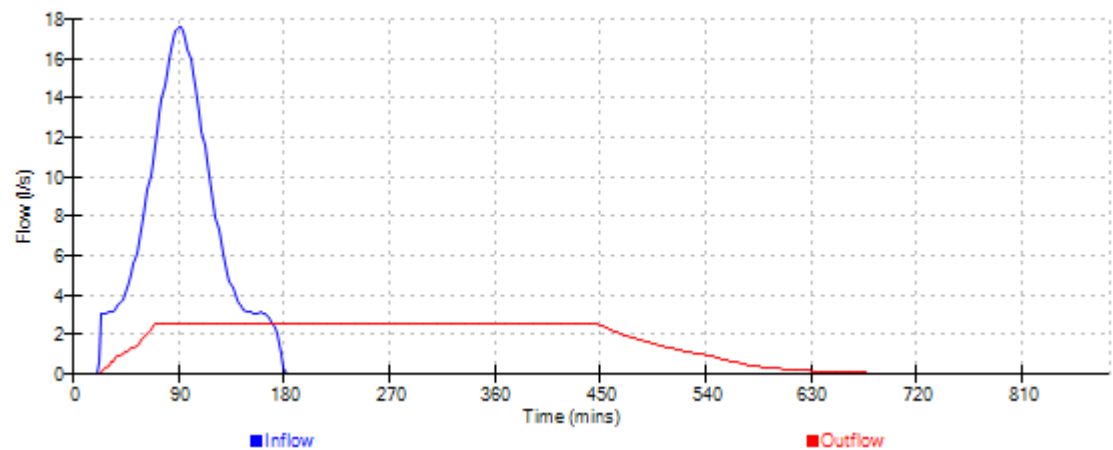
Time Area Diagram

Total Area (ha) 0.120

Time (mins)	Area	Time (mins)	Area
From:	To: (ha)	From:	To: (ha)
0	1 0.060	1	2 0.060

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19 - 21 Silvermills Court Henderson Place Lane Edinburgh EH3 5DG	Havant Road, Emsworth SUDs Drainage Permeable Road 5																									
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Micro Drainage Source Control 2015.1																										
<u>Model Details</u> Storage is Online Cover Level (m) 0.400 <u>Porous Car Park Structure</u> <table> <tr> <td>Infiltration Coefficient Base (m/hr)</td> <td>0.01872</td> <td>Width (m)</td> <td>5.3</td> </tr> <tr> <td>Membrane Percolation (mm/hr)</td> <td>500</td> <td>Length (m)</td> <td>183.6</td> </tr> <tr> <td>Max Percolation (l/s)</td> <td>135.2</td> <td>Slope (1:X)</td> <td>10000.0</td> </tr> <tr> <td>Safety Factor</td> <td>2.0</td> <td>Depression Storage (mm)</td> <td>3</td> </tr> <tr> <td>Porosity</td> <td>0.30</td> <td>Evaporation (mm/day)</td> <td>1</td> </tr> <tr> <td>Invert Level (m)</td> <td>0.000</td> <td>Cap Volume Depth (m)</td> <td>0.300</td> </tr> </table>			Infiltration Coefficient Base (m/hr)	0.01872	Width (m)	5.3	Membrane Percolation (mm/hr)	500	Length (m)	183.6	Max Percolation (l/s)	135.2	Slope (1:X)	10000.0	Safety Factor	2.0	Depression Storage (mm)	3	Porosity	0.30	Evaporation (mm/day)	1	Invert Level (m)	0.000	Cap Volume Depth (m)	0.300
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Event: 180 min Winter



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Summer</td><td>11.871</td><td>0.0</td><td>328</td></tr><tr><td>600 min Summer</td><td>10.010</td><td>0.0</td><td>396</td></tr><tr><td>720 min Summer</td><td>8.703</td><td>0.0</td><td>464</td></tr><tr><td>960 min Summer</td><td>6.973</td><td>0.0</td><td>598</td></tr><tr><td>1440 min Summer</td><td>5.093</td><td>0.0</td><td>852</td></tr><tr><td>2160 min Summer</td><td>3.711</td><td>0.0</td><td>1212</td></tr><tr><td>2880 min Summer</td><td>2.961</td><td>0.0</td><td>1532</td></tr><tr><td>4320 min Summer</td><td>2.150</td><td>0.0</td><td>2204</td></tr><tr><td>5760 min Summer</td><td>1.711</td><td>0.0</td><td>2936</td></tr><tr><td>7200 min Summer</td><td>1.432</td><td>0.0</td><td>3672</td></tr><tr><td>8640 min Summer</td><td>1.240</td><td>0.0</td><td>4400</td></tr><tr><td>10080 min Summer</td><td>1.098</td><td>0.0</td><td>5136</td></tr><tr><td>15 min Winter</td><td>125.353</td><td>0.0</td><td>18</td></tr></tbody></table>							Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status	15 min Summer	0.172	0.172	0.4	4.2	O K	30 min Summer	0.228	0.228	0.4	5.6	Flood Risk	60 min Summer	0.280	0.280	0.4	6.8	Flood Risk	120 min Summer	0.316	0.316	0.4	7.7	Flood Risk	180 min Summer	0.321	0.321	0.4	7.8	Flood Risk	240 min Summer	0.319	0.319	0.4	7.8	Flood Risk	360 min Summer	0.308	0.308	0.4	7.5	Flood Risk	480 min Summer	0.295	0.295	0.4	7.2	Flood Risk	600 min Summer	0.280	0.280	0.4	6.8	Flood Risk	720 min Summer	0.265	0.265	0.4	6.5	Flood Risk	960 min Summer	0.236	0.236	0.4	5.7	Flood Risk	1440 min Summer	0.181	0.181	0.4	4.4	Flood Risk	2160 min Summer	0.117	0.117	0.4	2.8	O K	2880 min Summer	0.074	0.074	0.4	1.8	O K	4320 min Summer	0.045	0.045	0.3	1.1	O K	5760 min Summer	0.037	0.037	0.3	0.9	O K	7200 min Summer	0.031	0.031	0.2	0.7	O K	8640 min Summer	0.027	0.027	0.2	0.6	O K	10080 min Summer	0.024	0.024	0.2	0.6	O K	15 min Winter	0.195	0.195	0.4	4.7	Flood Risk	Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)	15 min Summer	125.353	0.0	18	30 min Summer	84.267	0.0	33	60 min Summer	54.074	0.0	62	120 min Summer	33.506	0.0	120	180 min Summer	24.949	0.0	166	240 min Summer	20.093	0.0	196	360 min Summer	14.773	0.0	260	480 min Summer	11.871	0.0	328	600 min Summer	10.010	0.0	396	720 min Summer	8.703	0.0	464	960 min Summer	6.973	0.0	598	1440 min Summer	5.093	0.0	852	2160 min Summer	3.711	0.0	1212	2880 min Summer	2.961	0.0	1532	4320 min Summer	2.150	0.0	2204	5760 min Summer	1.711	0.0	2936	7200 min Summer	1.432	0.0	3672	8640 min Summer	1.240	0.0	4400	10080 min Summer	1.098	0.0	5136	15 min Winter	125.353	0.0	18
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Cundall, Johnston & Partners					Page 2	
19 - 21 Silvermills Court Henderson Place Lane Edinburgh EH3 5DG			Havant Road, Emsworth SUDs Drainage Permeable Road 6			
Date 28/02/2017 19:27 File PERMEABLE ROAD 6.SRCX			Designed by LK/AC Checked by AMF			
Micro Drainage			Source Control 2015.1			
Summary of Results for 100 year Return Period (+40%)						
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status	
30 min Winter	0.259	0.259	0.4	6.3	Flood Risk	
60 min Winter	0.319	0.319	0.4	7.8	Flood Risk	
120 min Winter	0.364	0.364	0.4	8.9	Flood Risk	
180 min Winter	0.375	0.375	0.4	9.2	Flood Risk	
240 min Winter	0.371	0.371	0.4	9.1	Flood Risk	
360 min Winter	0.355	0.355	0.4	8.7	Flood Risk	
480 min Winter	0.336	0.336	0.4	8.2	Flood Risk	
600 min Winter	0.314	0.314	0.4	7.7	Flood Risk	
720 min Winter	0.291	0.291	0.4	7.1	Flood Risk	
960 min Winter	0.245	0.245	0.4	6.0	Flood Risk	
1440 min Winter	0.161	0.161	0.4	3.9	O K	
2160 min Winter	0.073	0.073	0.4	1.8	O K	
2880 min Winter	0.046	0.046	0.3	1.1	O K	
4320 min Winter	0.033	0.033	0.2	0.8	O K	
5760 min Winter	0.027	0.027	0.2	0.6	O K	
7200 min Winter	0.022	0.022	0.2	0.5	O K	
8640 min Winter	0.019	0.019	0.1	0.4	O K	
10080 min Winter	0.017	0.017	0.1	0.4	O K	
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)			
30 min Winter	84.267	0.0	32			
60 min Winter	54.074	0.0	62			
120 min Winter	33.506	0.0	118			
180 min Winter	24.949	0.0	174			
240 min Winter	20.093	0.0	226			
360 min Winter	14.773	0.0	280			
480 min Winter	11.871	0.0	356			
600 min Winter	10.010	0.0	432			
720 min Winter	8.703	0.0	506			
960 min Winter	6.973	0.0	646			
1440 min Winter	5.093	0.0	898			
2160 min Winter	3.711	0.0	1216			
2880 min Winter	2.961	0.0	1496			
4320 min Winter	2.150	0.0	2208			
5760 min Winter	1.711	0.0	2936			
7200 min Winter	1.432	0.0	3672			
8640 min Winter	1.240	0.0	4408			
10080 min Winter	1.098	0.0	5112			
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19 - 21 Silvermills Court Henderson Place Lane Edinburgh EH3 5DG	Havant Road, Emsworth SUDs Drainage Permeable Road 6	
Date 28/02/2017 19:27 File PERMEABLE ROAD 6.SRCX	Designed by LK/AC Checked by AMF	
Micro Drainage		Source Control 2015.1

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.100	Shortest Storm (mins)	15
Ratio R	0.350	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

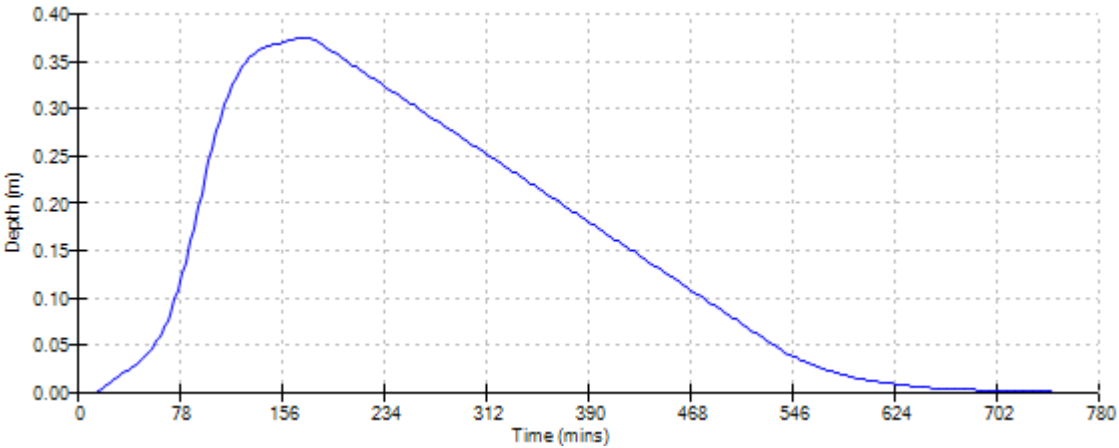
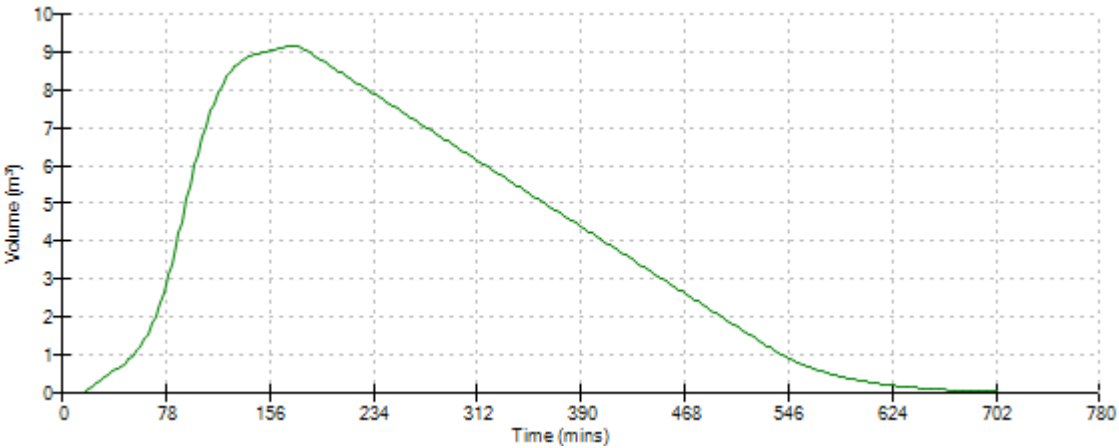
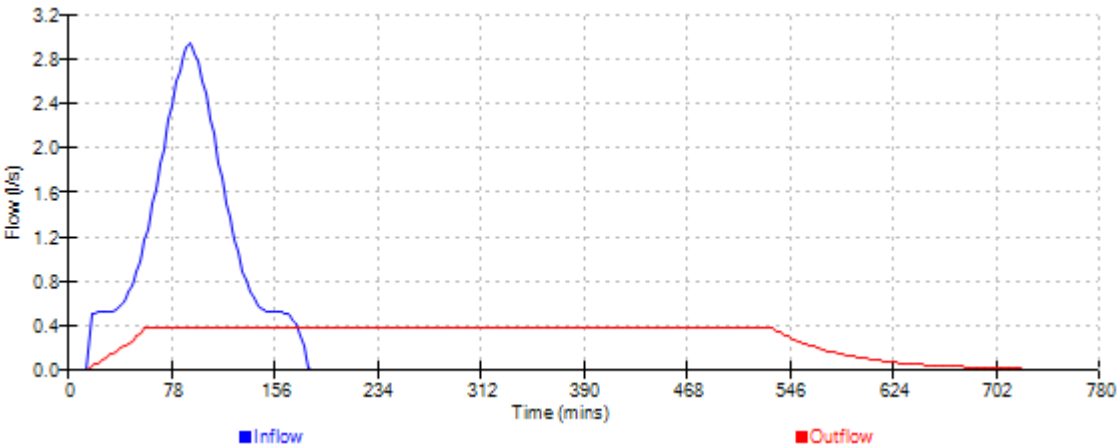
Time Area Diagram

Total Area (ha) 0.020

Time (mins)	Area	Time (mins)	Area
From:	To: (ha)	From:	To: (ha)
0	2 0.010	2	4 0.010

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19 - 21 Silvermills Court Henderson Place Lane Edinburgh EH3 5DG	Havant Road, Emsworth SUDs Drainage Permeable Road 6																									
Date 28/02/2017 19:27 File PERMEABLE ROAD 6.SRCX	Designed by LK/AC Checked by AMF																									
Micro Drainage Source Control 2015.1																										
<u>Model Details</u> Storage is Online Cover Level (m) 0.475 <u>Porous Car Park Structure</u> <table> <tr> <td>Infiltration Coefficient Base (m/hr)</td> <td>0.03312</td> <td>Width (m)</td> <td>4.0</td> </tr> <tr> <td>Membrane Percolation (mm/hr)</td> <td>500</td> <td>Length (m)</td> <td>20.4</td> </tr> <tr> <td>Max Percolation (l/s)</td> <td>11.3</td> <td>Slope (1:X)</td> <td>10000.0</td> </tr> <tr> <td>Safety Factor</td> <td>2.0</td> <td>Depression Storage (mm)</td> <td>3</td> </tr> <tr> <td>Porosity</td> <td>0.30</td> <td>Evaporation (mm/day)</td> <td>1</td> </tr> <tr> <td>Invert Level (m)</td> <td>0.000</td> <td>Cap Volume Depth (m)</td> <td>0.375</td> </tr> </table>			Infiltration Coefficient Base (m/hr)	0.03312	Width (m)	4.0	Membrane Percolation (mm/hr)	500	Length (m)	20.4	Max Percolation (l/s)	11.3	Slope (1:X)	10000.0	Safety Factor	2.0	Depression Storage (mm)	3	Porosity	0.30	Evaporation (mm/day)	1	Invert Level (m)	0.000	Cap Volume Depth (m)	0.375
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Event: 180 min Winter

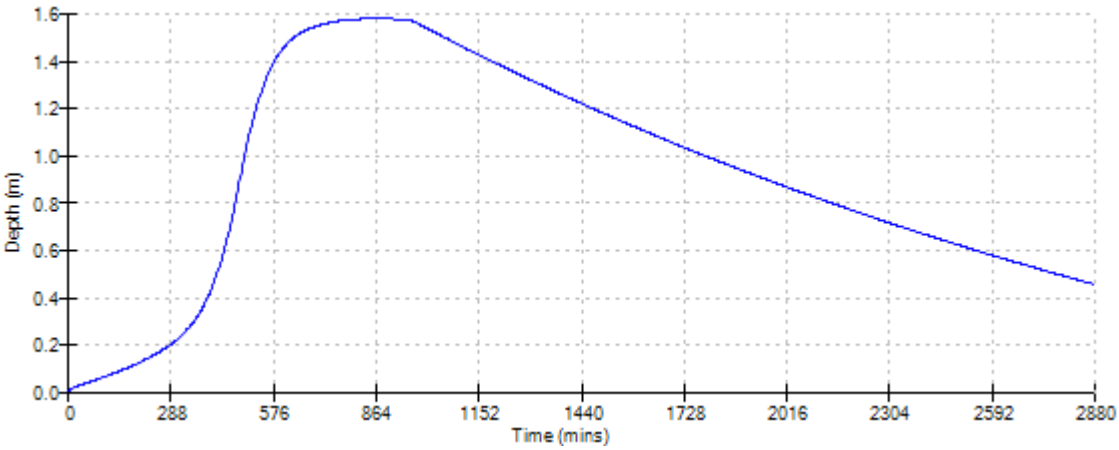
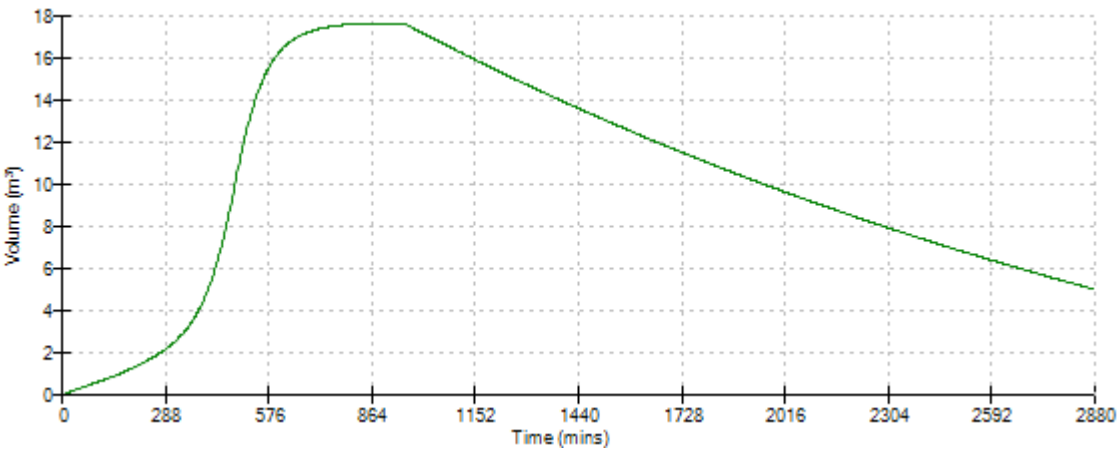
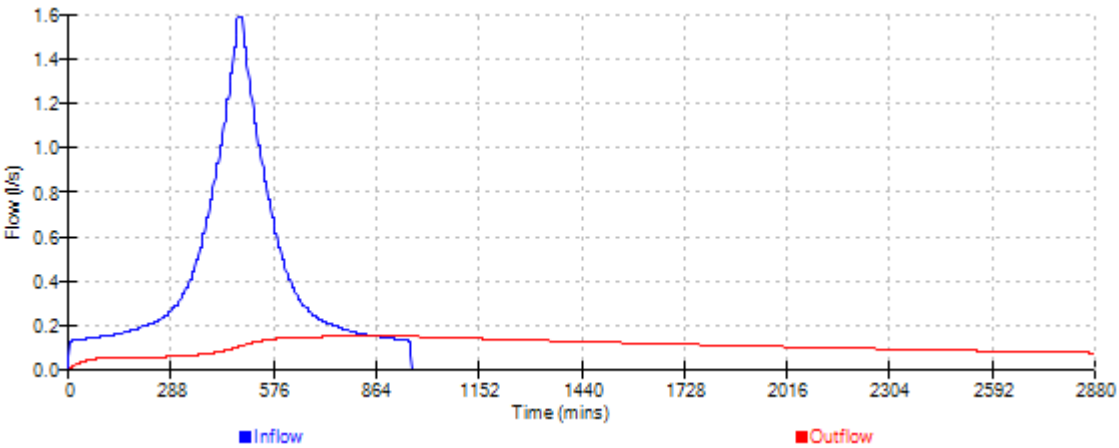


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<u>Summary of Results for 100 year Return Period (+40%)</u> Half Drain Time : 1323 minutes. <table><tr><th>Storm Event</th><th>Max Level (m)</th><th>Max Depth (m)</th><th>Max Infiltration (l/s)</th><th>Max Volume (m³)</th><th>Status</th></tr><tr><td>15 min Summer</td><td>0.591</td><td>0.591</td><td>0.1</td><td>6.5</td><td>O K</td></tr><tr><td>30 min Summer</td><td>0.787</td><td>0.787</td><td>0.1</td><td>8.7</td><td>O K</td></tr><tr><td>60 min Summer</td><td>0.996</td><td>0.996</td><td>0.1</td><td>11.1</td><td>O K</td></tr><tr><td>120 min Summer</td><td>1.208</td><td>1.208</td><td>0.1</td><td>13.4</td><td>O K</td></tr><tr><td>180 min Summer</td><td>1.323</td><td>1.323</td><td>0.1</td><td>14.7</td><td>O K</td></tr><tr><td>240 min Summer</td><td>1.394</td><td>1.394</td><td>0.1</td><td>15.5</td><td>O K</td></tr><tr><td>360 min Summer</td><td>1.483</td><td>1.483</td><td>0.1</td><td>16.5</td><td>O K</td></tr><tr><td>480 min Summer</td><td>1.534</td><td>1.534</td><td>0.1</td><td>17.1</td><td>O K</td></tr><tr><td>600 min Summer</td><td>1.562</td><td>1.562</td><td>0.1</td><td>17.4</td><td>O K</td></tr><tr><td>720 min Summer</td><td>1.576</td><td>1.576</td><td>0.2</td><td>17.6</td><td>O K</td></tr><tr><td>960 min Summer</td><td>1.580</td><td>1.580</td><td>0.2</td><td>17.6</td><td>O K</td></tr><tr><td>1440 min Summer</td><td>1.572</td><td>1.572</td><td>0.2</td><td>17.5</td><td>O K</td></tr><tr><td>2160 min Summer</td><td>1.535</td><td>1.535</td><td>0.1</td><td>17.1</td><td>O K</td></tr><tr><td>2880 min Summer</td><td>1.484</td><td>1.484</td><td>0.1</td><td>16.5</td><td>O K</td></tr><tr><td>4320 min Summer</td><td>1.372</td><td>1.372</td><td>0.1</td><td>15.3</td><td>O K</td></tr><tr><td>5760 min Summer</td><td>1.271</td><td>1.271</td><td>0.1</td><td>14.2</td><td>O K</td></tr><tr><td>7200 min Summer</td><td>1.182</td><td>1.182</td><td>0.1</td><td>13.2</td><td>O K</td></tr><tr><td>8640 min Summer</td><td>1.104</td><td>1.104</td><td>0.1</td><td>12.3</td><td>O K</td></tr><tr><td>10080 min Summer</td><td>1.034</td><td>1.034</td><td>0.1</td><td>11.5</td><td>O K</td></tr><tr><td>15 min Winter</td><td>0.661</td><td>0.661</td><td>0.1</td><td>7.3</td><td>O K</td></tr></table> <table><tr><th>Storm Event</th><th>Rain (mm/hr)</th><th>Flooded Volume (m³)</th><th>Time-Peak (mins)</th></tr><tr><td>15 min Summer</td><td>125.353</td><td>0.0</td><td>19</td></tr><tr><td>30 min Summer</td><td>84.267</td><td>0.0</td><td>34</td></tr><tr><td>60 min Summer</td><td>54.074</td><td>0.0</td><td>64</td></tr><tr><td>120 min Summer</td><td>33.506</td><td>0.0</td><td>124</td></tr><tr><td>180 min Summer</td><td>24.949</td><td>0.0</td><td>182</td></tr><tr><td>240 min Summer</td><td>20.093</td><td>0.0</td><td>242</td></tr><tr><td>360 min Summer</td><td>14.773</td><td>0.0</td><td>362</td></tr><tr><td>480 min Summer</td><td>11.871</td><td>0.0</td><td>482</td></tr><tr><td>600 min Summer</td><td>10.010</td><td>0.0</td><td>600</td></tr><tr><td>720 min Summer</td><td>8.703</td><td>0.0</td><td>720</td></tr><tr><td>960 min Summer</td><td>6.973</td><td>0.0</td><td>858</td></tr><tr><td>1440 min Summer</td><td>5.093</td><td>0.0</td><td>1110</td></tr><tr><td>2160 min Summer</td><td>3.711</td><td>0.0</td><td>1496</td></tr><tr><td>2880 min Summer</td><td>2.961</td><td>0.0</td><td>1928</td></tr><tr><td>4320 min Summer</td><td>2.150</td><td>0.0</td><td>2764</td></tr><tr><td>5760 min Summer</td><td>1.711</td><td>0.0</td><td>3576</td></tr><tr><td>7200 min Summer</td><td>1.432</td><td>0.0</td><td>4392</td></tr><tr><td>8640 min Summer</td><td>1.240</td><td>0.0</td><td>5184</td></tr><tr><td>10080 min Summer</td><td>1.098</td><td>0.0</td><td>5952</td></tr><tr><td>15 min Winter</td><td>125.353</td><td>0.0</td><td>19</td></tr></table>						Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status	15 min Summer	0.591	0.591	0.1	6.5	O K	30 min Summer	0.787	0.787	0.1	8.7	O K	60 min Summer	0.996	0.996	0.1	11.1	O K	120 min Summer	1.208	1.208	0.1	13.4	O K	180 min Summer	1.323	1.323	0.1	14.7	O K	240 min Summer	1.394	1.394	0.1	15.5	O K	360 min Summer	1.483	1.483	0.1	16.5	O K	480 min Summer	1.534	1.534	0.1	17.1	O K	600 min Summer	1.562	1.562	0.1	17.4	O K	720 min Summer	1.576	1.576	0.2	17.6	O K	960 min Summer	1.580	1.580	0.2	17.6	O K	1440 min Summer	1.572	1.572	0.2	17.5	O K	2160 min Summer	1.535	1.535	0.1	17.1	O K	2880 min Summer	1.484	1.484	0.1	16.5	O K	4320 min Summer	1.372	1.372	0.1	15.3	O K	5760 min Summer	1.271	1.271	0.1	14.2	O K	7200 min Summer	1.182	1.182	0.1	13.2	O K	8640 min Summer	1.104	1.104	0.1	12.3	O K	10080 min Summer	1.034	1.034	0.1	11.5	O K	15 min Winter	0.661	0.661	0.1	7.3	O K	Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)	15 min Summer	125.353	0.0	19	30 min Summer	84.267	0.0	34	60 min Summer	54.074	0.0	64	120 min Summer	33.506	0.0	124	180 min Summer	24.949	0.0	182	240 min Summer	20.093	0.0	242	360 min Summer	14.773	0.0	362	480 min Summer	11.871	0.0	482	600 min Summer	10.010	0.0	600	720 min Summer	8.703	0.0	720	960 min Summer	6.973	0.0	858	1440 min Summer	5.093	0.0	1110	2160 min Summer	3.711	0.0	1496	2880 min Summer	2.961	0.0	1928	4320 min Summer	2.150	0.0	2764	5760 min Summer	1.711	0.0	3576	7200 min Summer	1.432	0.0	4392	8640 min Summer	1.240	0.0	5184	10080 min Summer	1.098	0.0	5952	15 min Winter	125.353	0.0	19
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Cundall, Johnston & Partners				Page 2	
19 - 21 Silvermills Court Henderson Place Lane Edinburgh EH3 5DG		Havant Road, Emsworth SUDs Drainage Trench Soakaway [TSA] 1			
Date 28/02/2017 17:39 File TRENCH SA 1.SRCX		Designed by LK/AC Checked by AMF			
Micro Drainage		Source Control 2015.1			
<u>Summary of Results for 100 year Return Period (+40%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	0.881	0.881	0.1	9.8	O K
60 min Winter	1.116	1.116	0.1	12.4	O K
120 min Winter	1.356	1.356	0.1	15.1	O K
180 min Winter	1.487	1.487	0.1	16.6	O K
240 min Winter	1.569	1.569	0.2	17.5	O K
360 min Winter	1.674	1.674	0.2	18.7	O K
480 min Winter	1.740	1.740	0.2	19.4	Flood Risk
600 min Winter	1.781	1.781	0.2	19.9	Flood Risk
720 min Winter	1.805	1.805	0.2	20.2	Flood Risk
960 min Winter	1.934	1.934	0.2	20.4	Flood Risk
1440 min Winter	1.802	1.802	0.2	20.1	Flood Risk
2160 min Winter	1.750	1.750	0.2	19.5	Flood Risk
2880 min Winter	1.674	1.674	0.2	18.7	O K
4320 min Winter	1.513	1.513	0.1	16.9	O K
5760 min Winter	1.365	1.365	0.1	15.2	O K
7200 min Winter	1.239	1.239	0.1	13.8	O K
8640 min Winter	1.130	1.130	0.1	12.6	O K
10080 min Winter	1.033	1.033	0.1	11.5	O K
Storm Event	Rain (mm/hr)		Flooded Volume (m³)	Time-Peak (mins)	
30 min Winter	84.267		0.0	33	
60 min Winter	54.074		0.0	64	
120 min Winter	33.506		0.0	122	
180 min Winter	24.949		0.0	180	
240 min Winter	20.093		0.0	238	
360 min Winter	14.773		0.0	356	
480 min Winter	11.871		0.0	470	
600 min Winter	10.010		0.0	584	
720 min Winter	8.703		0.0	698	
960 min Winter	6.973		0.0	914	
1440 min Winter	5.093		0.0	1180	
2160 min Winter	3.711		0.0	1620	
2880 min Winter	2.961		0.0	2076	
4320 min Winter	2.150		0.0	2944	
5760 min Winter	1.711		0.0	3808	
7200 min Winter	1.432		0.0	4680	
8640 min Winter	1.240		0.0	5456	
10080 min Winter	1.098		0.0	6256	
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19 - 21 Silvermills Court Henderson Place Lane Edinburgh EH3 5DG	Havant Road, Emsworth SUDs Drainage Trench Soakaway [TSA] 1																					
Date 28/02/2017 17:39 File TRENCH SA 1.SRCX	Designed by LK/AC Checked by AMF																					
Micro Drainage Source Control 2015.1																						
<u>Model Details</u> Storage is Online Cover Level (m) 2.000 <u>Trench Soakaway Structure</u> <table> <tr> <td>Infiltration Coefficient Base (m/hr)</td> <td>0.00900</td> <td>Trench Width (m)</td> <td>1.5</td> </tr> <tr> <td>Infiltration Coefficient Side (m/hr)</td> <td>0.00900</td> <td>Trench Length (m)</td> <td>25.0</td> </tr> <tr> <td>Safety Factor</td> <td>2.0</td> <td>Slope (1:X)</td> <td>1000.0</td> </tr> <tr> <td>Porosity</td> <td>0.30</td> <td>Cap Volume Depth (m)</td> <td>1.800</td> </tr> <tr> <td>Invert Level (m)</td> <td>0.000</td> <td>Cap Infiltration Depth (m)</td> <td>1.600</td> </tr> </table>			Infiltration Coefficient Base (m/hr)	0.00900	Trench Width (m)	1.5	Infiltration Coefficient Side (m/hr)	0.00900	Trench Length (m)	25.0	Safety Factor	2.0	Slope (1:X)	1000.0	Porosity	0.30	Cap Volume Depth (m)	1.800	Invert Level (m)	0.000	Cap Infiltration Depth (m)	1.600
Infiltration Coefficient Base (m/hr)	0.00900	Trench Width (m)	1.5																			
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Event: 960 min Summer



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Date 01/03/2017 10:15 File TRENCH SA 2.SRCX		Designed by LK/AC Checked by AMF																																																																																																																																																																																																																					
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<u>Summary of Results for 100 year Return Period (+40%)</u> Half Drain Time : 104 minutes. <table><tr><th>Storm Event</th><th>Max Level (m)</th><th>Max Depth (m)</th><th>Max Infiltration (l/s)</th><th>Max Volume (m³)</th><th>Status</th></tr><tr><td>15 min Summer</td><td>1.026</td><td>1.026</td><td>0.9</td><td>6.6</td><td>O K</td></tr><tr><td>30 min Summer</td><td>1.307</td><td>1.307</td><td>1.0</td><td>8.4</td><td>O K</td></tr><tr><td>60 min Summer</td><td>1.510</td><td>1.510</td><td>1.1</td><td>9.8</td><td>O K</td></tr><tr><td>120 min Summer</td><td>1.590</td><td>1.590</td><td>1.2</td><td>10.3</td><td>O K</td></tr><tr><td>180 min Summer</td><td>1.577</td><td>1.577</td><td>1.1</td><td>10.2</td><td>O K</td></tr><tr><td>240 min Summer</td><td>1.528</td><td>1.528</td><td>1.1</td><td>9.9</td><td>O K</td></tr><tr><td>360 min Summer</td><td>1.421</td><td>1.421</td><td>1.1</td><td>9.2</td><td>O K</td></tr><tr><td>480 min Summer</td><td>1.323</td><td>1.323</td><td>1.0</td><td>8.5</td><td>O K</td></tr><tr><td>600 min Summer</td><td>1.233</td><td>1.233</td><td>1.0</td><td>8.0</td><td>O K</td></tr><tr><td>720 min Summer</td><td>1.149</td><td>1.149</td><td>1.0</td><td>7.4</td><td>O K</td></tr><tr><td>960 min Summer</td><td>1.001</td><td>1.001</td><td>0.9</td><td>6.5</td><td>O K</td></tr><tr><td>1440 min Summer</td><td>0.765</td><td>0.765</td><td>0.8</td><td>4.9</td><td>O K</td></tr><tr><td>2160 min Summer</td><td>0.513</td><td>0.513</td><td>0.7</td><td>3.3</td><td>O K</td></tr><tr><td>2880 min Summer</td><td>0.339</td><td>0.339</td><td>0.6</td><td>2.2</td><td>O K</td></tr><tr><td>4320 min Summer</td><td>0.127</td><td>0.127</td><td>0.5</td><td>0.8</td><td>O K</td></tr><tr><td>5760 min Summer</td><td>0.048</td><td>0.048</td><td>0.4</td><td>0.3</td><td>O K</td></tr><tr><td>7200 min Summer</td><td>0.040</td><td>0.040</td><td>0.4</td><td>0.2</td><td>O K</td></tr><tr><td>8640 min Summer</td><td>0.035</td><td>0.035</td><td>0.3</td><td>0.2</td><td>O K</td></tr><tr><td>10080 min Summer</td><td>0.031</td><td>0.031</td><td>0.3</td><td>0.2</td><td>O K</td></tr><tr><td>15 min Winter</td><td>1.157</td><td>1.157</td><td>1.0</td><td>7.5</td><td>O K</td></tr></table> <table><tr><th>Storm Event</th><th>Rain (mm/hr)</th><th>Flooded Volume (m³)</th><th>Time-Peak (mins)</th></tr><tr><td>15 min Summer</td><td>125.353</td><td>0.0</td><td>18</td></tr><tr><td>30 min Summer</td><td>84.267</td><td>0.0</td><td>32</td></tr><tr><td>60 min Summer</td><td>54.074</td><td>0.0</td><td>60</td></tr><tr><td>120 min Summer</td><td>33.506</td><td>0.0</td><td>92</td></tr><tr><td>180 min Summer</td><td>24.949</td><td>0.0</td><td>126</td></tr><tr><td>240 min Summer</td><td>20.093</td><td>0.0</td><td>160</td></tr><tr><td>360 min Summer</td><td>14.773</td><td>0.0</td><td>230</td></tr><tr><td>480 min Summer</td><td>11.871</td><td>0.0</td><td>298</td></tr><tr><td>600 min Summer</td><td>10.010</td><td>0.0</td><td>364</td></tr><tr><td>720 min Summer</td><td>8.703</td><td>0.0</td><td>432</td></tr><tr><td>960 min Summer</td><td>6.973</td><td>0.0</td><td>558</td></tr><tr><td>1440 min Summer</td><td>5.093</td><td>0.0</td><td>808</td></tr><tr><td>2160 min Summer</td><td>3.711</td><td>0.0</td><td>1172</td></tr><tr><td>2880 min Summer</td><td>2.961</td><td>0.0</td><td>1532</td></tr><tr><td>4320 min Summer</td><td>2.150</td><td>0.0</td><td>2248</td></tr><tr><td>5760 min Summer</td><td>1.711</td><td>0.0</td><td>2920</td></tr><tr><td>7200 min Summer</td><td>1.432</td><td>0.0</td><td>3672</td></tr><tr><td>8640 min Summer</td><td>1.240</td><td>0.0</td><td>4392</td></tr><tr><td>10080 min Summer</td><td>1.098</td><td>0.0</td><td>5136</td></tr><tr><td>15 min Winter</td><td>125.353</td><td>0.0</td><td>18</td></tr></table>						Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status	15 min Summer	1.026	1.026	0.9	6.6	O K	30 min Summer	1.307	1.307	1.0	8.4	O K	60 min Summer	1.510	1.510	1.1	9.8	O K	120 min Summer	1.590	1.590	1.2	10.3	O K	180 min Summer	1.577	1.577	1.1	10.2	O K	240 min Summer	1.528	1.528	1.1	9.9	O K	360 min Summer	1.421	1.421	1.1	9.2	O K	480 min Summer	1.323	1.323	1.0	8.5	O K	600 min Summer	1.233	1.233	1.0	8.0	O K	720 min Summer	1.149	1.149	1.0	7.4	O K	960 min Summer	1.001	1.001	0.9	6.5	O K	1440 min Summer	0.765	0.765	0.8	4.9	O K	2160 min Summer	0.513	0.513	0.7	3.3	O K	2880 min Summer	0.339	0.339	0.6	2.2	O K	4320 min Summer	0.127	0.127	0.5	0.8	O K	5760 min Summer	0.048	0.048	0.4	0.3	O K	7200 min Summer	0.040	0.040	0.4	0.2	O K	8640 min Summer	0.035	0.035	0.3	0.2	O K	10080 min Summer	0.031	0.031	0.3	0.2	O K	15 min Winter	1.157	1.157	1.0	7.5	O K	Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)	15 min Summer	125.353	0.0	18	30 min Summer	84.267	0.0	32	60 min Summer	54.074	0.0	60	120 min Summer	33.506	0.0	92	180 min Summer	24.949	0.0	126	240 min Summer	20.093	0.0	160	360 min Summer	14.773	0.0	230	480 min Summer	11.871	0.0	298	600 min Summer	10.010	0.0	364	720 min Summer	8.703	0.0	432	960 min Summer	6.973	0.0	558	1440 min Summer	5.093	0.0	808	2160 min Summer	3.711	0.0	1172	2880 min Summer	2.961	0.0	1532	4320 min Summer	2.150	0.0	2248	5760 min Summer	1.711	0.0	2920	7200 min Summer	1.432	0.0	3672	8640 min Summer	1.240	0.0	4392	10080 min Summer	1.098	0.0	5136	15 min Winter	125.353	0.0	18
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Cundall, Johnston & Partners					Page 2	
19 - 21 Silvermills Court Henderson Place Lane Edinburgh EH3 5DG			Havant Road, Emsworth SUDs Drainage Trench Soakaway [TSA] 1			
Date 01/03/2017 10:15 File TRENCH SA 2.SRCX			Designed by LK/AC Checked by AMF			
Micro Drainage			Source Control 2015.1			
Summary of Results for 100 year Return Period (+40%)						
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status	
30 min Winter	1.481	1.481	1.1	9.6	O K	
60 min Winter	1.733	1.733	1.2	11.2	Flood Risk	
120 min Winter	1.978	1.978	1.2	11.8	Flood Risk	
180 min Winter	1.827	1.827	1.2	11.7	Flood Risk	
240 min Winter	1.733	1.733	1.2	11.2	Flood Risk	
360 min Winter	1.561	1.561	1.1	10.1	O K	
480 min Winter	1.414	1.414	1.1	9.1	O K	
600 min Winter	1.282	1.282	1.0	8.3	O K	
720 min Winter	1.163	1.163	1.0	7.5	O K	
960 min Winter	0.959	0.959	0.9	6.2	O K	
1440 min Winter	0.652	0.652	0.7	4.2	O K	
2160 min Winter	0.351	0.351	0.6	2.2	O K	
2880 min Winter	0.159	0.159	0.5	1.0	O K	
4320 min Winter	0.044	0.044	0.4	0.3	O K	
5760 min Winter	0.035	0.035	0.3	0.2	O K	
7200 min Winter	0.029	0.029	0.3	0.2	O K	
8640 min Winter	0.025	0.025	0.2	0.1	O K	
10080 min Winter	0.023	0.023	0.2	0.1	O K	
Storm Event	Rain (mm/hr)		Flooded Volume (m³)	Time-Peak (mins)		
30 min Winter	84.267		0.0	31		
60 min Winter	54.074		0.0	60		
120 min Winter	33.506		0.0	98		
180 min Winter	24.949		0.0	136		
240 min Winter	20.093		0.0	174		
360 min Winter	14.773		0.0	246		
480 min Winter	11.871		0.0	318		
600 min Winter	10.010		0.0	388		
720 min Winter	8.703		0.0	456		
960 min Winter	6.973		0.0	588		
1440 min Winter	5.093		0.0	848		
2160 min Winter	3.711		0.0	1212		
2880 min Winter	2.961		0.0	1560		
4320 min Winter	2.150		0.0	2168		
5760 min Winter	1.711		0.0	2872		
7200 min Winter	1.432		0.0	3584		
8640 min Winter	1.240		0.0	4272		
10080 min Winter	1.098		0.0	5128		
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19 - 21 Silvermills Court Henderson Place Lane Edinburgh EH3 5DG	Havant Road, Emsworth SUDs Drainage Trench Soakaway [TSA] 1	
Date 01/03/2017 10:15 File TRENCH SA 2.SRCX	Designed by LK/AC Checked by AMF	
Micro Drainage	Source Control 2015.1	

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.100	Shortest Storm (mins)	15
Ratio R	0.350	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

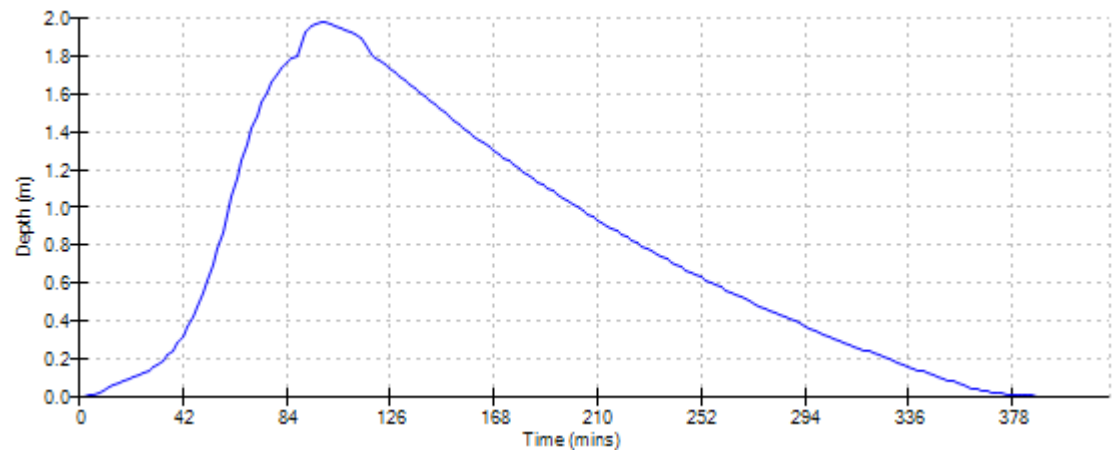
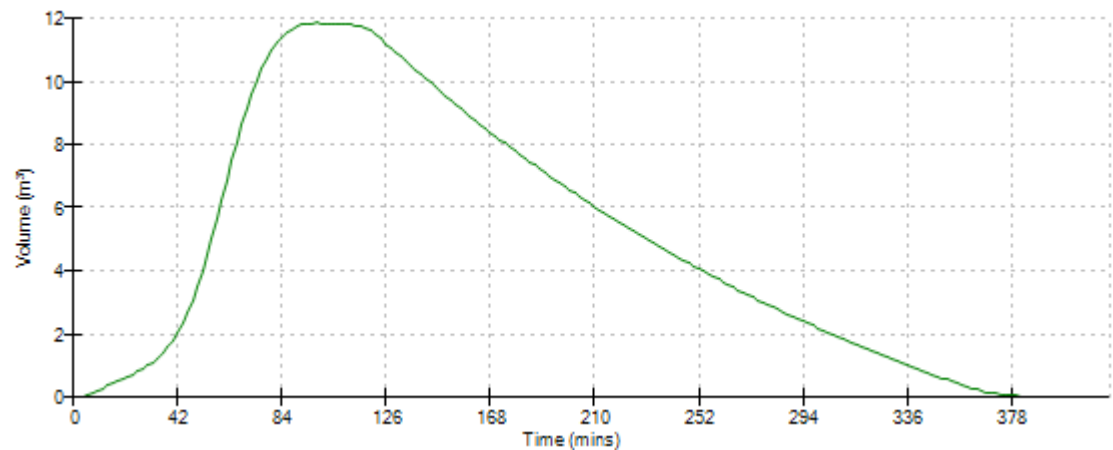
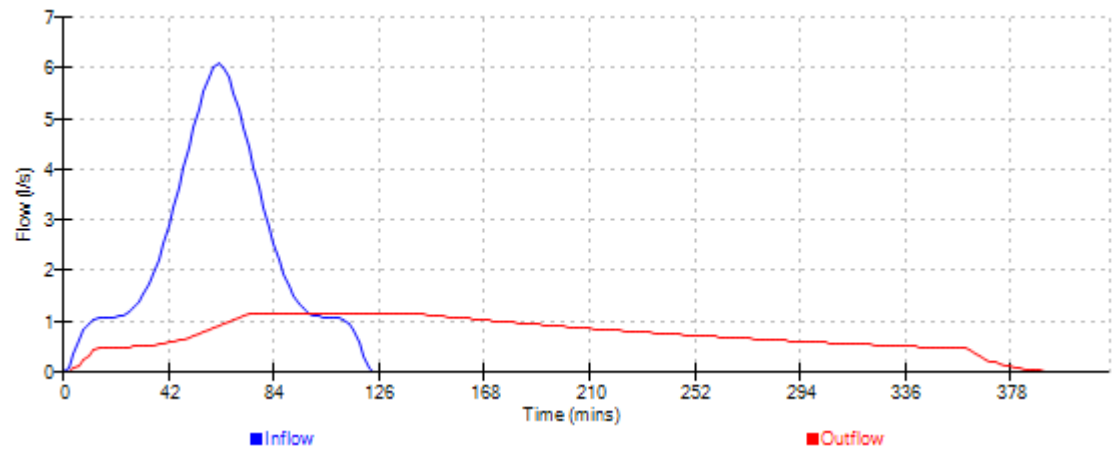
Time Area Diagram

Total Area (ha) 0.031

Time (mins)	Area	Time (mins)	Area
From: To: (ha)		From: To: (ha)	
0 2	0.016	2 4	0.015

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19 - 21 Silvermills Court Henderson Place Lane Edinburgh EH3 5DG	Havant Road, Emsworth SUDs Drainage Trench Soakaway [TSA] 1																					
Date 01/03/2017 10:15 File TRENCH SA 2.SRCX	Designed by LK/AC Checked by AMF																					
Micro Drainage Source Control 2015.1																						
<u>Model Details</u> Storage is Online Cover Level (m) 2.000 <u>Trench Soakaway Structure</u> <table> <tr> <td>Infiltration Coefficient Base (m/hr)</td> <td>0.14400</td> <td>Trench Width (m)</td> <td>2.4</td> </tr> <tr> <td>Infiltration Coefficient Side (m/hr)</td> <td>0.14400</td> <td>Trench Length (m)</td> <td>9.0</td> </tr> <tr> <td>Safety Factor</td> <td>2.0</td> <td>Slope (1:X)</td> <td>1000.0</td> </tr> <tr> <td>Porosity</td> <td>0.30</td> <td>Cap Volume Depth (m)</td> <td>1.800</td> </tr> <tr> <td>Invert Level (m)</td> <td>0.000</td> <td>Cap Infiltration Depth (m)</td> <td>1.600</td> </tr> </table>			Infiltration Coefficient Base (m/hr)	0.14400	Trench Width (m)	2.4	Infiltration Coefficient Side (m/hr)	0.14400	Trench Length (m)	9.0	Safety Factor	2.0	Slope (1:X)	1000.0	Porosity	0.30	Cap Volume Depth (m)	1.800	Invert Level (m)	0.000	Cap Infiltration Depth (m)	1.600
Infiltration Coefficient Base (m/hr)	0.14400	Trench Width (m)	2.4																			
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Porosity	0.30	Cap Volume Depth (m)	1.800																			
Invert Level (m)	0.000	Cap Infiltration Depth (m)	1.600																			
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Event: 120 min Winter

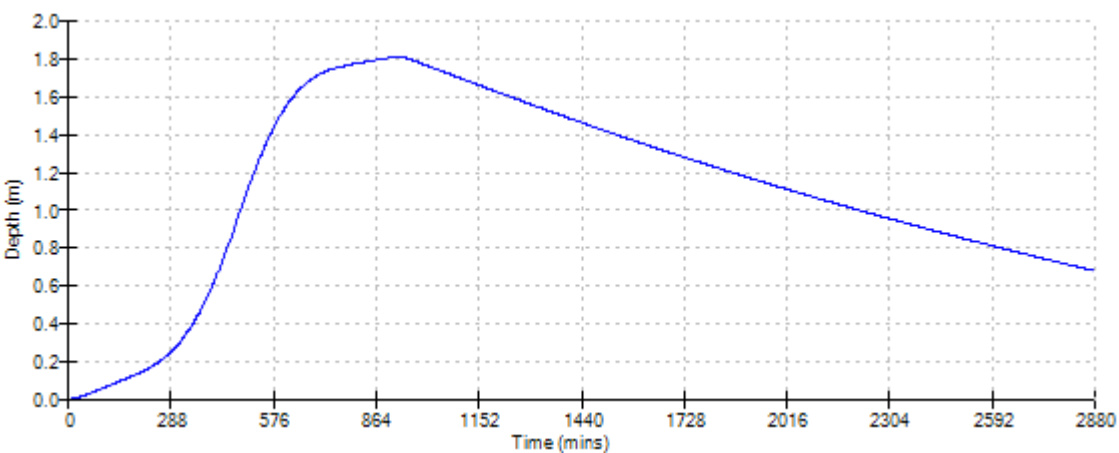
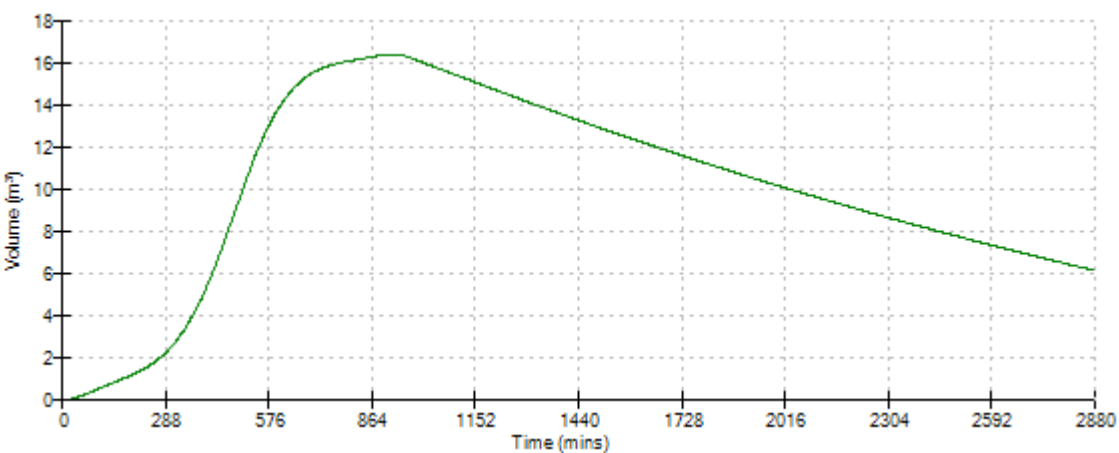
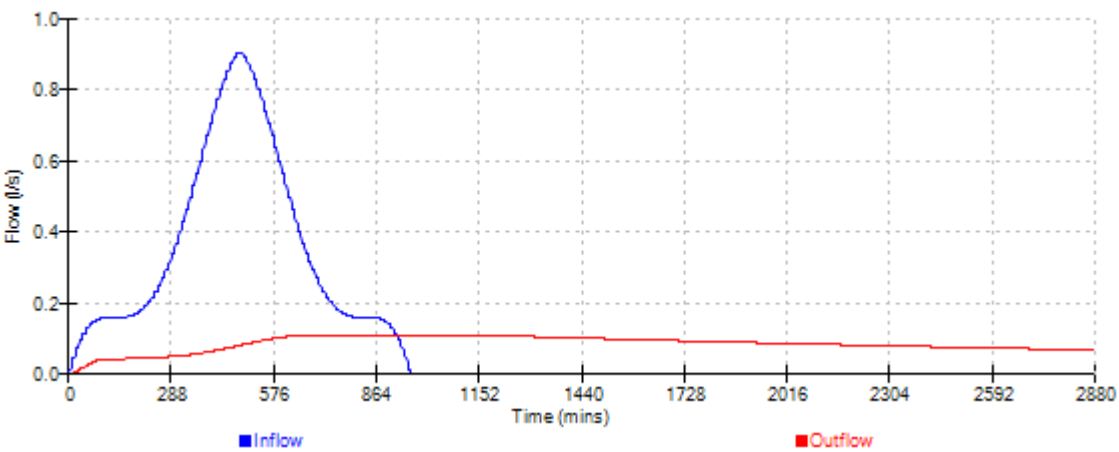


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<u>Summary of Results for 100 year Return Period (+40%)</u> Half Drain Time : 1498 minutes. <table><thead><tr><th>Storm Event</th><th>Max Level (m)</th><th>Max Depth (m)</th><th>Max Infiltration (l/s)</th><th>Max Volume (m³)</th><th>Status</th></tr></thead><tbody><tr><td>15 min Summer</td><td>0.569</td><td>0.569</td><td>0.1</td><td>5.1</td><td>O K</td></tr><tr><td>30 min Summer</td><td>0.759</td><td>0.759</td><td>0.1</td><td>6.9</td><td>O K</td></tr><tr><td>60 min Summer</td><td>0.963</td><td>0.963</td><td>0.1</td><td>8.7</td><td>O K</td></tr><tr><td>120 min Summer</td><td>1.170</td><td>1.170</td><td>0.1</td><td>10.6</td><td>O K</td></tr><tr><td>180 min Summer</td><td>1.284</td><td>1.284</td><td>0.1</td><td>11.6</td><td>O K</td></tr><tr><td>240 min Summer</td><td>1.357</td><td>1.357</td><td>0.1</td><td>12.3</td><td>O K</td></tr><tr><td>360 min Summer</td><td>1.449</td><td>1.449</td><td>0.1</td><td>13.1</td><td>O K</td></tr><tr><td>480 min Summer</td><td>1.504</td><td>1.504</td><td>0.1</td><td>13.7</td><td>O K</td></tr><tr><td>600 min Summer</td><td>1.538</td><td>1.538</td><td>0.1</td><td>14.0</td><td>O K</td></tr><tr><td>720 min Summer</td><td>1.557</td><td>1.557</td><td>0.1</td><td>14.1</td><td>O K</td></tr><tr><td>960 min Summer</td><td>1.568</td><td>1.568</td><td>0.1</td><td>14.2</td><td>O K</td></tr><tr><td>1440 min Summer</td><td>1.560</td><td>1.560</td><td>0.1</td><td>14.2</td><td>O K</td></tr><tr><td>2160 min Summer</td><td>1.528</td><td>1.528</td><td>0.1</td><td>13.9</td><td>O K</td></tr><tr><td>2880 min Summer</td><td>1.482</td><td>1.482</td><td>0.1</td><td>13.4</td><td>O K</td></tr><tr><td>4320 min Summer</td><td>1.378</td><td>1.378</td><td>0.1</td><td>12.5</td><td>O K</td></tr><tr><td>5760 min Summer</td><td>1.284</td><td>1.284</td><td>0.1</td><td>11.6</td><td>O K</td></tr><tr><td>7200 min Summer</td><td>1.199</td><td>1.199</td><td>0.1</td><td>10.9</td><td>O K</td></tr><tr><td>8640 min 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Summer	0.759	0.759	0.1	6.9	O K	60 min Summer	0.963	0.963	0.1	8.7	O K	120 min Summer	1.170	1.170	0.1	10.6	O K	180 min Summer	1.284	1.284	0.1	11.6	O K	240 min Summer	1.357	1.357	0.1	12.3	O K	360 min Summer	1.449	1.449	0.1	13.1	O K	480 min Summer	1.504	1.504	0.1	13.7	O K	600 min Summer	1.538	1.538	0.1	14.0	O K	720 min Summer	1.557	1.557	0.1	14.1	O K	960 min Summer	1.568	1.568	0.1	14.2	O K	1440 min Summer	1.560	1.560	0.1	14.2	O K	2160 min Summer	1.528	1.528	0.1	13.9	O K	2880 min Summer	1.482	1.482	0.1	13.4	O K	4320 min Summer	1.378	1.378	0.1	12.5	O K	5760 min Summer	1.284	1.284	0.1	11.6	O K	7200 min Summer	1.199	1.199	0.1	10.9	O K	8640 min Summer	1.124	1.124	0.1	10.2	O K	10080 min Summer	1.056	1.056	0.1	9.6	O K	15 min Winter	0.637	0.637	0.1	5.7	O K	Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)	15 min Summer	125.353	0.0	19	30 min Summer	84.267	0.0	34	60 min Summer	54.074	0.0	64	120 min Summer	33.506	0.0	124	180 min Summer	24.949	0.0	182	240 min Summer	20.093	0.0	242	360 min Summer	14.773	0.0	362	480 min Summer	11.871	0.0	482	600 min Summer	10.010	0.0	602	720 min Summer	8.703	0.0	720	960 min Summer	6.973	0.0	950	1440 min Summer	5.093	0.0	1166	2160 min Summer	3.711	0.0	1552	2880 min Summer	2.961	0.0	1960	4320 min Summer	2.150	0.0	2808	5760 min Summer	1.711	0.0	3632	7200 min Summer	1.432	0.0	4464	8640 min Summer	1.240	0.0	5264	10080 min Summer	1.098	0.0	6048	15 min Winter	125.353	0.0	19
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19 - 21 Silvermills Court Henderson Place Lane Edinburgh EH3 5DG			Havant Road, Emsworth SUDS Sizing Trench Soakaway [TSA] 3			
Date 13/07/16 File TRENCH SA 3.SRCX			Designed by LK Checked by AMF			
Micro Drainage			Source Control 2015.1			
Summary of Results for 100 year Return Period (+40%)						
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status	
30 min Winter	0.850	0.850	0.1	7.7	O K	
60 min Winter	1.079	1.079	0.1	9.8	O K	
120 min Winter	1.314	1.314	0.1	11.9	O K	
180 min Winter	1.445	1.445	0.1	13.1	O K	
240 min Winter	1.528	1.528	0.1	13.9	O K	
360 min Winter	1.636	1.636	0.1	14.8	O K	
480 min Winter	1.704	1.704	0.1	15.5	Flood Risk	
600 min Winter	1.750	1.750	0.1	15.9	Flood Risk	
720 min Winter	1.779	1.779	0.1	16.2	Flood Risk	
960 min Winter	1.811	1.811	0.1	16.4	Flood Risk	
1440 min Winter	1.800	1.800	0.1	16.3	Flood Risk	
2160 min Winter	1.752	1.752	0.1	15.9	Flood Risk	
2880 min Winter	1.687	1.687	0.1	15.3	O K	
4320 min Winter	1.540	1.540	0.1	14.0	O K	
5760 min Winter	1.400	1.400	0.1	12.7	O K	
7200 min Winter	1.279	1.279	0.1	11.6	O K	
8640 min Winter	1.172	1.172	0.1	10.6	O K	
10080 min Winter	1.076	1.076	0.1	9.7	O K	
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)			
30 min Winter	84.267	0.0	34			
60 min Winter	54.074	0.0	64			
120 min Winter	33.506	0.0	122			
180 min Winter	24.949	0.0	180			
240 min Winter	20.093	0.0	240			
360 min Winter	14.773	0.0	356			
480 min Winter	11.871	0.0	472			
600 min Winter	10.010	0.0	586			
720 min Winter	8.703	0.0	700			
960 min Winter	6.973	0.0	924			
1440 min Winter	5.093	0.0	1340			
2160 min Winter	3.711	0.0	1664			
2880 min Winter	2.961	0.0	2108			
4320 min Winter	2.150	0.0	3024			
5760 min Winter	1.711	0.0	3872			
7200 min Winter	1.432	0.0	4752			
8640 min Winter	1.240	0.0	5616			
10080 min Winter	1.098	0.0	6360			
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19 - 21 Silvermills Court Henderson Place Lane Edinburgh EH3 5DG	Havant Road, Emsworth SUDS Sizing Trench Soakaway [TSA] 3																					
Date 13/07/16 File TRENCH SA 3.SRCX	Designed by LK Checked by AMF																					
Micro Drainage Source Control 2015.1																						
<u>Model Details</u> Storage is Online Cover Level (m) 2.000 <u>Trench Soakaway Structure</u> <table> <tr> <td>Infiltration Coefficient Base (m/hr)</td> <td>0.00900</td> <td>Trench Width (m)</td> <td>2.0</td> </tr> <tr> <td>Infiltration Coefficient Side (m/hr)</td> <td>0.00900</td> <td>Trench Length (m)</td> <td>15.2</td> </tr> <tr> <td>Safety Factor</td> <td>2.0</td> <td>Slope (1:X)</td> <td>1000.0</td> </tr> <tr> <td>Porosity</td> <td>0.30</td> <td>Cap Volume Depth (m)</td> <td>1.800</td> </tr> <tr> <td>Invert Level (m)</td> <td>0.000</td> <td>Cap Infiltration Depth (m)</td> <td>1.600</td> </tr> </table>			Infiltration Coefficient Base (m/hr)	0.00900	Trench Width (m)	2.0	Infiltration Coefficient Side (m/hr)	0.00900	Trench Length (m)	15.2	Safety Factor	2.0	Slope (1:X)	1000.0	Porosity	0.30	Cap Volume Depth (m)	1.800	Invert Level (m)	0.000	Cap Infiltration Depth (m)	1.600
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Event: 960 min Winter



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<u>Summary of Results for 100 year Return Period (+40%)</u> Half Drain Time : 1385 minutes. <table><tr><th>Storm Event</th><th>Max Level (m)</th><th>Max Depth (m)</th><th>Max Infiltration (l/s)</th><th>Max Volume (m³)</th><th>Status</th></tr><tr><td>15 min Summer</td><td>0.576</td><td>0.576</td><td>0.1</td><td>5.4</td><td>O K</td></tr><tr><td>30 min Summer</td><td>0.768</td><td>0.768</td><td>0.1</td><td>7.2</td><td>O K</td></tr><tr><td>60 min Summer</td><td>0.973</td><td>0.973</td><td>0.1</td><td>9.1</td><td>O K</td></tr><tr><td>120 min Summer</td><td>1.182</td><td>1.182</td><td>0.1</td><td>11.1</td><td>O K</td></tr><tr><td>180 min Summer</td><td>1.295</td><td>1.295</td><td>0.1</td><td>12.1</td><td>O K</td></tr><tr><td>240 min Summer</td><td>1.367</td><td>1.367</td><td>0.1</td><td>12.8</td><td>O K</td></tr><tr><td>360 min Summer</td><td>1.456</td><td>1.456</td><td>0.1</td><td>13.7</td><td>O K</td></tr><tr><td>480 min Summer</td><td>1.509</td><td>1.509</td><td>0.1</td><td>14.2</td><td>O K</td></tr><tr><td>600 min Summer</td><td>1.539</td><td>1.539</td><td>0.1</td><td>14.4</td><td>O K</td></tr><tr><td>720 min Summer</td><td>1.555</td><td>1.555</td><td>0.1</td><td>14.6</td><td>O K</td></tr><tr><td>960 min Summer</td><td>1.562</td><td>1.562</td><td>0.1</td><td>14.6</td><td>O K</td></tr><tr><td>1440 min Summer</td><td>1.554</td><td>1.554</td><td>0.1</td><td>14.6</td><td>O K</td></tr><tr><td>2160 min Summer</td><td>1.519</td><td>1.519</td><td>0.1</td><td>14.2</td><td>O K</td></tr><tr><td>2880 min Summer</td><td>1.470</td><td>1.470</td><td>0.1</td><td>13.8</td><td>O K</td></tr><tr><td>4320 min Summer</td><td>1.363</td><td>1.363</td><td>0.1</td><td>12.8</td><td>O K</td></tr><tr><td>5760 min Summer</td><td>1.265</td><td>1.265</td><td>0.1</td><td>11.8</td><td>O K</td></tr><tr><td>7200 min Summer</td><td>1.178</td><td>1.178</td><td>0.1</td><td>11.0</td><td>O K</td></tr><tr><td>8640 min Summer</td><td>1.102</td><td>1.102</td><td>0.1</td><td>10.3</td><td>O K</td></tr><tr><td>10080 min Summer</td><td>1.033</td><td>1.033</td><td>0.1</td><td>9.7</td><td>O K</td></tr><tr><td>15 min Winter</td><td>0.645</td><td>0.645</td><td>0.1</td><td>6.0</td><td>O K</td></tr></table> <table><tr><th>Storm Event</th><th>Rain (mm/hr)</th><th>Flooded Volume (m³)</th><th>Time-Peak (mins)</th></tr><tr><td>15 min Summer</td><td>125.353</td><td>0.0</td><td>19</td></tr><tr><td>30 min Summer</td><td>84.267</td><td>0.0</td><td>34</td></tr><tr><td>60 min Summer</td><td>54.074</td><td>0.0</td><td>64</td></tr><tr><td>120 min Summer</td><td>33.506</td><td>0.0</td><td>124</td></tr><tr><td>180 min Summer</td><td>24.949</td><td>0.0</td><td>182</td></tr><tr><td>240 min Summer</td><td>20.093</td><td>0.0</td><td>242</td></tr><tr><td>360 min Summer</td><td>14.773</td><td>0.0</td><td>362</td></tr><tr><td>480 min Summer</td><td>11.871</td><td>0.0</td><td>482</td></tr><tr><td>600 min Summer</td><td>10.010</td><td>0.0</td><td>600</td></tr><tr><td>720 min Summer</td><td>8.703</td><td>0.0</td><td>720</td></tr><tr><td>960 min Summer</td><td>6.973</td><td>0.0</td><td>896</td></tr><tr><td>1440 min Summer</td><td>5.093</td><td>0.0</td><td>1128</td></tr><tr><td>2160 min Summer</td><td>3.711</td><td>0.0</td><td>1516</td></tr><tr><td>2880 min Summer</td><td>2.961</td><td>0.0</td><td>1932</td></tr><tr><td>4320 min Summer</td><td>2.150</td><td>0.0</td><td>2768</td></tr><tr><td>5760 min Summer</td><td>1.711</td><td>0.0</td><td>3584</td></tr><tr><td>7200 min Summer</td><td>1.432</td><td>0.0</td><td>4400</td></tr><tr><td>8640 min Summer</td><td>1.240</td><td>0.0</td><td>5192</td></tr><tr><td>10080 min Summer</td><td>1.098</td><td>0.0</td><td>5960</td></tr><tr><td>15 min Winter</td><td>125.353</td><td>0.0</td><td>19</td></tr></table>						Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status	15 min Summer	0.576	0.576	0.1	5.4	O K	30 min Summer	0.768	0.768	0.1	7.2	O K	60 min Summer	0.973	0.973	0.1	9.1	O K	120 min Summer	1.182	1.182	0.1	11.1	O K	180 min Summer	1.295	1.295	0.1	12.1	O K	240 min Summer	1.367	1.367	0.1	12.8	O K	360 min Summer	1.456	1.456	0.1	13.7	O K	480 min Summer	1.509	1.509	0.1	14.2	O K	600 min Summer	1.539	1.539	0.1	14.4	O K	720 min Summer	1.555	1.555	0.1	14.6	O K	960 min Summer	1.562	1.562	0.1	14.6	O K	1440 min Summer	1.554	1.554	0.1	14.6	O K	2160 min Summer	1.519	1.519	0.1	14.2	O K	2880 min Summer	1.470	1.470	0.1	13.8	O K	4320 min Summer	1.363	1.363	0.1	12.8	O K	5760 min Summer	1.265	1.265	0.1	11.8	O K	7200 min Summer	1.178	1.178	0.1	11.0	O K	8640 min Summer	1.102	1.102	0.1	10.3	O K	10080 min Summer	1.033	1.033	0.1	9.7	O K	15 min Winter	0.645	0.645	0.1	6.0	O K	Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)	15 min Summer	125.353	0.0	19	30 min Summer	84.267	0.0	34	60 min Summer	54.074	0.0	64	120 min Summer	33.506	0.0	124	180 min Summer	24.949	0.0	182	240 min Summer	20.093	0.0	242	360 min Summer	14.773	0.0	362	480 min Summer	11.871	0.0	482	600 min Summer	10.010	0.0	600	720 min Summer	8.703	0.0	720	960 min Summer	6.973	0.0	896	1440 min Summer	5.093	0.0	1128	2160 min Summer	3.711	0.0	1516	2880 min Summer	2.961	0.0	1932	4320 min Summer	2.150	0.0	2768	5760 min Summer	1.711	0.0	3584	7200 min Summer	1.432	0.0	4400	8640 min Summer	1.240	0.0	5192	10080 min Summer	1.098	0.0	5960	15 min Winter	125.353	0.0	19
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19 - 21 Silvermills Court		Havant Road, Emsworth			
Henderson Place Lane		SUDs Drainage			
Edinburgh EH3 5DG		Trench Soakaway [TSA] 4			
Date 01/03/2017 12:16		Designed by LK/AC			
File Trench SA 4.srcx		Checked by AMF			
Micro Drainage		Source Control 2015.1			
<u>Summary of Results for 100 year Return Period (+40%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	0.860	0.860	0.1	8.0	O K
60 min Winter	1.091	1.091	0.1	10.2	O K
120 min Winter	1.327	1.327	0.1	12.4	O K
180 min Winter	1.457	1.457	0.1	13.7	O K
240 min Winter	1.539	1.539	0.1	14.4	O K
360 min Winter	1.644	1.644	0.1	15.4	O K
480 min Winter	1.710	1.710	0.1	16.0	Flood Risk
600 min Winter	1.753	1.753	0.1	16.4	Flood Risk
720 min Winter	1.779	1.779	0.1	16.7	Flood Risk
960 min Winter	1.802	1.802	0.1	16.9	Flood Risk
1440 min Winter	1.783	1.783	0.1	16.7	Flood Risk
2160 min Winter	1.735	1.735	0.1	16.3	Flood Risk
2880 min Winter	1.665	1.665	0.1	15.6	O K
4320 min Winter	1.512	1.512	0.1	14.2	O K
5760 min Winter	1.368	1.368	0.1	12.8	O K
7200 min Winter	1.244	1.244	0.1	11.7	O K
8640 min Winter	1.137	1.137	0.1	10.6	O K
10080 min Winter	1.041	1.041	0.1	9.7	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)		
30 min Winter	84.267	0.0	33		
60 min Winter	54.074	0.0	64		
120 min Winter	33.506	0.0	122		
180 min Winter	24.949	0.0	180		
240 min Winter	20.093	0.0	238		
360 min Winter	14.773	0.0	356		
480 min Winter	11.871	0.0	472		
600 min Winter	10.010	0.0	584		
720 min Winter	8.703	0.0	700		
960 min Winter	6.973	0.0	920		
1440 min Winter	5.093	0.0	1300		
2160 min Winter	3.711	0.0	1640		
2880 min Winter	2.961	0.0	2080		
4320 min Winter	2.150	0.0	2984		
5760 min Winter	1.711	0.0	3856		
7200 min Winter	1.432	0.0	4688		
8640 min Winter	1.240	0.0	5528		
10080 min Winter	1.098	0.0	6352		
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19 - 21 Silvermills Court Henderson Place Lane Edinburgh EH3 5DG	Havant Road, Emsworth SUDs Drainage Trench Soakaway [TSA] 4	
Date 01/03/2017 12:16 File Trench SA 4.srcx	Designed by LK/AC Checked by AMF	
Micro Drainage	Source Control 2015.1	

Rainfall Details

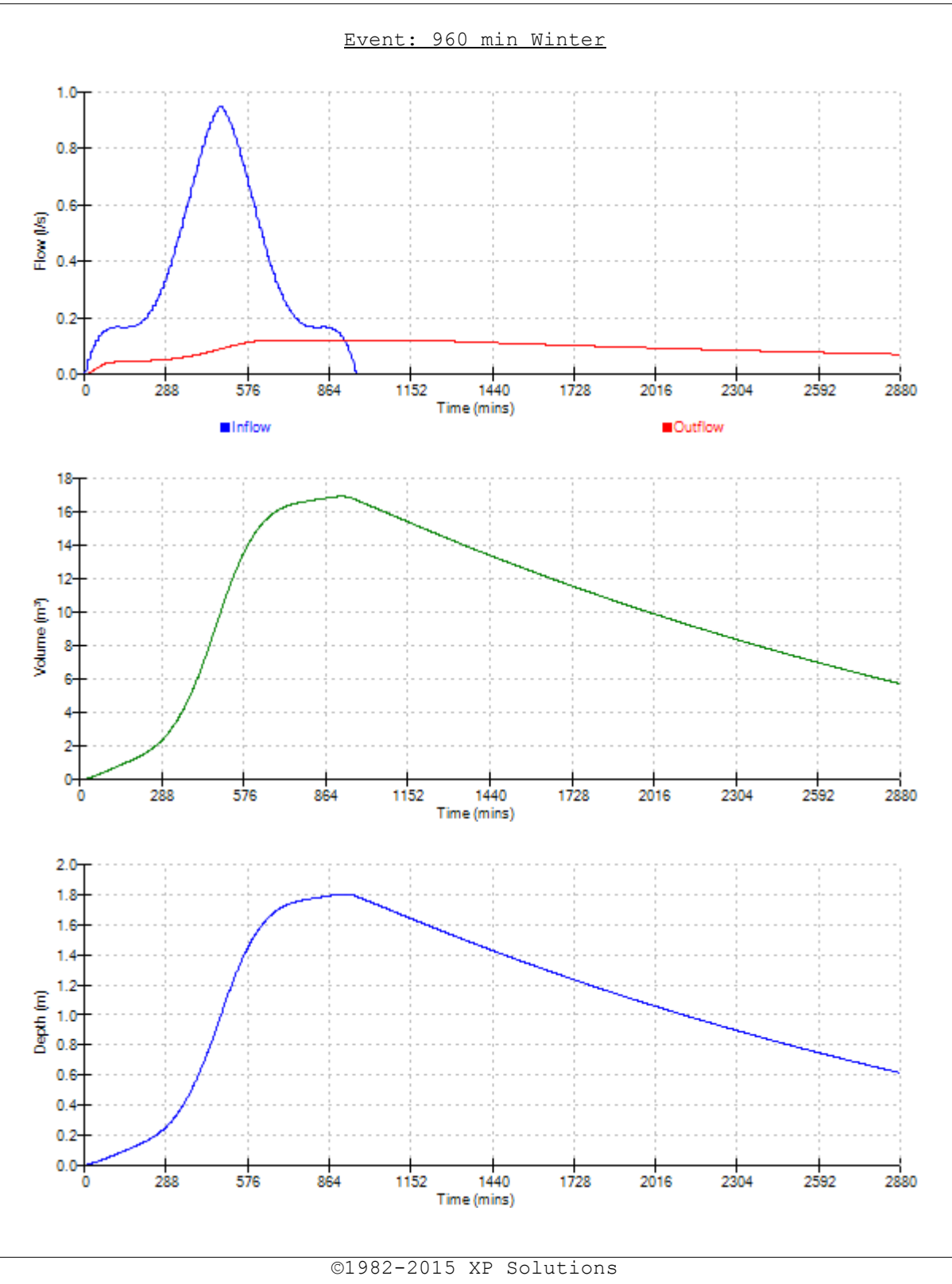
Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.100	Shortest Storm (mins)	15
Ratio R	0.350	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.023

Time (mins)	Area	Time (mins)	Area
From:	To: (ha)	From:	To: (ha)
0	2 0.012	2	4 0.011

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19 - 21 Silvermills Court Henderson Place Lane Edinburgh EH3 5DG	Havant Road, Emsworth SUDs Drainage Trench Soakaway [TSA] 4																					
Date 01/03/2017 12:16 File Trench SA 4.srcx	Designed by LK/AC Checked by AMF																					
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<u>Model Details</u> Storage is Online Cover Level (m) 2.000 <u>Trench Soakaway Structure</u> <table> <tr> <td>Infiltration Coefficient Base (m/hr)</td> <td>0.00900</td> <td>Trench Width (m)</td> <td>1.7</td> </tr> <tr> <td>Infiltration Coefficient Side (m/hr)</td> <td>0.00900</td> <td>Trench Length (m)</td> <td>18.5</td> </tr> <tr> <td>Safety Factor</td> <td>2.0</td> <td>Slope (1:X)</td> <td>1000.0</td> </tr> <tr> <td>Porosity</td> <td>0.30</td> <td>Cap Volume Depth (m)</td> <td>1.800</td> </tr> <tr> <td>Invert Level (m)</td> <td>0.000</td> <td>Cap Infiltration Depth (m)</td> <td>1.600</td> </tr> </table>			Infiltration Coefficient Base (m/hr)	0.00900	Trench Width (m)	1.7	Infiltration Coefficient Side (m/hr)	0.00900	Trench Length (m)	18.5	Safety Factor	2.0	Slope (1:X)	1000.0	Porosity	0.30	Cap Volume Depth (m)	1.800	Invert Level (m)	0.000	Cap Infiltration Depth (m)	1.600
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<u>Summary of Results for 100 year Return Period (+40%)</u> Half Drain Time : 38 minutes. <table><thead><tr><th>Storm Event</th><th>Max Level (m)</th><th>Max Depth (m)</th><th>Max Infiltration (l/s)</th><th>Max Volume (m³)</th><th>Status</th></tr></thead><tbody><tr><td>15 min Summer</td><td>1.317</td><td>1.317</td><td>1.0</td><td>2.5</td><td>O K</td></tr><tr><td>30 min Summer</td><td>1.555</td><td>1.555</td><td>1.1</td><td>2.9</td><td>O K</td></tr><tr><td>60 min Summer</td><td>1.679</td><td>1.679</td><td>1.1</td><td>3.1</td><td>O K</td></tr><tr><td>120 min Summer</td><td>1.617</td><td>1.617</td><td>1.1</td><td>3.0</td><td>O K</td></tr><tr><td>180 min Summer</td><td>1.487</td><td>1.487</td><td>1.1</td><td>2.8</td><td>O K</td></tr><tr><td>240 min Summer</td><td>1.358</td><td>1.358</td><td>1.0</td><td>2.5</td><td>O K</td></tr><tr><td>360 min Summer</td><td>1.149</td><td>1.149</td><td>0.9</td><td>2.1</td><td>O K</td></tr><tr><td>480 min Summer</td><td>0.988</td><td>0.988</td><td>0.8</td><td>1.8</td><td>O K</td></tr><tr><td>600 min Summer</td><td>0.859</td><td>0.859</td><td>0.7</td><td>1.6</td><td>O K</td></tr><tr><td>720 min Summer</td><td>0.753</td><td>0.753</td><td>0.7</td><td>1.4</td><td>O K</td></tr><tr><td>960 min Summer</td><td>0.588</td><td>0.588</td><td>0.6</td><td>1.1</td><td>O K</td></tr><tr><td>1440 min Summer</td><td>0.371</td><td>0.371</td><td>0.5</td><td>0.7</td><td>O K</td></tr><tr><td>2160 min Summer</td><td>0.184</td><td>0.184</td><td>0.4</td><td>0.3</td><td>O K</td></tr><tr><td>2880 min Summer</td><td>0.080</td><td>0.080</td><td>0.3</td><td>0.1</td><td>O K</td></tr><tr><td>4320 min Summer</td><td>0.040</td><td>0.040</td><td>0.2</td><td>0.1</td><td>O K</td></tr><tr><td>5760 min Summer</td><td>0.032</td><td>0.032</td><td>0.2</td><td>0.1</td><td>O K</td></tr><tr><td>7200 min Summer</td><td>0.027</td><td>0.027</td><td>0.2</td><td>0.0</td><td>O K</td></tr><tr><td>8640 min Summer</td><td>0.023</td><td>0.023</td><td>0.1</td><td>0.0</td><td>O K</td></tr><tr><td>10080 min Summer</td><td>0.021</td><td>0.021</td><td>0.1</td><td>0.0</td><td>O K</td></tr><tr><td>15 min Winter</td><td>1.491</td><td>1.491</td><td>1.1</td><td>2.8</td><td>O K</td></tr></tbody></table> <table><thead><tr><th>Storm Event</th><th>Rain (mm/hr)</th><th>Flooded Volume (m³)</th><th>Time-Peak (mins)</th></tr></thead><tbody><tr><td>15 min Summer</td><td>125.353</td><td>0.0</td><td>16</td></tr><tr><td>30 min Summer</td><td>84.267</td><td>0.0</td><td>26</td></tr><tr><td>60 min Summer</td><td>54.074</td><td>0.0</td><td>42</td></tr><tr><td>120 min Summer</td><td>33.506</td><td>0.0</td><td>76</td></tr><tr><td>180 min Summer</td><td>24.949</td><td>0.0</td><td>110</td></tr><tr><td>240 min Summer</td><td>20.093</td><td>0.0</td><td>144</td></tr><tr><td>360 min Summer</td><td>14.773</td><td>0.0</td><td>206</td></tr><tr><td>480 min Summer</td><td>11.871</td><td>0.0</td><td>270</td></tr><tr><td>600 min Summer</td><td>10.010</td><td>0.0</td><td>332</td></tr><tr><td>720 min Summer</td><td>8.703</td><td>0.0</td><td>392</td></tr><tr><td>960 min Summer</td><td>6.973</td><td>0.0</td><td>512</td></tr><tr><td>1440 min Summer</td><td>5.093</td><td>0.0</td><td>752</td></tr><tr><td>2160 min Summer</td><td>3.711</td><td>0.0</td><td>1120</td></tr><tr><td>2880 min Summer</td><td>2.961</td><td>0.0</td><td>1468</td></tr><tr><td>4320 min Summer</td><td>2.150</td><td>0.0</td><td>2136</td></tr><tr><td>5760 min Summer</td><td>1.711</td><td>0.0</td><td>2880</td></tr><tr><td>7200 min Summer</td><td>1.432</td><td>0.0</td><td>3584</td></tr><tr><td>8640 min Summer</td><td>1.240</td><td>0.0</td><td>4344</td></tr><tr><td>10080 min Summer</td><td>1.098</td><td>0.0</td><td>4984</td></tr><tr><td>15 min Winter</td><td>125.353</td><td>0.0</td><td>16</td></tr></tbody></table>						Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status	15 min Summer	1.317	1.317	1.0	2.5	O K	30 min Summer	1.555	1.555	1.1	2.9	O K	60 min Summer	1.679	1.679	1.1	3.1	O K	120 min Summer	1.617	1.617	1.1	3.0	O K	180 min Summer	1.487	1.487	1.1	2.8	O K	240 min Summer	1.358	1.358	1.0	2.5	O K	360 min Summer	1.149	1.149	0.9	2.1	O K	480 min Summer	0.988	0.988	0.8	1.8	O K	600 min Summer	0.859	0.859	0.7	1.6	O K	720 min Summer	0.753	0.753	0.7	1.4	O K	960 min Summer	0.588	0.588	0.6	1.1	O K	1440 min Summer	0.371	0.371	0.5	0.7	O K	2160 min Summer	0.184	0.184	0.4	0.3	O K	2880 min Summer	0.080	0.080	0.3	0.1	O K	4320 min Summer	0.040	0.040	0.2	0.1	O K	5760 min Summer	0.032	0.032	0.2	0.1	O K	7200 min Summer	0.027	0.027	0.2	0.0	O K	8640 min Summer	0.023	0.023	0.1	0.0	O K	10080 min Summer	0.021	0.021	0.1	0.0	O K	15 min Winter	1.491	1.491	1.1	2.8	O K	Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)	15 min Summer	125.353	0.0	16	30 min Summer	84.267	0.0	26	60 min Summer	54.074	0.0	42	120 min Summer	33.506	0.0	76	180 min Summer	24.949	0.0	110	240 min Summer	20.093	0.0	144	360 min Summer	14.773	0.0	206	480 min Summer	11.871	0.0	270	600 min Summer	10.010	0.0	332	720 min Summer	8.703	0.0	392	960 min Summer	6.973	0.0	512	1440 min Summer	5.093	0.0	752	2160 min Summer	3.711	0.0	1120	2880 min Summer	2.961	0.0	1468	4320 min Summer	2.150	0.0	2136	5760 min Summer	1.711	0.0	2880	7200 min Summer	1.432	0.0	3584	8640 min Summer	1.240	0.0	4344	10080 min Summer	1.098	0.0	4984	15 min Winter	125.353	0.0	16
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19 - 21 Silvermills Court		Havant Road, Emsworth			
Henderson Place Lane		SUDs Drainage			
Edinburgh EH3 5DG		Trench Soakaway [TSA] 5			
Date 01/03/2017 10:51		Designed by LK/AC			
File TRENCH SA 5.SRCX		Checked by AMF			
Micro Drainage		Source Control 2015.1			
<u>Summary of Results for 100 year Return Period (+40%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	1.777	1.777	1.1	3.3	Flood Risk
60 min Winter	1.996	1.996	1.1	3.6	Flood Risk
120 min Winter	1.764	1.764	1.1	3.3	Flood Risk
180 min Winter	1.546	1.546	1.1	2.9	O K
240 min Winter	1.363	1.363	1.0	2.5	O K
360 min Winter	1.084	1.084	0.8	2.0	O K
480 min Winter	0.881	0.881	0.7	1.6	O K
600 min Winter	0.726	0.726	0.7	1.4	O K
720 min Winter	0.605	0.605	0.6	1.1	O K
960 min Winter	0.426	0.426	0.5	0.8	O K
1440 min Winter	0.209	0.209	0.4	0.4	O K
2160 min Winter	0.050	0.050	0.3	0.1	O K
2880 min Winter	0.040	0.040	0.2	0.1	O K
4320 min Winter	0.029	0.029	0.2	0.0	O K
5760 min Winter	0.023	0.023	0.1	0.0	O K
7200 min Winter	0.020	0.020	0.1	0.0	O K
8640 min Winter	0.017	0.017	0.1	0.0	O K
10080 min Winter	0.015	0.015	0.1	0.0	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)		
30 min Winter	84.267	0.0	28		
60 min Winter	54.074	0.0	46		
120 min Winter	33.506	0.0	84		
180 min Winter	24.949	0.0	116		
240 min Winter	20.093	0.0	150		
360 min Winter	14.773	0.0	216		
480 min Winter	11.871	0.0	280		
600 min Winter	10.010	0.0	342		
720 min Winter	8.703	0.0	404		
960 min Winter	6.973	0.0	528		
1440 min Winter	5.093	0.0	766		
2160 min Winter	3.711	0.0	1100		
2880 min Winter	2.961	0.0	1456		
4320 min Winter	2.150	0.0	2200		
5760 min Winter	1.711	0.0	2912		
7200 min Winter	1.432	0.0	3656		
8640 min Winter	1.240	0.0	4400		
10080 min Winter	1.098	0.0	5032		
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19 - 21 Silvermills Court Henderson Place Lane Edinburgh EH3 5DG	Havant Road, Emsworth SUDs Drainage Trench Soakaway [TSA] 5	
Date 01/03/2017 10:51 File TRENCH SA 5.SRCX	Designed by LK/AC Checked by AMF	
Micro Drainage Source Control 2015.1		

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.100	Shortest Storm (mins)	15
Ratio R	0.350	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

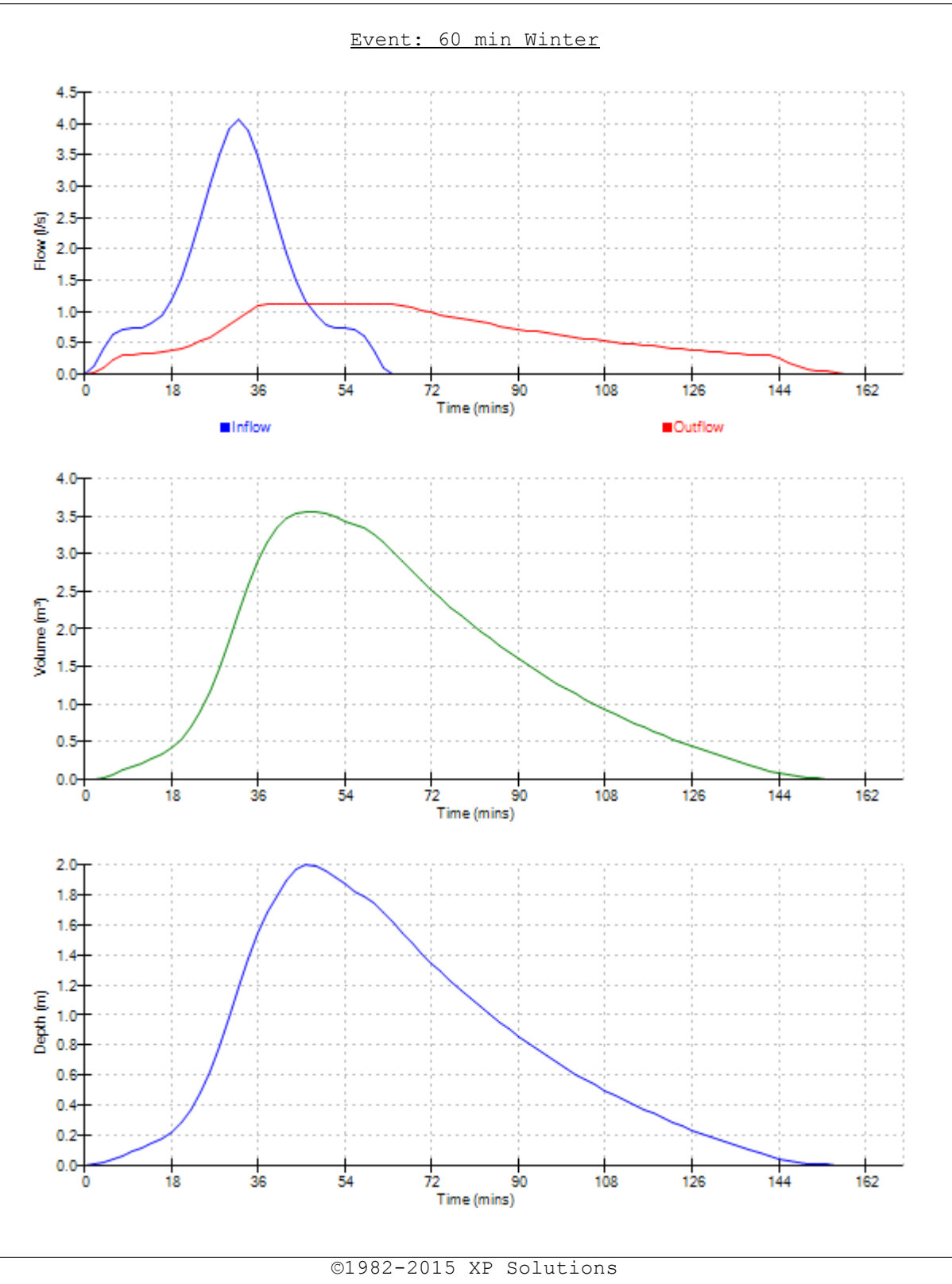
Time Area Diagram

Total Area (ha) 0.013

Time (mins)	Area	Time (mins)	Area
From: To:	(ha)	From: To:	(ha)
0 2	0.007	2 4	0.006

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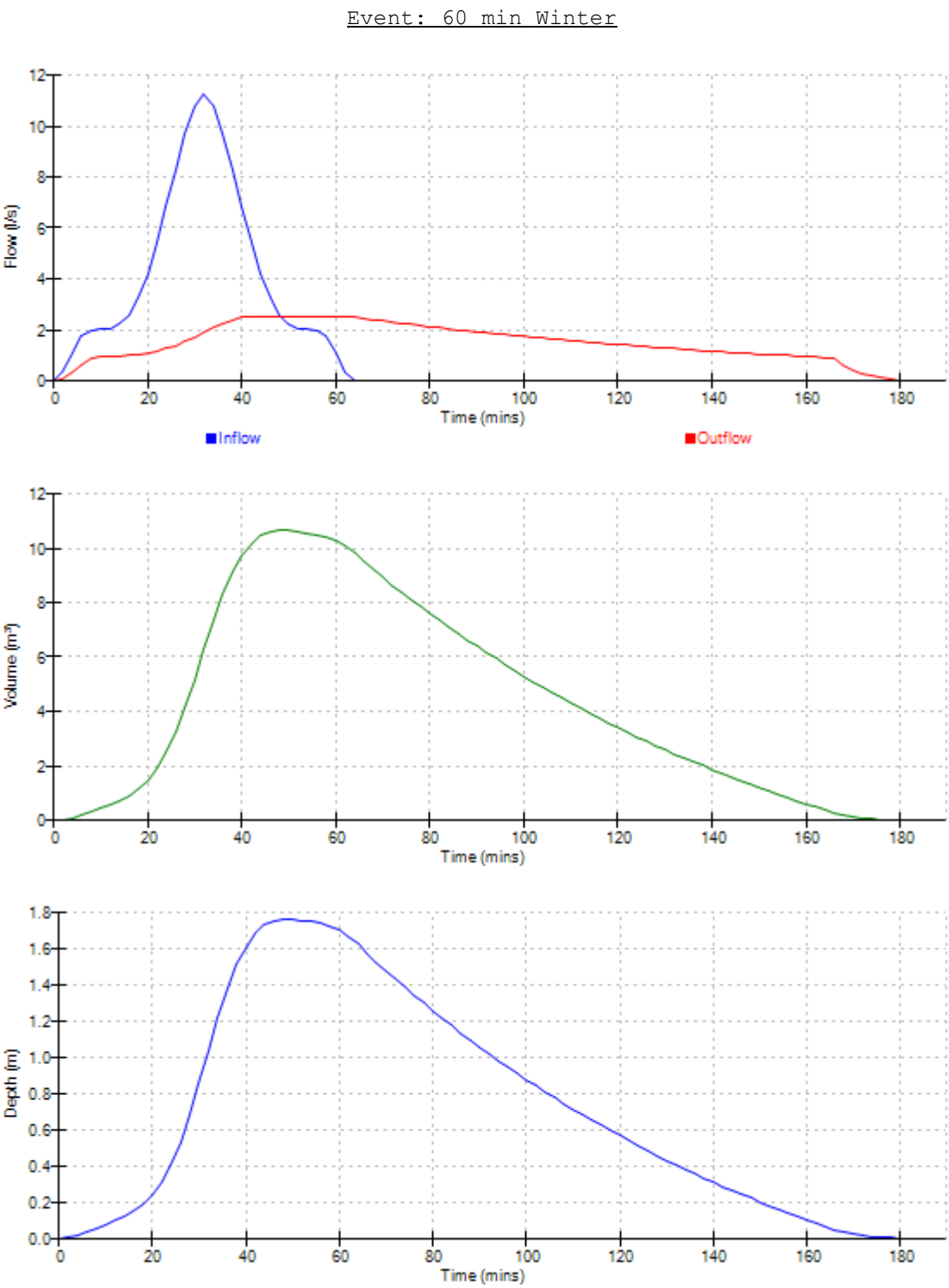
Cundall, Johnston & Partners		Page 4																				
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<u>Model Details</u> Storage is Online Cover Level (m) 2.000 <u>Trench Soakaway Structure</u> <table> <tr> <td>Infiltration Coefficient Base (m/hr)</td> <td>0.30240</td> <td>Trench Width (m)</td> <td>1.2</td> </tr> <tr> <td>Infiltration Coefficient Side (m/hr)</td> <td>0.30240</td> <td>Trench Length (m)</td> <td>5.2</td> </tr> <tr> <td>Safety Factor</td> <td>2.0</td> <td>Slope (1:X)</td> <td>1000.0</td> </tr> <tr> <td>Porosity</td> <td>0.30</td> <td>Cap Volume Depth (m)</td> <td>1.800</td> </tr> <tr> <td>Invert Level (m)</td> <td>0.000</td> <td>Cap Infiltration Depth (m)</td> <td>1.600</td> </tr> </table>			Infiltration Coefficient Base (m/hr)	0.30240	Trench Width (m)	1.2	Infiltration Coefficient Side (m/hr)	0.30240	Trench Length (m)	5.2	Safety Factor	2.0	Slope (1:X)	1000.0	Porosity	0.30	Cap Volume Depth (m)	1.800	Invert Level (m)	0.000	Cap Infiltration Depth (m)	1.600
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<u>Summary of Results for 100 year Return Period (+40%)</u> Half Drain Time : 44 minutes. <table><tr><th>Storm Event</th><th>Max Level (m)</th><th>Max Depth (m)</th><th>Max Infiltration (l/s)</th><th>Max Volume (m³)</th><th>Status</th></tr><tr><td>15 min Summer</td><td>1.170</td><td>1.170</td><td>2.0</td><td>7.1</td><td>O K</td></tr><tr><td>30 min Summer</td><td>1.412</td><td>1.412</td><td>2.3</td><td>8.5</td><td>O K</td></tr><tr><td>60 min Summer</td><td>1.540</td><td>1.540</td><td>2.4</td><td>9.3</td><td>O K</td></tr><tr><td>120 min Summer</td><td>1.523</td><td>1.523</td><td>2.4</td><td>9.2</td><td>O K</td></tr><tr><td>180 min Summer</td><td>1.429</td><td>1.429</td><td>2.3</td><td>8.6</td><td>O K</td></tr><tr><td>240 min Summer</td><td>1.328</td><td>1.328</td><td>2.2</td><td>8.0</td><td>O K</td></tr><tr><td>360 min Summer</td><td>1.147</td><td>1.147</td><td>2.0</td><td>6.9</td><td>O K</td></tr><tr><td>480 min Summer</td><td>0.997</td><td>0.997</td><td>1.9</td><td>6.0</td><td>O K</td></tr><tr><td>600 min Summer</td><td>0.870</td><td>0.870</td><td>1.7</td><td>5.2</td><td>O K</td></tr><tr><td>720 min Summer</td><td>0.761</td><td>0.761</td><td>1.6</td><td>4.6</td><td>O K</td></tr><tr><td>960 min Summer</td><td>0.585</td><td>0.585</td><td>1.4</td><td>3.5</td><td>O K</td></tr><tr><td>1440 min Summer</td><td>0.345</td><td>0.345</td><td>1.2</td><td>2.1</td><td>O K</td></tr><tr><td>2160 min Summer</td><td>0.135</td><td>0.135</td><td>1.0</td><td>0.8</td><td>O K</td></tr><tr><td>2880 min Summer</td><td>0.049</td><td>0.049</td><td>0.9</td><td>0.3</td><td>O K</td></tr><tr><td>4320 min Summer</td><td>0.036</td><td>0.036</td><td>0.6</td><td>0.2</td><td>O K</td></tr><tr><td>5760 min Summer</td><td>0.028</td><td>0.028</td><td>0.5</td><td>0.1</td><td>O K</td></tr><tr><td>7200 min Summer</td><td>0.024</td><td>0.024</td><td>0.4</td><td>0.1</td><td>O K</td></tr><tr><td>8640 min Summer</td><td>0.021</td><td>0.021</td><td>0.4</td><td>0.1</td><td>O K</td></tr><tr><td>10080 min Summer</td><td>0.018</td><td>0.018</td><td>0.3</td><td>0.1</td><td>O K</td></tr><tr><td>15 min Winter</td><td>1.326</td><td>1.326</td><td>2.2</td><td>8.0</td><td>O K</td></tr></table> <table><tr><th>Storm Event</th><th>Rain (mm/hr)</th><th>Flooded Volume (m³)</th><th>Time-Peak (mins)</th></tr><tr><td>15 min Summer</td><td>125.353</td><td>0.0</td><td>17</td></tr><tr><td>30 min Summer</td><td>84.267</td><td>0.0</td><td>30</td></tr><tr><td>60 min Summer</td><td>54.074</td><td>0.0</td><td>46</td></tr><tr><td>120 min Summer</td><td>33.506</td><td>0.0</td><td>80</td></tr><tr><td>180 min Summer</td><td>24.949</td><td>0.0</td><td>114</td></tr><tr><td>240 min Summer</td><td>20.093</td><td>0.0</td><td>148</td></tr><tr><td>360 min Summer</td><td>14.773</td><td>0.0</td><td>214</td></tr><tr><td>480 min Summer</td><td>11.871</td><td>0.0</td><td>278</td></tr><tr><td>600 min Summer</td><td>10.010</td><td>0.0</td><td>340</td></tr><tr><td>720 min Summer</td><td>8.703</td><td>0.0</td><td>404</td></tr><tr><td>960 min Summer</td><td>6.973</td><td>0.0</td><td>524</td></tr><tr><td>1440 min Summer</td><td>5.093</td><td>0.0</td><td>766</td></tr><tr><td>2160 min Summer</td><td>3.711</td><td>0.0</td><td>1124</td></tr><tr><td>2880 min Summer</td><td>2.961</td><td>0.0</td><td>1464</td></tr><tr><td>4320 min Summer</td><td>2.150</td><td>0.0</td><td>2184</td></tr><tr><td>5760 min Summer</td><td>1.711</td><td>0.0</td><td>2936</td></tr><tr><td>7200 min Summer</td><td>1.432</td><td>0.0</td><td>3632</td></tr><tr><td>8640 min Summer</td><td>1.240</td><td>0.0</td><td>4312</td></tr><tr><td>10080 min Summer</td><td>1.098</td><td>0.0</td><td>5008</td></tr><tr><td>15 min Winter</td><td>125.353</td><td>0.0</td><td>17</td></tr></table>						Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status	15 min Summer	1.170	1.170	2.0	7.1	O K	30 min Summer	1.412	1.412	2.3	8.5	O K	60 min Summer	1.540	1.540	2.4	9.3	O K	120 min Summer	1.523	1.523	2.4	9.2	O K	180 min Summer	1.429	1.429	2.3	8.6	O K	240 min Summer	1.328	1.328	2.2	8.0	O K	360 min Summer	1.147	1.147	2.0	6.9	O K	480 min Summer	0.997	0.997	1.9	6.0	O K	600 min Summer	0.870	0.870	1.7	5.2	O K	720 min Summer	0.761	0.761	1.6	4.6	O K	960 min Summer	0.585	0.585	1.4	3.5	O K	1440 min Summer	0.345	0.345	1.2	2.1	O K	2160 min Summer	0.135	0.135	1.0	0.8	O K	2880 min Summer	0.049	0.049	0.9	0.3	O K	4320 min Summer	0.036	0.036	0.6	0.2	O K	5760 min Summer	0.028	0.028	0.5	0.1	O K	7200 min Summer	0.024	0.024	0.4	0.1	O K	8640 min Summer	0.021	0.021	0.4	0.1	O K	10080 min Summer	0.018	0.018	0.3	0.1	O K	15 min Winter	1.326	1.326	2.2	8.0	O K	Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)	15 min Summer	125.353	0.0	17	30 min Summer	84.267	0.0	30	60 min Summer	54.074	0.0	46	120 min Summer	33.506	0.0	80	180 min Summer	24.949	0.0	114	240 min Summer	20.093	0.0	148	360 min Summer	14.773	0.0	214	480 min Summer	11.871	0.0	278	600 min Summer	10.010	0.0	340	720 min Summer	8.703	0.0	404	960 min Summer	6.973	0.0	524	1440 min Summer	5.093	0.0	766	2160 min Summer	3.711	0.0	1124	2880 min Summer	2.961	0.0	1464	4320 min Summer	2.150	0.0	2184	5760 min Summer	1.711	0.0	2936	7200 min Summer	1.432	0.0	3632	8640 min Summer	1.240	0.0	4312	10080 min Summer	1.098	0.0	5008	15 min Winter	125.353	0.0	17
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19 - 21 Silvermills Court Henderson Place Lane Edinburgh EH3 5DG			Havant Road, Emsworth SUDs Drainage Trench Soakaway [TSA] 6			
Date 28/02/2017 20:51 File TRENCH SA 6.SRCX			Designed by LK/AC Checked by AMF			
Micro Drainage			Source Control 2015.1			
Summary of Results for 100 year Return Period (+40%)						
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status	
30 min Winter	1.617	1.617	2.5	9.8	O K	
60 min Winter	1.765	1.765	2.5	10.7	Flood Risk	
120 min Winter	1.712	1.712	2.5	10.3	Flood Risk	
180 min Winter	1.552	1.552	2.4	9.4	O K	
240 min Winter	1.399	1.399	2.3	8.4	O K	
360 min Winter	1.141	1.141	2.0	6.9	O K	
480 min Winter	0.937	0.937	1.8	5.6	O K	
600 min Winter	0.772	0.772	1.6	4.6	O K	
720 min Winter	0.637	0.637	1.5	3.8	O K	
960 min Winter	0.429	0.429	1.3	2.6	O K	
1440 min Winter	0.165	0.165	1.0	1.0	O K	
2160 min Winter	0.044	0.044	0.8	0.2	O K	
2880 min Winter	0.035	0.035	0.6	0.2	O K	
4320 min Winter	0.026	0.026	0.5	0.1	O K	
5760 min Winter	0.021	0.021	0.4	0.1	O K	
7200 min Winter	0.017	0.017	0.3	0.1	O K	
8640 min Winter	0.015	0.015	0.3	0.1	O K	
10080 min Winter	0.013	0.013	0.2	0.1	O K	
Storm Event	Rain (mm/hr)		Flooded Volume (m³)	Time-Peak (mins)		
30 min Winter	84.267		0.0	30		
60 min Winter	54.074		0.0	48		
120 min Winter	33.506		0.0	86		
180 min Winter	24.949		0.0	122		
240 min Winter	20.093		0.0	158		
360 min Winter	14.773		0.0	226		
480 min Winter	11.871		0.0	292		
600 min Winter	10.010		0.0	356		
720 min Winter	8.703		0.0	418		
960 min Winter	6.973		0.0	540		
1440 min Winter	5.093		0.0	780		
2160 min Winter	3.711		0.0	1088		
2880 min Winter	2.961		0.0	1468		
4320 min Winter	2.150		0.0	2140		
5760 min Winter	1.711		0.0	2952		
7200 min Winter	1.432		0.0	3616		
8640 min Winter	1.240		0.0	4248		
10080 min Winter	1.098		0.0	5136		
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19 - 21 Silvermills Court Henderson Place Lane Edinburgh EH3 5DG	Havant Road, Emsworth SUDs Drainage Trench Soakaway [TSA] 6																					
Date 28/02/2017 20:51 File TRENCH SA 6.SRCX	Designed by LK/AC Checked by AMF																					
Micro Drainage Source Control 2015.1																						
<u>Model Details</u> Storage is Online Cover Level (m) 2.000 <u>Trench Soakaway Structure</u> <table> <tr> <td>Infiltration Coefficient Base (m/hr)</td> <td>0.30240</td> <td>Trench Width (m)</td> <td>2.0</td> </tr> <tr> <td>Infiltration Coefficient Side (m/hr)</td> <td>0.30240</td> <td>Trench Length (m)</td> <td>10.1</td> </tr> <tr> <td>Safety Factor</td> <td>2.0</td> <td>Slope (1:X)</td> <td>1000.0</td> </tr> <tr> <td>Porosity</td> <td>0.30</td> <td>Cap Volume Depth (m)</td> <td>1.800</td> </tr> <tr> <td>Invert Level (m)</td> <td>0.000</td> <td>Cap Infiltration Depth (m)</td> <td>1.600</td> </tr> </table>			Infiltration Coefficient Base (m/hr)	0.30240	Trench Width (m)	2.0	Infiltration Coefficient Side (m/hr)	0.30240	Trench Length (m)	10.1	Safety Factor	2.0	Slope (1:X)	1000.0	Porosity	0.30	Cap Volume Depth (m)	1.800	Invert Level (m)	0.000	Cap Infiltration Depth (m)	1.600
Infiltration Coefficient Base (m/hr)	0.30240	Trench Width (m)	2.0																			
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Summer</td><td>1.361</td><td>1.361</td><td>1.2</td><td>10.3</td><td>O K</td></tr><tr><td>600 min Summer</td><td>1.276</td><td>1.276</td><td>1.2</td><td>9.7</td><td>O K</td></tr><tr><td>720 min Summer</td><td>1.197</td><td>1.197</td><td>1.1</td><td>9.1</td><td>O K</td></tr><tr><td>960 min Summer</td><td>1.058</td><td>1.058</td><td>1.0</td><td>8.0</td><td>O K</td></tr><tr><td>1440 min Summer</td><td>0.839</td><td>0.839</td><td>0.9</td><td>6.4</td><td>O K</td></tr><tr><td>2160 min Summer</td><td>0.605</td><td>0.605</td><td>0.8</td><td>4.6</td><td>O K</td></tr><tr><td>2880 min Summer</td><td>0.441</td><td>0.441</td><td>0.7</td><td>3.3</td><td>O K</td></tr><tr><td>4320 min Summer</td><td>0.229</td><td>0.229</td><td>0.5</td><td>1.7</td><td>O K</td></tr><tr><td>5760 min Summer</td><td>0.105</td><td>0.105</td><td>0.5</td><td>0.7</td><td>O K</td></tr><tr><td>7200 min Summer</td><td>0.049</td><td>0.049</td><td>0.4</td><td>0.3</td><td>O K</td></tr><tr><td>8640 min Summer</td><td>0.042</td><td>0.042</td><td>0.4</td><td>0.3</td><td>O K</td></tr><tr><td>10080 min Summer</td><td>0.038</td><td>0.038</td><td>0.3</td><td>0.2</td><td>O K</td></tr><tr><td>15 min Winter</td><td>1.149</td><td>1.149</td><td>1.1</td><td>8.7</td><td>O K</td></tr></tbody></table> <table><thead><tr><th>Storm Event</th><th>Rain (mm/hr)</th><th>Flooded Volume (m³)</th><th>Time-Peak (mins)</th></tr></thead><tbody><tr><td>15 min Summer</td><td>125.353</td><td>0.0</td><td>18</td></tr><tr><td>30 min Summer</td><td>84.267</td><td>0.0</td><td>32</td></tr><tr><td>60 min Summer</td><td>54.074</td><td>0.0</td><td>60</td></tr><tr><td>120 min Summer</td><td>33.506</td><td>0.0</td><td>92</td></tr><tr><td>180 min Summer</td><td>24.949</td><td>0.0</td><td>126</td></tr><tr><td>240 min Summer</td><td>20.093</td><td>0.0</td><td>160</td></tr><tr><td>360 min Summer</td><td>14.773</td><td>0.0</td><td>230</td></tr><tr><td>480 min Summer</td><td>11.871</td><td>0.0</td><td>298</td></tr><tr><td>600 min Summer</td><td>10.010</td><td>0.0</td><td>364</td></tr><tr><td>720 min Summer</td><td>8.703</td><td>0.0</td><td>430</td></tr><tr><td>960 min Summer</td><td>6.973</td><td>0.0</td><td>560</td></tr><tr><td>1440 min Summer</td><td>5.093</td><td>0.0</td><td>810</td></tr><tr><td>2160 min Summer</td><td>3.711</td><td>0.0</td><td>1188</td></tr><tr><td>2880 min Summer</td><td>2.961</td><td>0.0</td><td>1552</td></tr><tr><td>4320 min Summer</td><td>2.150</td><td>0.0</td><td>2252</td></tr><tr><td>5760 min Summer</td><td>1.711</td><td>0.0</td><td>2944</td></tr><tr><td>7200 min Summer</td><td>1.432</td><td>0.0</td><td>3632</td></tr><tr><td>8640 min Summer</td><td>1.240</td><td>0.0</td><td>4304</td></tr><tr><td>10080 min Summer</td><td>1.098</td><td>0.0</td><td>5136</td></tr><tr><td>15 min Winter</td><td>125.353</td><td>0.0</td><td>18</td></tr></tbody></table>						Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status	15 min Summer	1.020	1.020	1.0	7.7	O K	30 min Summer	1.301	1.301	1.2	9.9	O K	60 min Summer	1.507	1.507	1.3	11.5	O K	120 min Summer	1.598	1.598	1.3	12.2	O K	180 min Summer	1.595	1.595	1.3	12.1	O K	240 min Summer	1.555	1.555	1.3	11.8	O K	360 min Summer	1.455	1.455	1.3	11.1	O K	480 min Summer	1.361	1.361	1.2	10.3	O K	600 min Summer	1.276	1.276	1.2	9.7	O K	720 min Summer	1.197	1.197	1.1	9.1	O K	960 min Summer	1.058	1.058	1.0	8.0	O K	1440 min Summer	0.839	0.839	0.9	6.4	O K	2160 min Summer	0.605	0.605	0.8	4.6	O K	2880 min Summer	0.441	0.441	0.7	3.3	O K	4320 min Summer	0.229	0.229	0.5	1.7	O K	5760 min Summer	0.105	0.105	0.5	0.7	O K	7200 min Summer	0.049	0.049	0.4	0.3	O K	8640 min Summer	0.042	0.042	0.4	0.3	O K	10080 min Summer	0.038	0.038	0.3	0.2	O K	15 min Winter	1.149	1.149	1.1	8.7	O K	Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)	15 min Summer	125.353	0.0	18	30 min Summer	84.267	0.0	32	60 min Summer	54.074	0.0	60	120 min Summer	33.506	0.0	92	180 min Summer	24.949	0.0	126	240 min Summer	20.093	0.0	160	360 min Summer	14.773	0.0	230	480 min Summer	11.871	0.0	298	600 min Summer	10.010	0.0	364	720 min Summer	8.703	0.0	430	960 min Summer	6.973	0.0	560	1440 min Summer	5.093	0.0	810	2160 min Summer	3.711	0.0	1188	2880 min Summer	2.961	0.0	1552	4320 min Summer	2.150	0.0	2252	5760 min Summer	1.711	0.0	2944	7200 min Summer	1.432	0.0	3632	8640 min Summer	1.240	0.0	4304	10080 min Summer	1.098	0.0	5136	15 min Winter	125.353	0.0	18
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240 min Summer	1.555	1.555	1.3	11.8	O K																																																																																																																																																																																																																		
360 min Summer	1.455	1.455	1.3	11.1	O K																																																																																																																																																																																																																		
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Cundall, Johnston & Partners					Page 2	
19 - 21 Silvermills Court		Havant Road, Emsworth				
Henderson Place Lane		SUDs Drainage				
Edinburgh EH3 5DG		Trench Soakaway [TSA] 7				
Date 01/03/2017 14:15		Designed by LK/AC				
File TRENCH SA 7.SRCX		Checked by AMF				
Micro Drainage		Source Control 2015.1				
<u>Summary of Results for 100 year Return Period (+40%)</u>						
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status	
30 min Winter	1.471	1.471	1.3	11.2	O K	
60 min Winter	1.724	1.724	1.4	13.1	Flood Risk	
120 min Winter	1.986	1.986	1.4	14.0	Flood Risk	
180 min Winter	1.890	1.890	1.4	13.9	Flood Risk	
240 min Winter	1.755	1.755	1.4	13.4	Flood Risk	
360 min Winter	1.596	1.596	1.3	12.1	O K	
480 min Winter	1.453	1.453	1.3	11.0	O K	
600 min Winter	1.328	1.328	1.2	10.1	O K	
720 min Winter	1.217	1.217	1.1	9.2	O K	
960 min Winter	1.027	1.027	1.0	7.8	O K	
1440 min Winter	0.743	0.743	0.8	5.6	O K	
2160 min Winter	0.465	0.465	0.7	3.5	O K	
2880 min Winter	0.283	0.283	0.6	2.1	O K	
4320 min Winter	0.071	0.071	0.4	0.5	O K	
5760 min Winter	0.042	0.042	0.4	0.3	O K	
7200 min Winter	0.036	0.036	0.3	0.2	O K	
8640 min Winter	0.031	0.031	0.3	0.2	O K	
10080 min Winter	0.027	0.027	0.2	0.1	O K	
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)			
30 min Winter	84.267	0.0	31			
60 min Winter	54.074	0.0	60			
120 min Winter	33.506	0.0	98			
180 min Winter	24.949	0.0	136			
240 min Winter	20.093	0.0	174			
360 min Winter	14.773	0.0	246			
480 min Winter	11.871	0.0	318			
600 min Winter	10.010	0.0	386			
720 min Winter	8.703	0.0	456			
960 min Winter	6.973	0.0	588			
1440 min Winter	5.093	0.0	848			
2160 min Winter	3.711	0.0	1212			
2880 min Winter	2.961	0.0	1584			
4320 min Winter	2.150	0.0	2248			
5760 min Winter	1.711	0.0	2920			
7200 min Winter	1.432	0.0	3616			
8640 min Winter	1.240	0.0	4280			
10080 min Winter	1.098	0.0	5120			
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19 - 21 Silvermills Court Henderson Place Lane Edinburgh EH3 5DG	Havant Road, Emsworth SUDs Drainage Trench Soakaway [TSA] 7	
Date 01/03/2017 14:15 File TRENCH SA 7.SRCX	Designed by LK/AC Checked by AMF	
Micro Drainage	Source Control 2015.1	

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.100	Shortest Storm (mins)	15
Ratio R	0.350	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

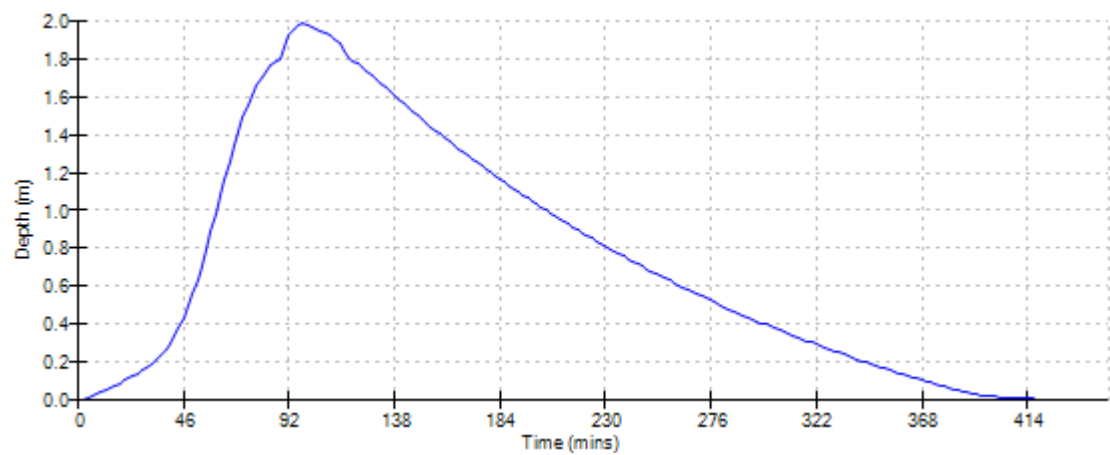
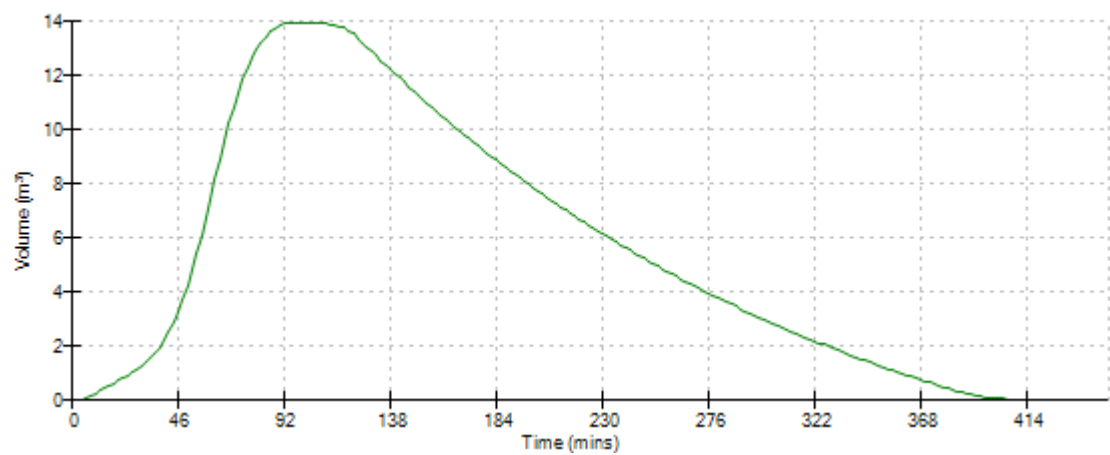
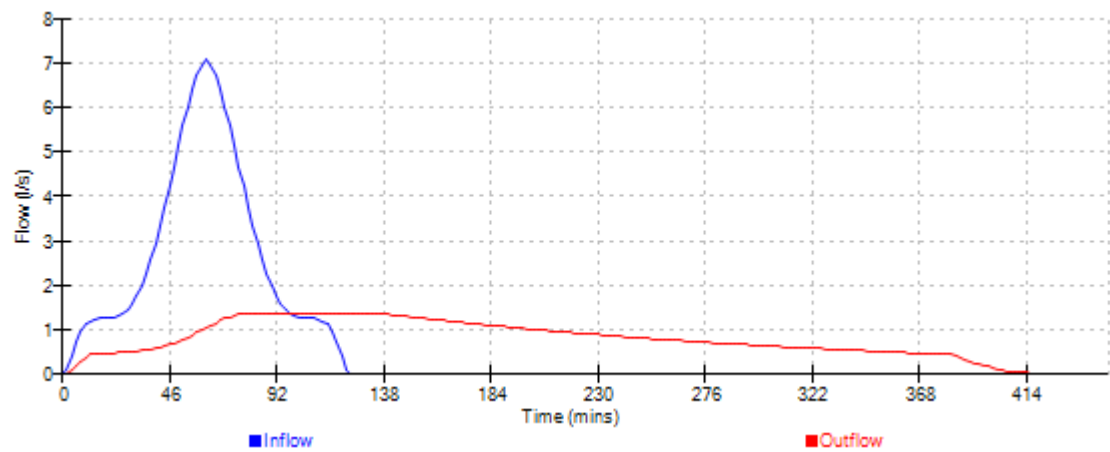
Time Area Diagram

Total Area (ha) 0.036

Time (mins)	Area	Time (mins)	Area
From: To:	(ha)	From: To:	(ha)
0 2	0.018	2 4	0.018

Cundall, Johnston & Partners		Page 4																				
19 - 21 Silvermills Court Henderson Place Lane Edinburgh EH3 5DG	Havant Road, Emsworth SUDs Drainage Trench Soakaway [TSA] 7																					
Date 01/03/2017 14:15 File TRENCH SA 7.SRCX	Designed by LK/AC Checked by AMF																					
Micro Drainage Source Control 2015.1																						
<u>Model Details</u> Storage is Online Cover Level (m) 2.000 <u>Trench Soakaway Structure</u> <table> <tr> <td>Infiltration Coefficient Base (m/hr)</td> <td>0.11520</td> <td>Trench Width (m)</td> <td>1.5</td> </tr> <tr> <td>Infiltration Coefficient Side (m/hr)</td> <td>0.11520</td> <td>Trench Length (m)</td> <td>17.0</td> </tr> <tr> <td>Safety Factor</td> <td>2.0</td> <td>Slope (1:X)</td> <td>1000.0</td> </tr> <tr> <td>Porosity</td> <td>0.30</td> <td>Cap Volume Depth (m)</td> <td>1.800</td> </tr> <tr> <td>Invert Level (m)</td> <td>0.000</td> <td>Cap Infiltration Depth (m)</td> <td>1.600</td> </tr> </table>			Infiltration Coefficient Base (m/hr)	0.11520	Trench Width (m)	1.5	Infiltration Coefficient Side (m/hr)	0.11520	Trench Length (m)	17.0	Safety Factor	2.0	Slope (1:X)	1000.0	Porosity	0.30	Cap Volume Depth (m)	1.800	Invert Level (m)	0.000	Cap Infiltration Depth (m)	1.600
Infiltration Coefficient Base (m/hr)	0.11520	Trench Width (m)	1.5																			
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Event: 120 min Winter



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<u>Summary of Results for 100 year Return Period (+40%)</u> Half Drain Time : 62 minutes. <table><tr><th>Storm Event</th><th>Max Level (m)</th><th>Max Depth (m)</th><th>Max Infiltration (l/s)</th><th>Max Volume (m³)</th><th>Status</th></tr><tr><td>15 min Summer</td><td>1.125</td><td>1.125</td><td>1.4</td><td>6.4</td><td>O K</td></tr><tr><td>30 min Summer</td><td>1.391</td><td>1.391</td><td>1.6</td><td>8.0</td><td>O K</td></tr><tr><td>60 min Summer</td><td>1.556</td><td>1.556</td><td>1.8</td><td>8.9</td><td>O K</td></tr><tr><td>120 min Summer</td><td>1.618</td><td>1.618</td><td>1.8</td><td>9.3</td><td>O K</td></tr><tr><td>180 min Summer</td><td>1.575</td><td>1.575</td><td>1.8</td><td>9.0</td><td>O K</td></tr><tr><td>240 min Summer</td><td>1.504</td><td>1.504</td><td>1.7</td><td>8.6</td><td>O K</td></tr><tr><td>360 min Summer</td><td>1.360</td><td>1.360</td><td>1.6</td><td>7.8</td><td>O K</td></tr><tr><td>480 min Summer</td><td>1.238</td><td>1.238</td><td>1.5</td><td>7.1</td><td>O K</td></tr><tr><td>600 min Summer</td><td>1.134</td><td>1.134</td><td>1.4</td><td>6.5</td><td>O K</td></tr><tr><td>720 min Summer</td><td>1.045</td><td>1.045</td><td>1.3</td><td>6.0</td><td>O K</td></tr><tr><td>960 min Summer</td><td>0.901</td><td>0.901</td><td>1.2</td><td>5.1</td><td>O K</td></tr><tr><td>1440 min Summer</td><td>0.694</td><td>0.694</td><td>1.0</td><td>4.0</td><td>O K</td></tr><tr><td>2160 min Summer</td><td>0.496</td><td>0.496</td><td>0.8</td><td>2.8</td><td>O K</td></tr><tr><td>2880 min Summer</td><td>0.369</td><td>0.369</td><td>0.6</td><td>2.1</td><td>O K</td></tr><tr><td>4320 min Summer</td><td>0.210</td><td>0.210</td><td>0.5</td><td>1.2</td><td>O K</td></tr><tr><td>5760 min Summer</td><td>0.119</td><td>0.119</td><td>0.4</td><td>0.6</td><td>O K</td></tr><tr><td>7200 min Summer</td><td>0.062</td><td>0.062</td><td>0.4</td><td>0.3</td><td>O K</td></tr><tr><td>8640 min Summer</td><td>0.046</td><td>0.046</td><td>0.3</td><td>0.2</td><td>O K</td></tr><tr><td>10080 min 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Summer</td><td>8.703</td><td>0.0</td><td>408</td></tr><tr><td>960 min Summer</td><td>6.973</td><td>0.0</td><td>532</td></tr><tr><td>1440 min Summer</td><td>5.093</td><td>0.0</td><td>780</td></tr><tr><td>2160 min Summer</td><td>3.711</td><td>0.0</td><td>1144</td></tr><tr><td>2880 min Summer</td><td>2.961</td><td>0.0</td><td>1500</td></tr><tr><td>4320 min Summer</td><td>2.150</td><td>0.0</td><td>2208</td></tr><tr><td>5760 min Summer</td><td>1.711</td><td>0.0</td><td>2944</td></tr><tr><td>7200 min Summer</td><td>1.432</td><td>0.0</td><td>3672</td></tr><tr><td>8640 min Summer</td><td>1.240</td><td>0.0</td><td>4400</td></tr><tr><td>10080 min Summer</td><td>1.098</td><td>0.0</td><td>5136</td></tr><tr><td>15 min Winter</td><td>125.353</td><td>0.0</td><td>17</td></tr></table>						Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status	15 min Summer	1.125	1.125	1.4	6.4	O K	30 min Summer	1.391	1.391	1.6	8.0	O K	60 min Summer	1.556	1.556	1.8	8.9	O K	120 min Summer	1.618	1.618	1.8	9.3	O K	180 min Summer	1.575	1.575	1.8	9.0	O K	240 min Summer	1.504	1.504	1.7	8.6	O K	360 min Summer	1.360	1.360	1.6	7.8	O K	480 min Summer	1.238	1.238	1.5	7.1	O K	600 min Summer	1.134	1.134	1.4	6.5	O K	720 min Summer	1.045	1.045	1.3	6.0	O K	960 min Summer	0.901	0.901	1.2	5.1	O K	1440 min Summer	0.694	0.694	1.0	4.0	O K	2160 min Summer	0.496	0.496	0.8	2.8	O K	2880 min Summer	0.369	0.369	0.6	2.1	O K	4320 min Summer	0.210	0.210	0.5	1.2	O K	5760 min Summer	0.119	0.119	0.4	0.6	O K	7200 min Summer	0.062	0.062	0.4	0.3	O K	8640 min Summer	0.046	0.046	0.3	0.2	O K	10080 min Summer	0.040	0.040	0.3	0.2	O K	15 min Winter	1.267	1.267	1.5	7.3	O K	Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)	15 min Summer	125.353	0.0	17	30 min Summer	84.267	0.0	31	60 min Summer	54.074	0.0	48	120 min Summer	33.506	0.0	82	180 min Summer	24.949	0.0	116	240 min Summer	20.093	0.0	150	360 min Summer	14.773	0.0	216	480 min Summer	11.871	0.0	282	600 min Summer	10.010	0.0	346	720 min Summer	8.703	0.0	408	960 min Summer	6.973	0.0	532	1440 min Summer	5.093	0.0	780	2160 min Summer	3.711	0.0	1144	2880 min Summer	2.961	0.0	1500	4320 min Summer	2.150	0.0	2208	5760 min Summer	1.711	0.0	2944	7200 min Summer	1.432	0.0	3672	8640 min Summer	1.240	0.0	4400	10080 min Summer	1.098	0.0	5136	15 min Winter	125.353	0.0	17
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19 - 21 Silvermills Court		Havant Road, Emsworth			
Henderson Place Lane		SUDs Drainage			
Edinburgh EH3 5DG		Trench Soakaway [TSA] 8			
Date 01/03/2017 15:09		Designed by LK/AC			
File TRENCH SA 8.SRCX		Checked by AMF			
Micro Drainage		Source Control 2015.1			
<u>Summary of Results for 100 year Return Period (+40%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	1.576	1.576	1.8	9.0	O K
60 min Winter	1.768	1.768	1.8	10.1	Flood Risk
120 min Winter	1.845	1.845	1.8	10.4	Flood Risk
180 min Winter	1.725	1.725	1.8	9.9	Flood Risk
240 min Winter	1.603	1.603	1.8	9.2	O K
360 min Winter	1.397	1.397	1.6	8.0	O K
480 min Winter	1.229	1.229	1.5	7.0	O K
600 min Winter	1.091	1.091	1.3	6.2	O K
720 min Winter	0.977	0.977	1.2	5.6	O K
960 min Winter	0.799	0.799	1.1	4.6	O K
1440 min Winter	0.562	0.562	0.8	3.2	O K
2160 min Winter	0.356	0.356	0.6	2.0	O K
2880 min Winter	0.233	0.233	0.5	1.3	O K
4320 min Winter	0.091	0.091	0.4	0.5	O K
5760 min Winter	0.045	0.045	0.3	0.2	O K
7200 min Winter	0.038	0.038	0.3	0.2	O K
8640 min Winter	0.033	0.033	0.2	0.1	O K
10080 min Winter	0.030	0.030	0.2	0.1	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)		
30 min Winter	84.267	0.0	30		
60 min Winter	54.074	0.0	52		
120 min Winter	33.506	0.0	90		
180 min Winter	24.949	0.0	126		
240 min Winter	20.093	0.0	160		
360 min Winter	14.773	0.0	230		
480 min Winter	11.871	0.0	296		
600 min Winter	10.010	0.0	362		
720 min Winter	8.703	0.0	426		
960 min Winter	6.973	0.0	550		
1440 min Winter	5.093	0.0	796		
2160 min Winter	3.711	0.0	1168		
2880 min Winter	2.961	0.0	1528		
4320 min Winter	2.150	0.0	2248		
5760 min Winter	1.711	0.0	2872		
7200 min Winter	1.432	0.0	3592		
8640 min Winter	1.240	0.0	4352		
10080 min Winter	1.098	0.0	5032		
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19 - 21 Silvermills Court Henderson Place Lane Edinburgh EH3 5DG	Havant Road, Emsworth SUDs Drainage Trench Soakaway [TSA] 8	
Date 01/03/2017 15:09 File TRENCH SA 8.SRCX	Designed by LK/AC Checked by AMF	
Micro Drainage Source Control 2015.1		

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.100	Shortest Storm (mins)	15
Ratio R	0.350	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

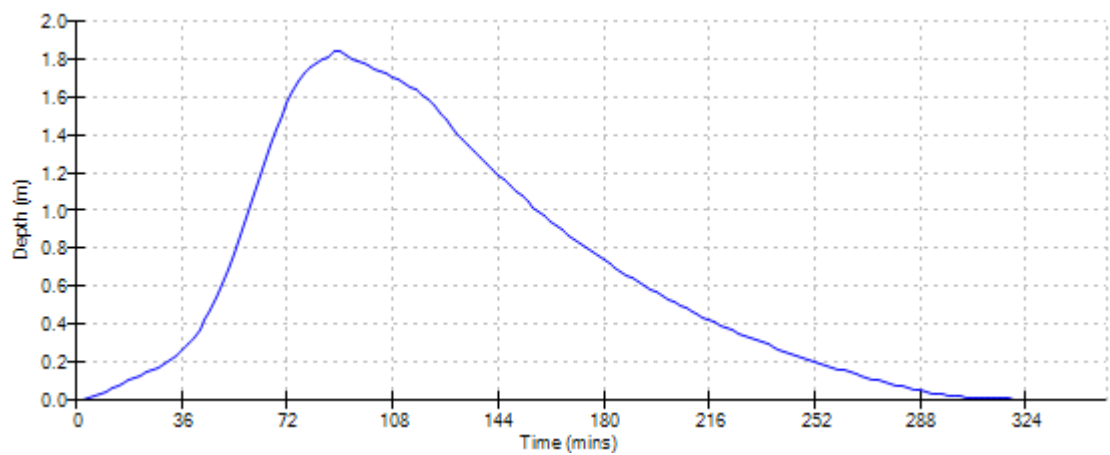
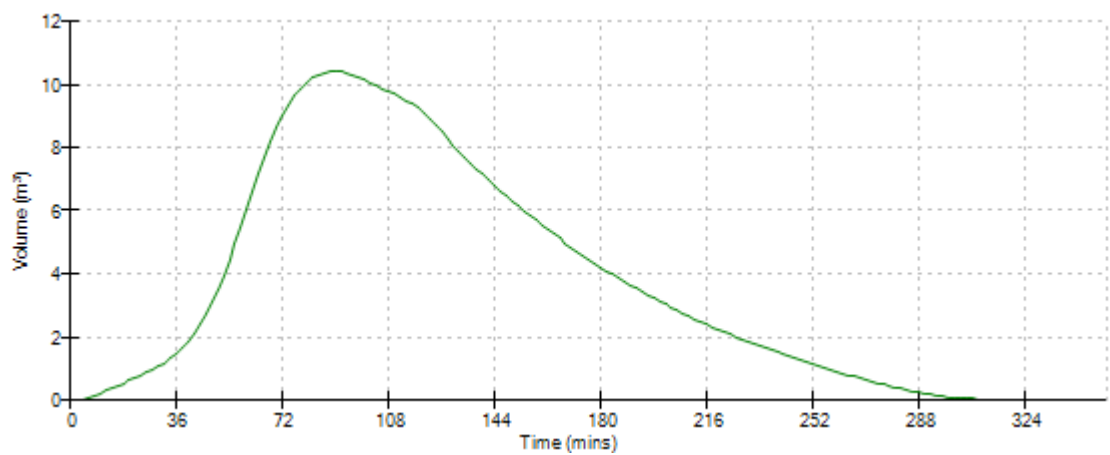
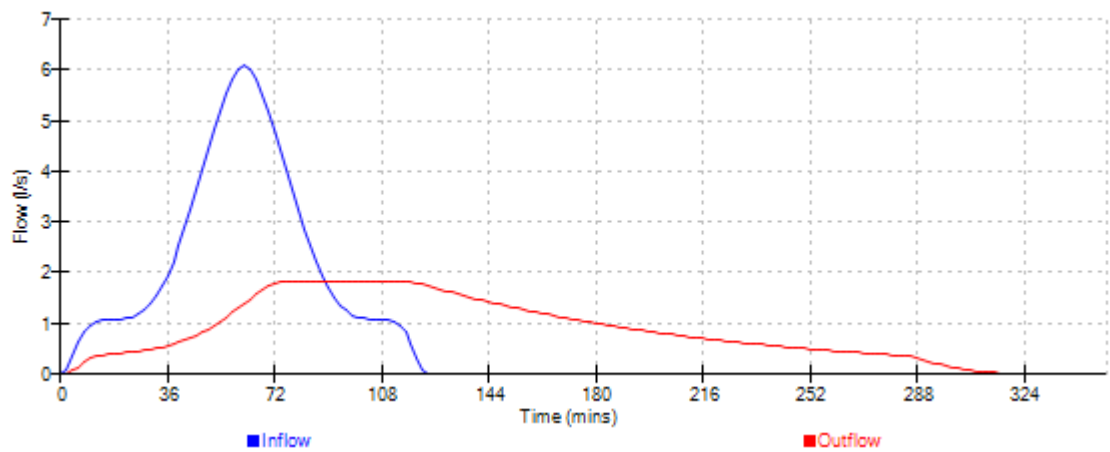
Total Area (ha) 0.031

Time (mins)	Area	Time (mins)	Area
From: To:	(ha)	From: To:	(ha)
0 2	0.016	2 4	0.015

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19 - 21 Silvermills Court Henderson Place Lane Edinburgh EH3 5DG	Havant Road, Emsworth SUDs Drainage Trench Soakaway [TSA] 8																					
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Micro Drainage Source Control 2015.1																						
<u>Model Details</u> Storage is Online Cover Level (m) 2.000 <u>Trench Soakaway Structure</u> <table> <tr> <td>Infiltration Coefficient Base (m/hr)</td> <td>0.11520</td> <td>Trench Width (m)</td> <td>1.2</td> </tr> <tr> <td>Infiltration Coefficient Side (m/hr)</td> <td>0.19800</td> <td>Trench Length (m)</td> <td>16.0</td> </tr> <tr> <td>Safety Factor</td> <td>2.0</td> <td>Slope (1:X)</td> <td>1000.0</td> </tr> <tr> <td>Porosity</td> <td>0.30</td> <td>Cap Volume Depth (m)</td> <td>1.800</td> </tr> <tr> <td>Invert Level (m)</td> <td>0.000</td> <td>Cap Infiltration Depth (m)</td> <td>1.600</td> </tr> </table>			Infiltration Coefficient Base (m/hr)	0.11520	Trench Width (m)	1.2	Infiltration Coefficient Side (m/hr)	0.19800	Trench Length (m)	16.0	Safety Factor	2.0	Slope (1:X)	1000.0	Porosity	0.30	Cap Volume Depth (m)	1.800	Invert Level (m)	0.000	Cap Infiltration Depth (m)	1.600
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Event: 120 min Winter



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<u>Summary of Results for 100 year Return Period (+40%)</u> Half Drain Time : 703 minutes. <table><thead><tr><th>Storm Event</th><th>Max Level (m)</th><th>Max Depth (m)</th><th>Max Infiltration (l/s)</th><th>Max Volume (m³)</th><th>Status</th></tr></thead><tbody><tr><td>15 min Summer</td><td>0.673</td><td>0.673</td><td>0.1</td><td>3.7</td><td>O K</td></tr><tr><td>30 min Summer</td><td>0.895</td><td>0.895</td><td>0.1</td><td>4.9</td><td>O K</td></tr><tr><td>60 min Summer</td><td>1.126</td><td>1.126</td><td>0.1</td><td>6.2</td><td>O K</td></tr><tr><td>120 min Summer</td><td>1.348</td><td>1.348</td><td>0.1</td><td>7.4</td><td>O K</td></tr><tr><td>180 min Summer</td><td>1.455</td><td>1.455</td><td>0.1</td><td>8.0</td><td>O K</td></tr><tr><td>240 min Summer</td><td>1.512</td><td>1.512</td><td>0.1</td><td>8.3</td><td>O K</td></tr><tr><td>360 min Summer</td><td>1.563</td><td>1.563</td><td>0.1</td><td>8.6</td><td>O K</td></tr><tr><td>480 min Summer</td><td>1.575</td><td>1.575</td><td>0.1</td><td>8.7</td><td>O K</td></tr><tr><td>600 min Summer</td><td>1.576</td><td>1.576</td><td>0.1</td><td>8.7</td><td>O K</td></tr><tr><td>720 min Summer</td><td>1.573</td><td>1.573</td><td>0.1</td><td>8.7</td><td>O K</td></tr><tr><td>960 min Summer</td><td>1.556</td><td>1.556</td><td>0.1</td><td>8.6</td><td>O K</td></tr><tr><td>1440 min Summer</td><td>1.498</td><td>1.498</td><td>0.1</td><td>8.2</td><td>O K</td></tr><tr><td>2160 min Summer</td><td>1.394</td><td>1.394</td><td>0.1</td><td>7.7</td><td>O K</td></tr><tr><td>2880 min Summer</td><td>1.298</td><td>1.298</td><td>0.1</td><td>7.1</td><td>O K</td></tr><tr><td>4320 min Summer</td><td>1.134</td><td>1.134</td><td>0.1</td><td>6.2</td><td>O K</td></tr><tr><td>5760 min Summer</td><td>0.995</td><td>0.995</td><td>0.1</td><td>5.5</td><td>O K</td></tr><tr><td>7200 min Summer</td><td>0.876</td><td>0.876</td><td>0.1</td><td>4.8</td><td>O K</td></tr><tr><td>8640 min Summer</td><td>0.776</td><td>0.776</td><td>0.1</td><td>4.3</td><td>O K</td></tr><tr><td>10080 min Summer</td><td>0.690</td><td>0.690</td><td>0.1</td><td>3.8</td><td>O K</td></tr><tr><td>15 min Winter</td><td>0.755</td><td>0.755</td><td>0.1</td><td>4.1</td><td>O K</td></tr></tbody></table> <table><thead><tr><th>Storm Event</th><th>Rain (mm/hr)</th><th>Flooded Volume (m³)</th><th>Time-Peak (mins)</th></tr></thead><tbody><tr><td>15 min Summer</td><td>125.353</td><td>0.0</td><td>19</td></tr><tr><td>30 min Summer</td><td>84.267</td><td>0.0</td><td>34</td></tr><tr><td>60 min Summer</td><td>54.074</td><td>0.0</td><td>64</td></tr><tr><td>120 min Summer</td><td>33.506</td><td>0.0</td><td>122</td></tr><tr><td>180 min Summer</td><td>24.949</td><td>0.0</td><td>182</td></tr><tr><td>240 min Summer</td><td>20.093</td><td>0.0</td><td>242</td></tr><tr><td>360 min Summer</td><td>14.773</td><td>0.0</td><td>360</td></tr><tr><td>480 min Summer</td><td>11.871</td><td>0.0</td><td>450</td></tr><tr><td>600 min Summer</td><td>10.010</td><td>0.0</td><td>504</td></tr><tr><td>720 min Summer</td><td>8.703</td><td>0.0</td><td>568</td></tr><tr><td>960 min Summer</td><td>6.973</td><td>0.0</td><td>694</td></tr><tr><td>1440 min Summer</td><td>5.093</td><td>0.0</td><td>968</td></tr><tr><td>2160 min Summer</td><td>3.711</td><td>0.0</td><td>1384</td></tr><tr><td>2880 min Summer</td><td>2.961</td><td>0.0</td><td>1792</td></tr><tr><td>4320 min Summer</td><td>2.150</td><td>0.0</td><td>2596</td></tr><tr><td>5760 min Summer</td><td>1.711</td><td>0.0</td><td>3400</td></tr><tr><td>7200 min Summer</td><td>1.432</td><td>0.0</td><td>4176</td></tr><tr><td>8640 min Summer</td><td>1.240</td><td>0.0</td><td>4920</td></tr><tr><td>10080 min Summer</td><td>1.098</td><td>0.0</td><td>5648</td></tr><tr><td>15 min Winter</td><td>125.353</td><td>0.0</td><td>19</td></tr></tbody></table>						Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status	15 min Summer	0.673	0.673	0.1	3.7	O K	30 min Summer	0.895	0.895	0.1	4.9	O K	60 min Summer	1.126	1.126	0.1	6.2	O K	120 min Summer	1.348	1.348	0.1	7.4	O K	180 min Summer	1.455	1.455	0.1	8.0	O K	240 min Summer	1.512	1.512	0.1	8.3	O K	360 min Summer	1.563	1.563	0.1	8.6	O K	480 min Summer	1.575	1.575	0.1	8.7	O K	600 min Summer	1.576	1.576	0.1	8.7	O K	720 min Summer	1.573	1.573	0.1	8.7	O K	960 min Summer	1.556	1.556	0.1	8.6	O K	1440 min Summer	1.498	1.498	0.1	8.2	O K	2160 min Summer	1.394	1.394	0.1	7.7	O K	2880 min Summer	1.298	1.298	0.1	7.1	O K	4320 min Summer	1.134	1.134	0.1	6.2	O K	5760 min Summer	0.995	0.995	0.1	5.5	O K	7200 min Summer	0.876	0.876	0.1	4.8	O K	8640 min Summer	0.776	0.776	0.1	4.3	O K	10080 min Summer	0.690	0.690	0.1	3.8	O K	15 min Winter	0.755	0.755	0.1	4.1	O K	Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)	15 min Summer	125.353	0.0	19	30 min Summer	84.267	0.0	34	60 min Summer	54.074	0.0	64	120 min Summer	33.506	0.0	122	180 min Summer	24.949	0.0	182	240 min Summer	20.093	0.0	242	360 min Summer	14.773	0.0	360	480 min Summer	11.871	0.0	450	600 min Summer	10.010	0.0	504	720 min Summer	8.703	0.0	568	960 min Summer	6.973	0.0	694	1440 min Summer	5.093	0.0	968	2160 min Summer	3.711	0.0	1384	2880 min Summer	2.961	0.0	1792	4320 min Summer	2.150	0.0	2596	5760 min Summer	1.711	0.0	3400	7200 min Summer	1.432	0.0	4176	8640 min Summer	1.240	0.0	4920	10080 min Summer	1.098	0.0	5648	15 min Winter	125.353	0.0	19
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19 - 21 Silvermills Court Henderson Place Lane Edinburgh EH3 5DG			Havant Road, Emsworth SUDs Drainage Trench Soakaway [TSA] 9			
Date 01/03/2017 16:01 File TRENCH SA 9.SRCX			Designed by LK/AC Checked by AMF			
Micro Drainage			Source Control 2015.1			
Summary of Results for 100 year Return Period (+40%)						
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status	
30 min Winter	1.005	1.005	0.1	5.5	O K	
60 min Winter	1.266	1.266	0.1	7.0	O K	
120 min Winter	1.519	1.519	0.1	8.4	O K	
180 min Winter	1.645	1.645	0.1	9.1	O K	
240 min Winter	1.715	1.715	0.1	9.4	Flood Risk	
360 min Winter	1.790	1.790	0.1	9.9	Flood Risk	
480 min Winter	1.882	1.882	0.1	10.0	Flood Risk	
600 min Winter	1.897	1.897	0.1	10.0	Flood Risk	
720 min Winter	1.827	1.827	0.1	10.0	Flood Risk	
960 min Winter	1.785	1.785	0.1	9.8	Flood Risk	
1440 min Winter	1.700	1.700	0.1	9.4	Flood Risk	
2160 min Winter	1.548	1.548	0.1	8.5	O K	
2880 min Winter	1.405	1.405	0.1	7.7	O K	
4320 min Winter	1.170	1.170	0.1	6.4	O K	
5760 min Winter	0.980	0.980	0.1	5.4	O K	
7200 min Winter	0.823	0.823	0.1	4.5	O K	
8640 min Winter	0.694	0.694	0.1	3.8	O K	
10080 min Winter	0.586	0.586	0.1	3.2	O K	
Storm Event	Rain (mm/hr)		Flooded Volume (m³)	Time-Peak (mins)		
30 min Winter	84.267		0.0	33		
60 min Winter	54.074		0.0	62		
120 min Winter	33.506		0.0	120		
180 min Winter	24.949		0.0	178		
240 min Winter	20.093		0.0	236		
360 min Winter	14.773		0.0	350		
480 min Winter	11.871		0.0	460		
600 min Winter	10.010		0.0	566		
720 min Winter	8.703		0.0	658		
960 min Winter	6.973		0.0	742		
1440 min Winter	5.093		0.0	1052		
2160 min Winter	3.711		0.0	1492		
2880 min Winter	2.961		0.0	1932		
4320 min Winter	2.150		0.0	2768		
5760 min Winter	1.711		0.0	3576		
7200 min Winter	1.432		0.0	4328		
8640 min Winter	1.240		0.0	5104		
10080 min Winter	1.098		0.0	5856		
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19 - 21 Silvermills Court Henderson Place Lane Edinburgh EH3 5DG	Havant Road, Emsworth SUDs Drainage Trench Soakaway [TSA] 9	
Date 01/03/2017 16:01 File TRENCH SA 9.SRCX	Designed by LK/AC Checked by AMF	
Micro Drainage	Source Control 2015.1	

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.100	Shortest Storm (mins)	15
Ratio R	0.350	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

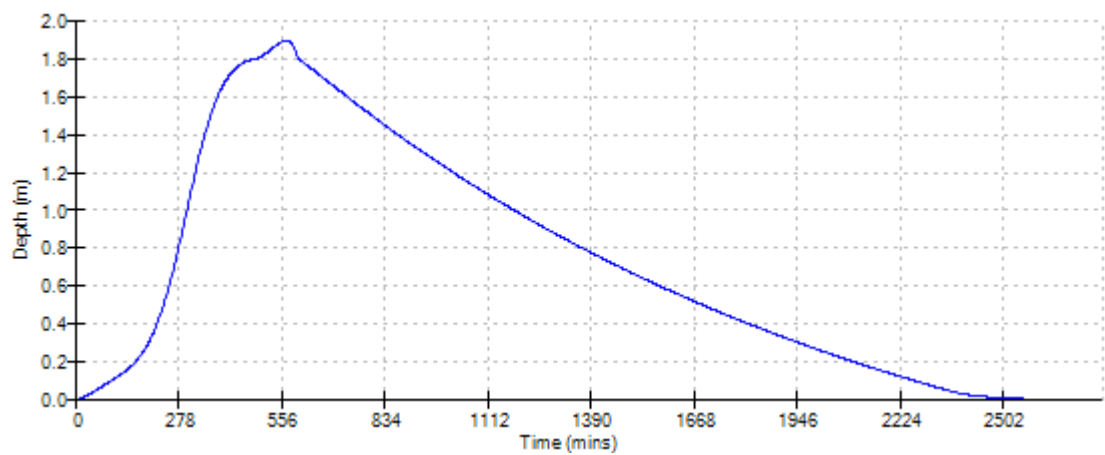
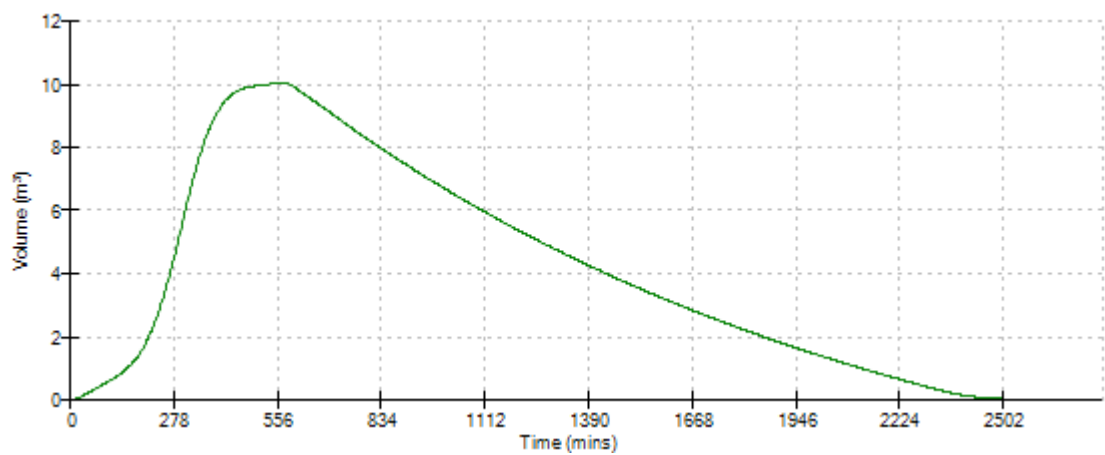
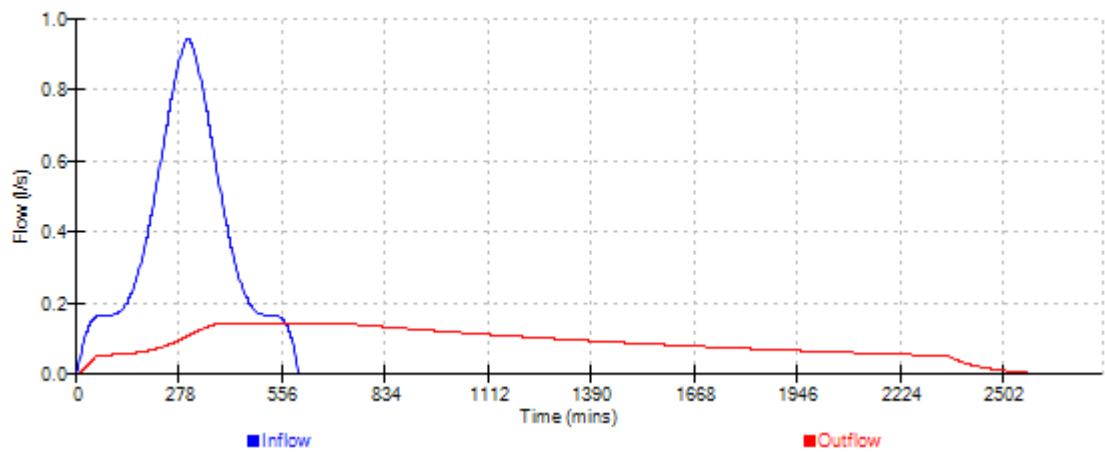
Time Area Diagram

Total Area (ha) 0.016

Time (mins)	Area	Time (mins)	Area
From: To:	(ha)	From: To:	(ha)
0 2	0.008	2 4	0.008

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19 - 21 Silvermills Court Henderson Place Lane Edinburgh EH3 5DG	Havant Road, Emsworth SUDs Drainage Trench Soakaway [TSA] 9																					
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<u>Model Details</u> Storage is Online Cover Level (m) 2.000 <u>Trench Soakaway Structure</u> <table> <tr> <td>Infiltration Coefficient Base (m/hr)</td> <td>0.01872</td> <td>Trench Width (m)</td> <td>2.0</td> </tr> <tr> <td>Infiltration Coefficient Side (m/hr)</td> <td>0.01872</td> <td>Trench Length (m)</td> <td>9.2</td> </tr> <tr> <td>Safety Factor</td> <td>2.0</td> <td>Slope (1:X)</td> <td>1000.0</td> </tr> <tr> <td>Porosity</td> <td>0.30</td> <td>Cap Volume Depth (m)</td> <td>1.800</td> </tr> <tr> <td>Invert Level (m)</td> <td>0.000</td> <td>Cap Infiltration Depth (m)</td> <td>1.600</td> </tr> </table>			Infiltration Coefficient Base (m/hr)	0.01872	Trench Width (m)	2.0	Infiltration Coefficient Side (m/hr)	0.01872	Trench Length (m)	9.2	Safety Factor	2.0	Slope (1:X)	1000.0	Porosity	0.30	Cap Volume Depth (m)	1.800	Invert Level (m)	0.000	Cap Infiltration Depth (m)	1.600
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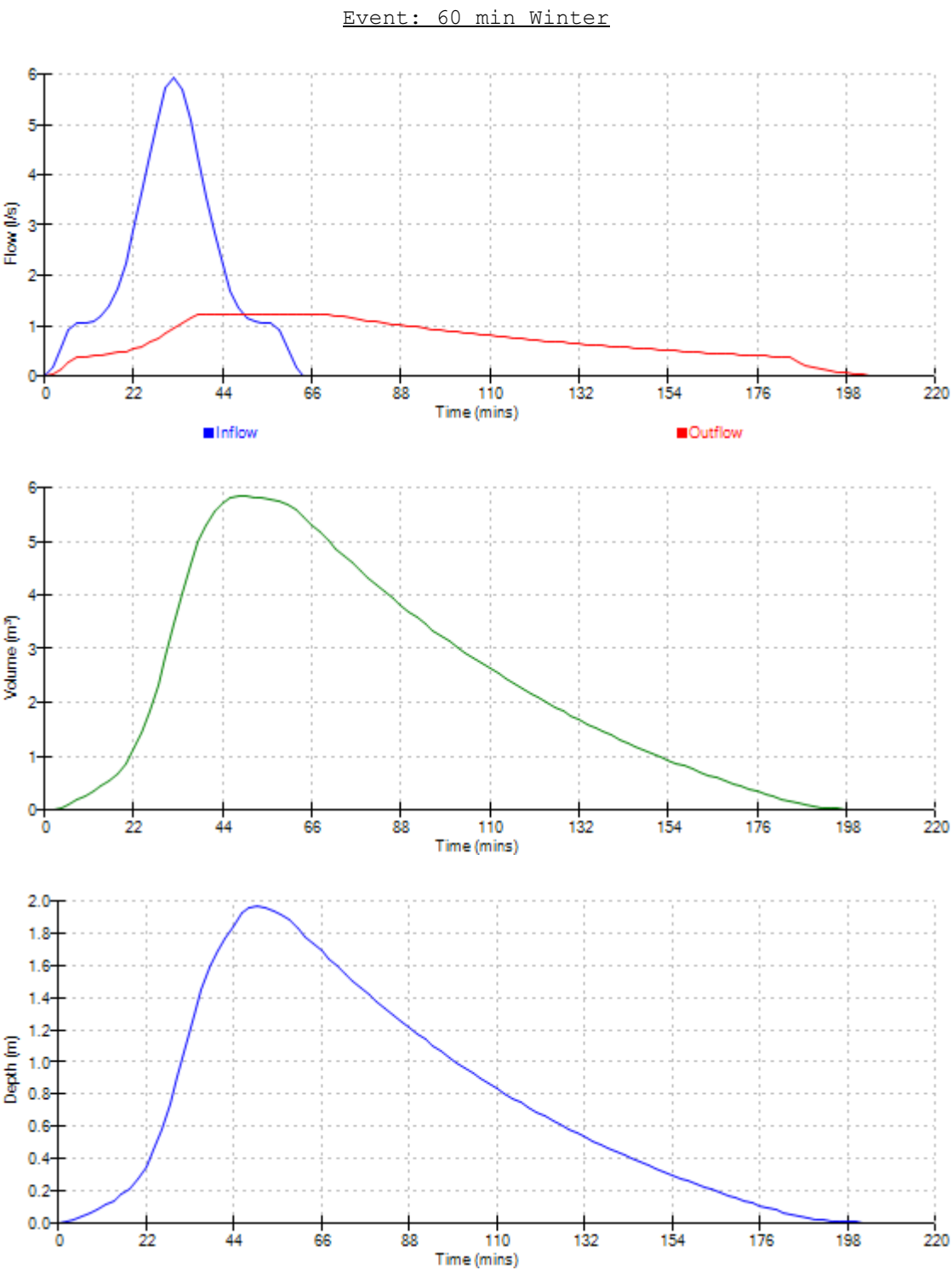
Event: 600 min Winter



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Summer</td><td>1.127</td><td>1.127</td><td>1.0</td><td>3.5</td><td>O K</td></tr><tr><td>600 min Summer</td><td>1.005</td><td>1.005</td><td>0.9</td><td>3.2</td><td>O K</td></tr><tr><td>720 min Summer</td><td>0.901</td><td>0.901</td><td>0.8</td><td>2.8</td><td>O K</td></tr><tr><td>960 min Summer</td><td>0.732</td><td>0.732</td><td>0.7</td><td>2.3</td><td>O K</td></tr><tr><td>1440 min Summer</td><td>0.495</td><td>0.495</td><td>0.6</td><td>1.5</td><td>O K</td></tr><tr><td>2160 min Summer</td><td>0.277</td><td>0.277</td><td>0.5</td><td>0.9</td><td>O K</td></tr><tr><td>2880 min Summer</td><td>0.143</td><td>0.143</td><td>0.4</td><td>0.4</td><td>O K</td></tr><tr><td>4320 min Summer</td><td>0.046</td><td>0.046</td><td>0.3</td><td>0.1</td><td>O K</td></tr><tr><td>5760 min Summer</td><td>0.036</td><td>0.036</td><td>0.3</td><td>0.1</td><td>O K</td></tr><tr><td>7200 min Summer</td><td>0.031</td><td>0.031</td><td>0.2</td><td>0.1</td><td>O K</td></tr><tr><td>8640 min Summer</td><td>0.027</td><td>0.027</td><td>0.2</td><td>0.1</td><td>O K</td></tr><tr><td>10080 min Summer</td><td>0.024</td><td>0.024</td><td>0.2</td><td>0.1</td><td>O K</td></tr><tr><td>15 min Winter</td><td>1.368</td><td>1.368</td><td>1.1</td><td>4.3</td><td>O K</td></tr></tbody></table> <table><thead><tr><th>Storm Event</th><th>Rain (mm/hr)</th><th>Flooded Volume (m³)</th><th>Time-Peak (mins)</th></tr></thead><tbody><tr><td>15 min Summer</td><td>125.353</td><td>0.0</td><td>17</td></tr><tr><td>30 min Summer</td><td>84.267</td><td>0.0</td><td>30</td></tr><tr><td>60 min Summer</td><td>54.074</td><td>0.0</td><td>46</td></tr><tr><td>120 min Summer</td><td>33.506</td><td>0.0</td><td>80</td></tr><tr><td>180 min Summer</td><td>24.949</td><td>0.0</td><td>114</td></tr><tr><td>240 min Summer</td><td>20.093</td><td>0.0</td><td>148</td></tr><tr><td>360 min Summer</td><td>14.773</td><td>0.0</td><td>214</td></tr><tr><td>480 min Summer</td><td>11.871</td><td>0.0</td><td>278</td></tr><tr><td>600 min Summer</td><td>10.010</td><td>0.0</td><td>342</td></tr><tr><td>720 min Summer</td><td>8.703</td><td>0.0</td><td>404</td></tr><tr><td>960 min Summer</td><td>6.973</td><td>0.0</td><td>528</td></tr><tr><td>1440 min Summer</td><td>5.093</td><td>0.0</td><td>768</td></tr><tr><td>2160 min Summer</td><td>3.711</td><td>0.0</td><td>1128</td></tr><tr><td>2880 min Summer</td><td>2.961</td><td>0.0</td><td>1496</td></tr><tr><td>4320 min Summer</td><td>2.150</td><td>0.0</td><td>2148</td></tr><tr><td>5760 min Summer</td><td>1.711</td><td>0.0</td><td>2936</td></tr><tr><td>7200 min Summer</td><td>1.432</td><td>0.0</td><td>3608</td></tr><tr><td>8640 min Summer</td><td>1.240</td><td>0.0</td><td>4384</td></tr><tr><td>10080 min Summer</td><td>1.098</td><td>0.0</td><td>4984</td></tr><tr><td>15 min Winter</td><td>125.353</td><td>0.0</td><td>17</td></tr></tbody></table>						Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status	15 min Summer	1.209	1.209	1.0	3.8	O K	30 min Summer	1.472	1.472	1.2	4.6	O K	60 min Summer	1.620	1.620	1.2	5.1	O K	120 min Summer	1.632	1.632	1.2	5.1	O K	180 min Summer	1.546	1.546	1.2	4.9	O K	240 min Summer	1.446	1.446	1.1	4.5	O K	360 min Summer	1.272	1.272	1.0	4.0	O K	480 min Summer	1.127	1.127	1.0	3.5	O K	600 min Summer	1.005	1.005	0.9	3.2	O K	720 min Summer	0.901	0.901	0.8	2.8	O K	960 min Summer	0.732	0.732	0.7	2.3	O K	1440 min Summer	0.495	0.495	0.6	1.5	O K	2160 min Summer	0.277	0.277	0.5	0.9	O K	2880 min Summer	0.143	0.143	0.4	0.4	O K	4320 min Summer	0.046	0.046	0.3	0.1	O K	5760 min Summer	0.036	0.036	0.3	0.1	O K	7200 min Summer	0.031	0.031	0.2	0.1	O K	8640 min Summer	0.027	0.027	0.2	0.1	O K	10080 min Summer	0.024	0.024	0.2	0.1	O K	15 min Winter	1.368	1.368	1.1	4.3	O K	Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)	15 min Summer	125.353	0.0	17	30 min Summer	84.267	0.0	30	60 min Summer	54.074	0.0	46	120 min Summer	33.506	0.0	80	180 min Summer	24.949	0.0	114	240 min Summer	20.093	0.0	148	360 min Summer	14.773	0.0	214	480 min Summer	11.871	0.0	278	600 min Summer	10.010	0.0	342	720 min Summer	8.703	0.0	404	960 min Summer	6.973	0.0	528	1440 min Summer	5.093	0.0	768	2160 min Summer	3.711	0.0	1128	2880 min Summer	2.961	0.0	1496	4320 min Summer	2.150	0.0	2148	5760 min Summer	1.711	0.0	2936	7200 min Summer	1.432	0.0	3608	8640 min Summer	1.240	0.0	4384	10080 min Summer	1.098	0.0	4984	15 min Winter	125.353	0.0	17
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19 - 21 Silvermills Court		Havant Road, Emsworth			
Henderson Place Lane		SUDs Drainage			
Edinburgh EH3 5DG		Trench Soakaway [TSA] 10			
Date 01/03/2017 15:41		Designed by LK/AC			
File TRENCH SA 10.SRCX		Checked by AMF			
Micro Drainage		Source Control 2015.1			
<u>Summary of Results for 100 year Return Period (+40%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	1.681	1.681	1.2	5.3	O K
60 min Winter	1.966	1.966	1.2	5.8	Flood Risk
120 min Winter	1.913	1.913	1.2	5.8	Flood Risk
180 min Winter	1.688	1.688	1.2	5.3	O K
240 min Winter	1.530	1.530	1.2	4.8	O K
360 min Winter	1.280	1.280	1.0	4.0	O K
480 min Winter	1.084	1.084	0.9	3.4	O K
600 min Winter	0.925	0.925	0.9	2.9	O K
720 min Winter	0.794	0.794	0.8	2.5	O K
960 min Winter	0.592	0.592	0.7	1.9	O K
1440 min Winter	0.330	0.330	0.5	1.0	O K
2160 min Winter	0.111	0.111	0.4	0.3	O K
2880 min Winter	0.045	0.045	0.3	0.1	O K
4320 min Winter	0.033	0.033	0.2	0.1	O K
5760 min Winter	0.026	0.026	0.2	0.1	O K
7200 min Winter	0.022	0.022	0.2	0.1	O K
8640 min Winter	0.019	0.019	0.1	0.0	O K
10080 min Winter	0.017	0.017	0.1	0.0	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)		
30 min Winter	84.267	0.0	30		
60 min Winter	54.074	0.0	50		
120 min Winter	33.506	0.0	88		
180 min Winter	24.949	0.0	124		
240 min Winter	20.093	0.0	158		
360 min Winter	14.773	0.0	226		
480 min Winter	11.871	0.0	292		
600 min Winter	10.010	0.0	356		
720 min Winter	8.703	0.0	420		
960 min Winter	6.973	0.0	546		
1440 min Winter	5.093	0.0	792		
2160 min Winter	3.711	0.0	1144		
2880 min Winter	2.961	0.0	1468		
4320 min Winter	2.150	0.0	2144		
5760 min Winter	1.711	0.0	2936		
7200 min Winter	1.432	0.0	3576		
8640 min Winter	1.240	0.0	4368		
10080 min Winter	1.098	0.0	4952		
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19 - 21 Silvermills Court Henderson Place Lane Edinburgh EH3 5DG	Havant Road, Emsworth SUDs Drainage Trench Soakaway [TSA] 10																					
Date 01/03/2017 15:41 File TRENCH SA 10.SRCX	Designed by LK/AC Checked by AMF																					
Micro Drainage Source Control 2015.1																						
<u>Model Details</u> Storage is Online Cover Level (m) 2.000 <u>Trench Soakaway Structure</u> <table> <tr> <td>Infiltration Coefficient Base (m/hr)</td> <td>0.23400</td> <td>Trench Width (m)</td> <td>1.5</td> </tr> <tr> <td>Infiltration Coefficient Side (m/hr)</td> <td>0.23400</td> <td>Trench Length (m)</td> <td>7.0</td> </tr> <tr> <td>Safety Factor</td> <td>2.0</td> <td>Slope (1:X)</td> <td>1000.0</td> </tr> <tr> <td>Porosity</td> <td>0.30</td> <td>Cap Volume Depth (m)</td> <td>1.800</td> </tr> <tr> <td>Invert Level (m)</td> <td>0.000</td> <td>Cap Infiltration Depth (m)</td> <td>1.600</td> </tr> </table>			Infiltration Coefficient Base (m/hr)	0.23400	Trench Width (m)	1.5	Infiltration Coefficient Side (m/hr)	0.23400	Trench Length (m)	7.0	Safety Factor	2.0	Slope (1:X)	1000.0	Porosity	0.30	Cap Volume Depth (m)	1.800	Invert Level (m)	0.000	Cap Infiltration Depth (m)	1.600
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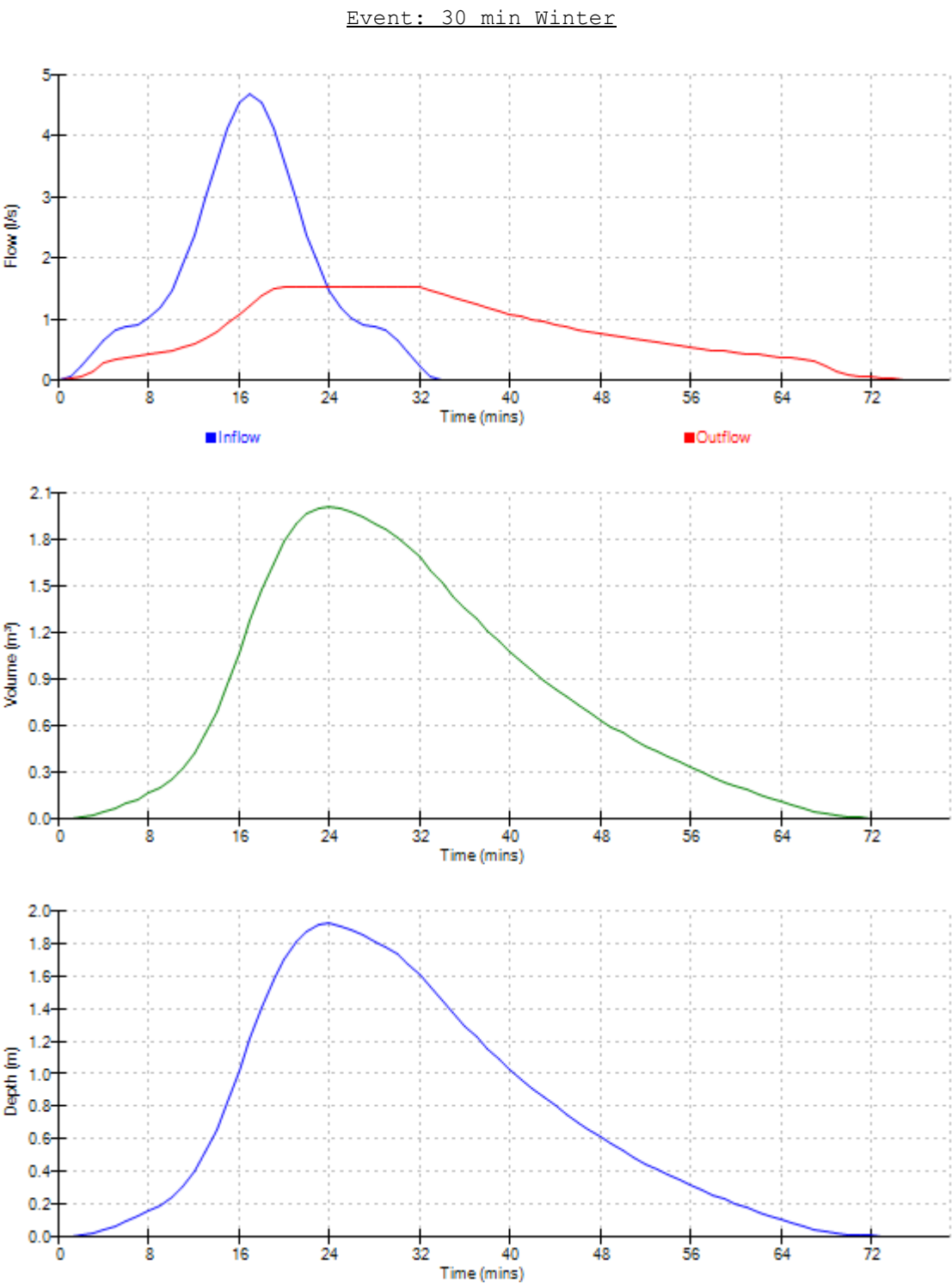


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Henderson Place Lane		SUDs Drainage			
Edinburgh EH3 5DG		Trench Soakaway [TSA] 11			
Date 01/03/2017 15:30		Designed by LK/AC			
File TRENCH SA 11.SRCX		Checked by AMF			
Micro Drainage		Source Control 2015.1			
<u>Summary of Results for 100 year Return Period (+40%)</u> Half Drain Time : 16 minutes.					
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	1.508	1.508	1.4	1.6	O K
30 min Summer	1.703	1.703	1.5	1.8	Flood Risk
60 min Summer	1.678	1.678	1.5	1.8	O K
120 min Summer	1.442	1.442	1.4	1.5	O K
180 min Summer	1.229	1.229	1.2	1.3	O K
240 min Summer	1.059	1.059	1.1	1.1	O K
360 min Summer	0.812	0.812	0.9	0.9	O K
480 min Summer	0.645	0.645	0.8	0.7	O K
600 min Summer	0.522	0.522	0.7	0.5	O K
720 min Summer	0.428	0.428	0.6	0.4	O K
960 min Summer	0.292	0.292	0.5	0.3	O K
1440 min Summer	0.134	0.134	0.4	0.1	O K
2160 min Summer	0.046	0.046	0.3	0.0	O K
2880 min Summer	0.036	0.036	0.2	0.0	O K
4320 min Summer	0.027	0.027	0.2	0.0	O K
5760 min Summer	0.021	0.021	0.1	0.0	O K
7200 min Summer	0.018	0.018	0.1	0.0	O K
8640 min Summer	0.016	0.016	0.1	0.0	O K
10080 min Summer	0.014	0.014	0.1	0.0	O K
15 min Winter	1.709	1.709	1.5	1.8	Flood Risk
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)		
15 min Summer	125.353	0.0	14		
30 min Summer	84.267	0.0	22		
60 min Summer	54.074	0.0	40		
120 min Summer	33.506	0.0	72		
180 min Summer	24.949	0.0	102		
240 min Summer	20.093	0.0	134		
360 min Summer	14.773	0.0	194		
480 min Summer	11.871	0.0	256		
600 min Summer	10.010	0.0	316		
720 min Summer	8.703	0.0	376		
960 min Summer	6.973	0.0	498		
1440 min Summer	5.093	0.0	736		
2160 min Summer	3.711	0.0	1096		
2880 min Summer	2.961	0.0	1440		
4320 min Summer	2.150	0.0	2140		
5760 min Summer	1.711	0.0	2920		
7200 min Summer	1.432	0.0	3584		
8640 min Summer	1.240	0.0	4328		
10080 min Summer	1.098	0.0	4992		
15 min Winter	125.353	0.0	14		
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19 - 21 Silvermills Court		Havant Road, Emsworth			
Henderson Place Lane		SUDs Drainage			
Edinburgh EH3 5DG		Trench Soakaway [TSA] 11			
Date 01/03/2017 15:30		Designed by LK/AC			
File TRENCH SA 11.SRCX		Checked by AMF			
Micro Drainage		Source Control 2015.1			
<u>Summary of Results for 100 year Return Period (+40%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	1.921	1.921	1.5	2.0	Flood Risk
60 min Winter	1.808	1.808	1.5	1.9	Flood Risk
120 min Winter	1.413	1.413	1.4	1.5	O K
180 min Winter	1.132	1.132	1.2	1.2	O K
240 min Winter	0.922	0.922	1.0	1.0	O K
360 min Winter	0.644	0.644	0.8	0.7	O K
480 min Winter	0.470	0.470	0.7	0.5	O K
600 min Winter	0.349	0.349	0.6	0.4	O K
720 min Winter	0.261	0.261	0.5	0.3	O K
960 min Winter	0.139	0.139	0.4	0.1	O K
1440 min Winter	0.045	0.045	0.3	0.0	O K
2160 min Winter	0.033	0.033	0.2	0.0	O K
2880 min Winter	0.026	0.026	0.2	0.0	O K
4320 min Winter	0.019	0.019	0.1	0.0	O K
5760 min Winter	0.015	0.015	0.1	0.0	O K
7200 min Winter	0.013	0.013	0.1	0.0	O K
8640 min Winter	0.011	0.011	0.1	0.0	O K
10080 min Winter	0.010	0.010	0.1	0.0	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)		
30 min Winter	84.267	0.0	24		
60 min Winter	54.074	0.0	42		
120 min Winter	33.506	0.0	74		
180 min Winter	24.949	0.0	106		
240 min Winter	20.093	0.0	138		
360 min Winter	14.773	0.0	200		
480 min Winter	11.871	0.0	260		
600 min Winter	10.010	0.0	320		
720 min Winter	8.703	0.0	382		
960 min Winter	6.973	0.0	500		
1440 min Winter	5.093	0.0	714		
2160 min Winter	3.711	0.0	1076		
2880 min Winter	2.961	0.0	1444		
4320 min Winter	2.150	0.0	2140		
5760 min Winter	1.711	0.0	2808		
7200 min Winter	1.432	0.0	3576		
8640 min Winter	1.240	0.0	4336		
10080 min Winter	1.098	0.0	4984		
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19 - 21 Silvermills Court Henderson Place Lane Edinburgh EH3 5DG	Havant Road, Emsworth SUDs Drainage Trench Soakaway [TSA] 11																																					
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Micro Drainage Source Control 2015.1																						
<u>Model Details</u> Storage is Online Cover Level (m) 2.000 <u>Trench Soakaway Structure</u> <table> <tr> <td>Infiltration Coefficient Base (m/hr)</td> <td>0.61200</td> <td>Trench Width (m)</td> <td>1.0</td> </tr> <tr> <td>Infiltration Coefficient Side (m/hr)</td> <td>0.61200</td> <td>Trench Length (m)</td> <td>3.5</td> </tr> <tr> <td>Safety Factor</td> <td>2.0</td> <td>Slope (1:X)</td> <td>1000.0</td> </tr> <tr> <td>Porosity</td> <td>0.30</td> <td>Cap Volume Depth (m)</td> <td>1.800</td> </tr> <tr> <td>Invert Level (m)</td> <td>0.000</td> <td>Cap Infiltration Depth (m)</td> <td>1.600</td> </tr> </table>			Infiltration Coefficient Base (m/hr)	0.61200	Trench Width (m)	1.0	Infiltration Coefficient Side (m/hr)	0.61200	Trench Length (m)	3.5	Safety Factor	2.0	Slope (1:X)	1000.0	Porosity	0.30	Cap Volume Depth (m)	1.800	Invert Level (m)	0.000	Cap Infiltration Depth (m)	1.600
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K</td></tr><tr><td>600 min Summer</td><td>0.519</td><td>0.519</td><td>1.3</td><td>1.1</td><td>O K</td></tr><tr><td>720 min Summer</td><td>0.423</td><td>0.423</td><td>1.2</td><td>0.9</td><td>O K</td></tr><tr><td>960 min Summer</td><td>0.284</td><td>0.284</td><td>1.0</td><td>0.6</td><td>O K</td></tr><tr><td>1440 min Summer</td><td>0.121</td><td>0.121</td><td>0.8</td><td>0.2</td><td>O K</td></tr><tr><td>2160 min Summer</td><td>0.044</td><td>0.044</td><td>0.6</td><td>0.1</td><td>O K</td></tr><tr><td>2880 min Summer</td><td>0.035</td><td>0.035</td><td>0.5</td><td>0.1</td><td>O K</td></tr><tr><td>4320 min Summer</td><td>0.026</td><td>0.026</td><td>0.3</td><td>0.0</td><td>O K</td></tr><tr><td>5760 min Summer</td><td>0.021</td><td>0.021</td><td>0.3</td><td>0.0</td><td>O K</td></tr><tr><td>7200 min Summer</td><td>0.017</td><td>0.017</td><td>0.2</td><td>0.0</td><td>O K</td></tr><tr><td>8640 min Summer</td><td>0.015</td><td>0.015</td><td>0.2</td><td>0.0</td><td>O K</td></tr><tr><td>10080 min 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Summer</td><td>8.703</td><td>0.0</td><td>376</td></tr><tr><td>960 min Summer</td><td>6.973</td><td>0.0</td><td>500</td></tr><tr><td>1440 min Summer</td><td>5.093</td><td>0.0</td><td>736</td></tr><tr><td>2160 min Summer</td><td>3.711</td><td>0.0</td><td>1100</td></tr><tr><td>2880 min Summer</td><td>2.961</td><td>0.0</td><td>1468</td></tr><tr><td>4320 min Summer</td><td>2.150</td><td>0.0</td><td>2200</td></tr><tr><td>5760 min Summer</td><td>1.711</td><td>0.0</td><td>2856</td></tr><tr><td>7200 min Summer</td><td>1.432</td><td>0.0</td><td>3544</td></tr><tr><td>8640 min Summer</td><td>1.240</td><td>0.0</td><td>4336</td></tr><tr><td>10080 min Summer</td><td>1.098</td><td>0.0</td><td>5024</td></tr><tr><td>15 min Winter</td><td>125.353</td><td>0.0</td><td>15</td></tr></table>						Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status	15 min Summer	1.459	1.459	2.6	3.1	O K	30 min Summer	1.649	1.649	2.8	3.5	O K	60 min Summer	1.642	1.642	2.8	3.4	O K	120 min Summer	1.427	1.427	2.5	3.0	O K	180 min Summer	1.224	1.224	2.3	2.6	O K	240 min Summer	1.057	1.057	2.0	2.2	O K	360 min Summer	0.812	0.812	1.7	1.7	O K	480 min Summer	0.644	0.644	1.5	1.3	O K	600 min Summer	0.519	0.519	1.3	1.1	O K	720 min Summer	0.423	0.423	1.2	0.9	O K	960 min Summer	0.284	0.284	1.0	0.6	O K	1440 min Summer	0.121	0.121	0.8	0.2	O K	2160 min Summer	0.044	0.044	0.6	0.1	O K	2880 min Summer	0.035	0.035	0.5	0.1	O K	4320 min Summer	0.026	0.026	0.3	0.0	O K	5760 min Summer	0.021	0.021	0.3	0.0	O K	7200 min Summer	0.017	0.017	0.2	0.0	O K	8640 min Summer	0.015	0.015	0.2	0.0	O K	10080 min Summer	0.014	0.014	0.2	0.0	O K	15 min Winter	1.652	1.652	2.8	3.5	O K	Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)	15 min Summer	125.353	0.0	14	30 min Summer	84.267	0.0	22	60 min Summer	54.074	0.0	40	120 min Summer	33.506	0.0	72	180 min Summer	24.949	0.0	104	240 min Summer	20.093	0.0	134	360 min Summer	14.773	0.0	196	480 min Summer	11.871	0.0	256	600 min Summer	10.010	0.0	318	720 min Summer	8.703	0.0	376	960 min Summer	6.973	0.0	500	1440 min Summer	5.093	0.0	736	2160 min Summer	3.711	0.0	1100	2880 min Summer	2.961	0.0	1468	4320 min Summer	2.150	0.0	2200	5760 min Summer	1.711	0.0	2856	7200 min Summer	1.432	0.0	3544	8640 min Summer	1.240	0.0	4336	10080 min Summer	1.098	0.0	5024	15 min Winter	125.353	0.0	15
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Henderson Place Lane		SUDs Drainage			
Edinburgh EH3 5DG		Trench Soakaway [TSA] 12			
Date 28/02/2017 19:05		Designed by LK/AC			
File TRENCH SA 12.SRCX		Checked by AMF			
Micro Drainage		Source Control 2015.1			
<u>Summary of Results for 100 year Return Period (+40%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	1.924	1.924	2.8	3.9	Flood Risk
60 min Winter	1.783	1.783	2.8	3.7	Flood Risk
120 min Winter	1.417	1.417	2.5	3.0	O K
180 min Winter	1.143	1.143	2.1	2.4	O K
240 min Winter	0.933	0.933	1.9	2.0	O K
360 min Winter	0.651	0.651	1.5	1.4	O K
480 min Winter	0.472	0.472	1.2	1.0	O K
600 min Winter	0.346	0.346	1.1	0.7	O K
720 min Winter	0.254	0.254	0.9	0.5	O K
960 min Winter	0.127	0.127	0.8	0.3	O K
1440 min Winter	0.044	0.044	0.6	0.1	O K
2160 min Winter	0.032	0.032	0.4	0.1	O K
2880 min Winter	0.026	0.026	0.3	0.0	O K
4320 min Winter	0.019	0.019	0.2	0.0	O K
5760 min Winter	0.015	0.015	0.2	0.0	O K
7200 min Winter	0.013	0.013	0.2	0.0	O K
8640 min Winter	0.011	0.011	0.1	0.0	O K
10080 min Winter	0.010	0.010	0.1	0.0	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)		
30 min Winter	84.267	0.0	24		
60 min Winter	54.074	0.0	42		
120 min Winter	33.506	0.0	76		
180 min Winter	24.949	0.0	108		
240 min Winter	20.093	0.0	140		
360 min Winter	14.773	0.0	202		
480 min Winter	11.871	0.0	262		
600 min Winter	10.010	0.0	322		
720 min Winter	8.703	0.0	384		
960 min Winter	6.973	0.0	502		
1440 min Winter	5.093	0.0	736		
2160 min Winter	3.711	0.0	1064		
2880 min Winter	2.961	0.0	1420		
4320 min Winter	2.150	0.0	2168		
5760 min Winter	1.711	0.0	2872		
7200 min Winter	1.432	0.0	3600		
8640 min Winter	1.240	0.0	4272		
10080 min Winter	1.098	0.0	5032		
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Date 28/02/2017 19:05 File TRENCH SA 12.SRCX	Designed by LK/AC Checked by AMF	
Micro Drainage Source Control 2015.1		

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.100	Shortest Storm (mins)	15
Ratio R	0.350	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

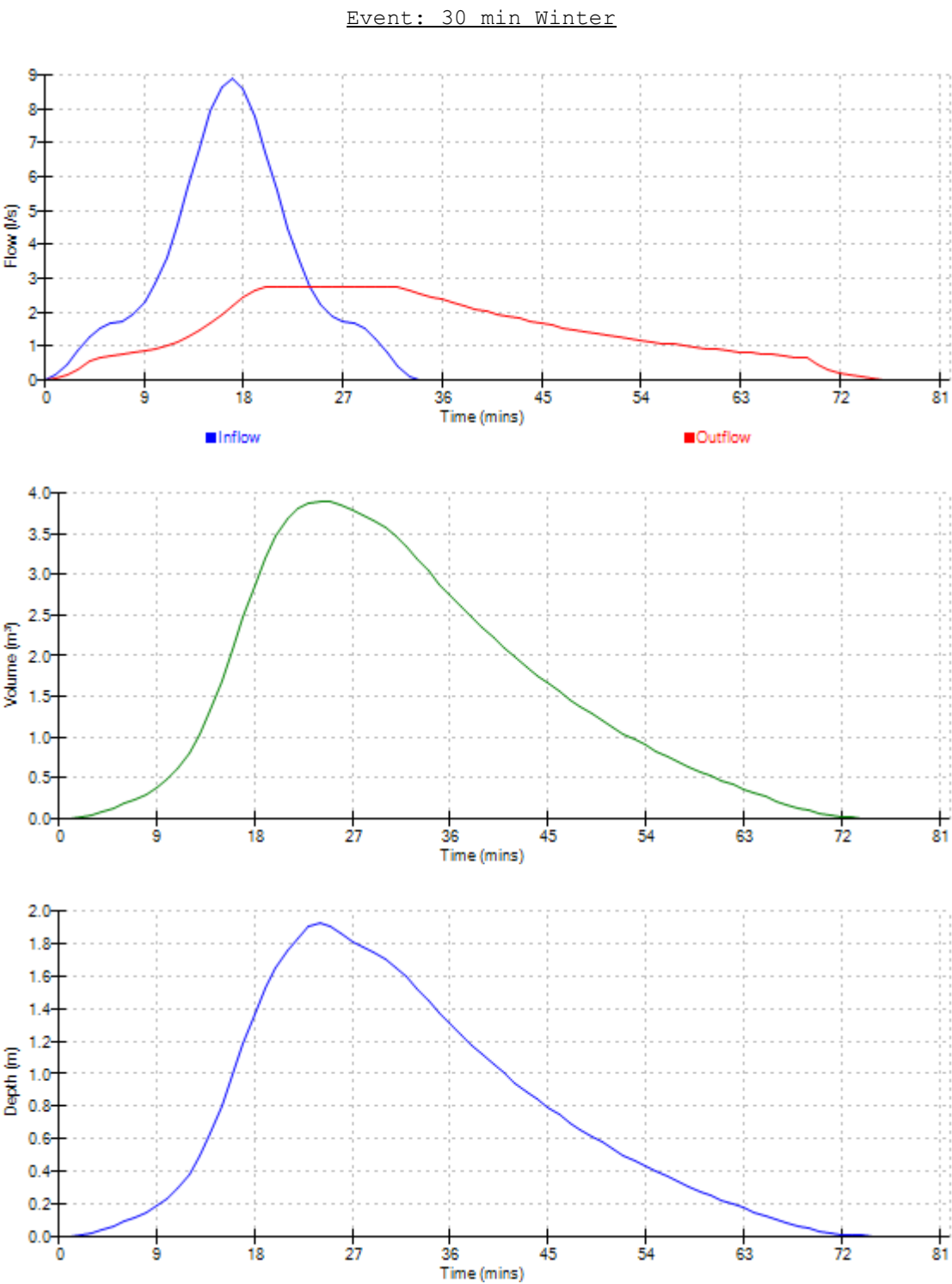
Time Area Diagram

Total Area (ha) 0.019

Time (mins)	Area	Time (mins)	Area
From: To:	(ha)	From: To:	(ha)
0 2	0.010	2 4	0.009

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19 - 21 Silvermills Court Henderson Place Lane Edinburgh EH3 5DG	Havant Road, Emsworth SUDs Drainage Trench Soakaway [TSA] 12																					
Date 28/02/2017 19:05 File TRENCH SA 12.SRCX	Designed by LK/AC Checked by AMF																					
Micro Drainage Source Control 2015.1																						
<u>Model Details</u> Storage is Online Cover Level (m) 2.000 <u>Trench Soakaway Structure</u> <table> <tr> <td>Infiltration Coefficient Base (m/hr)</td> <td>0.61200</td> <td>Trench Width (m)</td> <td>1.0</td> </tr> <tr> <td>Infiltration Coefficient Side (m/hr)</td> <td>0.61200</td> <td>Trench Length (m)</td> <td>7.0</td> </tr> <tr> <td>Safety Factor</td> <td>2.0</td> <td>Slope (1:X)</td> <td>1000.0</td> </tr> <tr> <td>Porosity</td> <td>0.30</td> <td>Cap Volume Depth (m)</td> <td>1.800</td> </tr> <tr> <td>Invert Level (m)</td> <td>0.000</td> <td>Cap Infiltration Depth (m)</td> <td>1.600</td> </tr> </table>			Infiltration Coefficient Base (m/hr)	0.61200	Trench Width (m)	1.0	Infiltration Coefficient Side (m/hr)	0.61200	Trench Length (m)	7.0	Safety Factor	2.0	Slope (1:X)	1000.0	Porosity	0.30	Cap Volume Depth (m)	1.800	Invert Level (m)	0.000	Cap Infiltration Depth (m)	1.600
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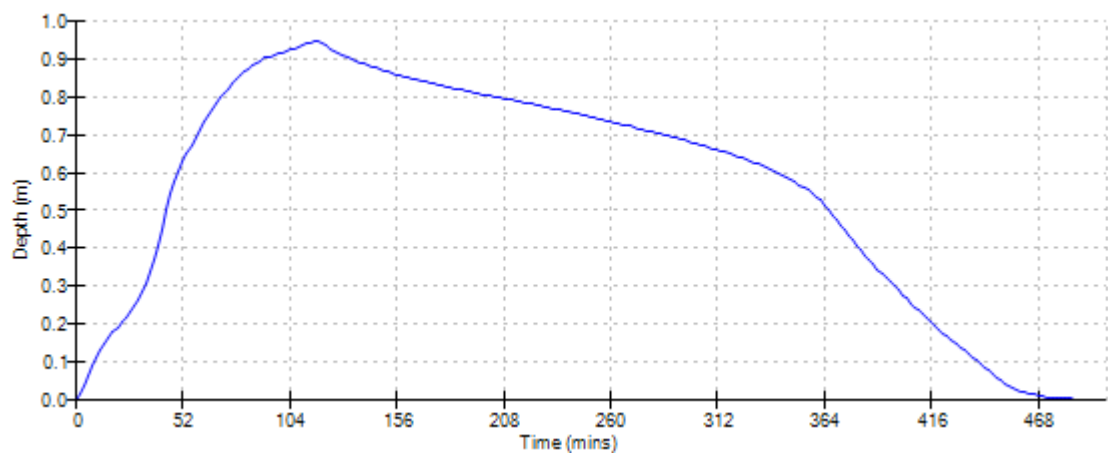
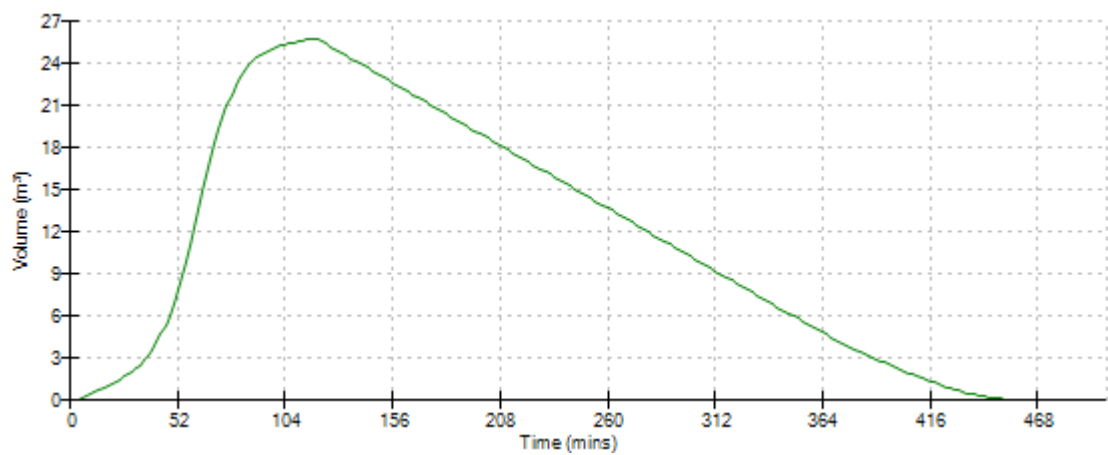
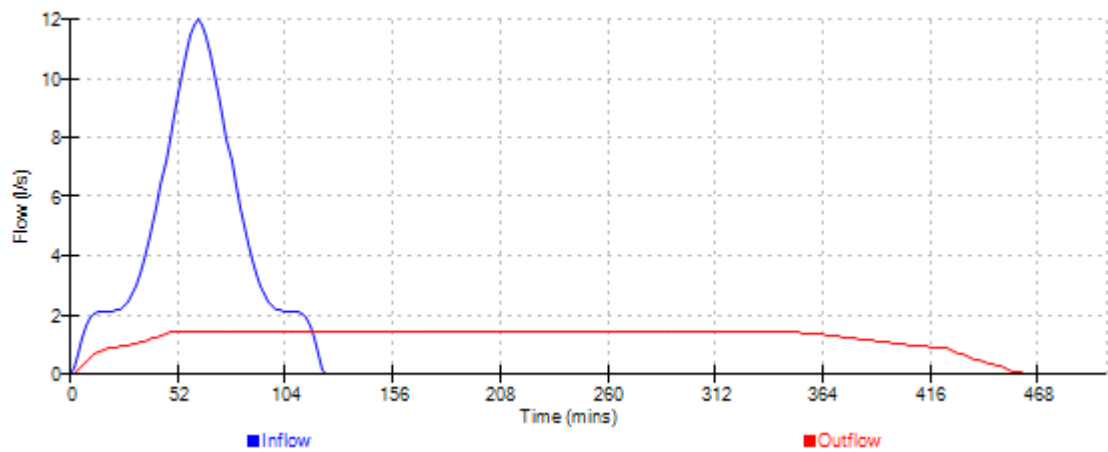


Cundall, Johnston & Partners					Page 1																																																																																																																																																																																																																		
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Summary of Results for 100 year Return Period (+40%) Half Drain Time : 156 minutes. <table><thead><tr><th>Storm Event</th><th>Max Level (m)</th><th>Max Depth (m)</th><th>Max Infiltration (l/s)</th><th>Max Volume (m³)</th><th>Status</th></tr></thead><tbody><tr><td>15 min Summer</td><td>0.727</td><td>0.727</td><td>1.4</td><td>13.1</td><td>Flood Risk</td></tr><tr><td>30 min Summer</td><td>0.782</td><td>0.782</td><td>1.4</td><td>17.0</td><td>Flood Risk</td></tr><tr><td>60 min Summer</td><td>0.824</td><td>0.824</td><td>1.4</td><td>20.3</td><td>Flood Risk</td></tr><tr><td>120 min Summer</td><td>0.849</td><td>0.849</td><td>1.4</td><td>22.0</td><td>Flood Risk</td></tr><tr><td>180 min Summer</td><td>0.847</td><td>0.847</td><td>1.4</td><td>21.9</td><td>Flood Risk</td></tr><tr><td>240 min Summer</td><td>0.839</td><td>0.839</td><td>1.4</td><td>21.3</td><td>Flood Risk</td></tr><tr><td>360 min Summer</td><td>0.820</td><td>0.820</td><td>1.4</td><td>20.0</td><td>Flood Risk</td></tr><tr><td>480 min Summer</td><td>0.803</td><td>0.803</td><td>1.4</td><td>18.7</td><td>Flood Risk</td></tr><tr><td>600 min Summer</td><td>0.787</td><td>0.787</td><td>1.4</td><td>17.4</td><td>Flood Risk</td></tr><tr><td>720 min Summer</td><td>0.770</td><td>0.770</td><td>1.4</td><td>16.2</td><td>Flood Risk</td></tr><tr><td>960 min Summer</td><td>0.737</td><td>0.737</td><td>1.4</td><td>13.8</td><td>Flood Risk</td></tr><tr><td>1440 min Summer</td><td>0.670</td><td>0.670</td><td>1.4</td><td>9.7</td><td>O K</td></tr><tr><td>2160 min Summer</td><td>0.570</td><td>0.570</td><td>1.4</td><td>5.8</td><td>O K</td></tr><tr><td>2880 min Summer</td><td>0.443</td><td>0.443</td><td>1.2</td><td>4.0</td><td>O K</td></tr><tr><td>4320 min Summer</td><td>0.256</td><td>0.256</td><td>1.0</td><td>1.9</td><td>O K</td></tr><tr><td>5760 min Summer</td><td>0.167</td><td>0.167</td><td>0.9</td><td>0.9</td><td>O K</td></tr><tr><td>7200 min Summer</td><td>0.143</td><td>0.143</td><td>0.7</td><td>0.7</td><td>O K</td></tr><tr><td>8640 min 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19 - 21 Silvermills Court Henderson Place Lane Edinburgh EH3 5DG		Havant Road, Emsworth SUDs Drainage Swale 1			
Date 28/02/2017 12:23 File SWALE 1.SRCX		Designed by LK/AC Checked by AMF			
Micro Drainage		Source Control 2015.1			
<u>Summary of Results for 100 year Return Period (+40%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	0.811	0.811	1.4	19.3	Flood Risk
60 min Winter	0.873	0.873	1.4	23.3	Flood Risk
120 min Winter	0.946	0.946	1.4	25.7	Flood Risk
180 min Winter	0.942	0.942	1.4	25.7	Flood Risk
240 min Winter	0.910	0.910	1.4	24.9	Flood Risk
360 min Winter	0.867	0.867	1.4	23.0	Flood Risk
480 min Winter	0.834	0.834	1.4	21.0	Flood Risk
600 min Winter	0.807	0.807	1.4	19.0	Flood Risk
720 min Winter	0.781	0.781	1.4	17.0	Flood Risk
960 min Winter	0.729	0.729	1.4	13.3	Flood Risk
1440 min Winter	0.624	0.624	1.4	7.6	O K
2160 min Winter	0.436	0.436	1.2	3.9	O K
2880 min Winter	0.282	0.282	1.0	2.2	O K
4320 min Winter	0.154	0.154	0.8	0.8	O K
5760 min Winter	0.125	0.125	0.6	0.5	O K
7200 min Winter	0.107	0.107	0.5	0.4	O K
8640 min Winter	0.093	0.093	0.4	0.3	O K
10080 min Winter	0.083	0.083	0.4	0.2	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)		
30 min Winter	84.267	0.0	32		
60 min Winter	54.074	0.0	60		
120 min Winter	33.506	0.0	116		
180 min Winter	24.949	0.0	170		
240 min Winter	20.093	0.0	192		
360 min Winter	14.773	0.0	268		
480 min Winter	11.871	0.0	342		
600 min Winter	10.010	0.0	416		
720 min Winter	8.703	0.0	484		
960 min Winter	6.973	0.0	616		
1440 min Winter	5.093	0.0	850		
2160 min Winter	3.711	0.0	1172		
2880 min Winter	2.961	0.0	1532		
4320 min Winter	2.150	0.0	2200		
5760 min Winter	1.711	0.0	2912		
7200 min Winter	1.432	0.0	3640		
8640 min Winter	1.240	0.0	4376		
10080 min Winter	1.098	0.0	5008		
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19 - 21 Silvermills Court Henderson Place Lane Edinburgh EH3 5DG	Havant Road, Emsworth SUDs Drainage Swale 1																									
Date 28/02/2017 12:23 File SWALE 1.SRCX	Designed by LK/AC Checked by AMF																									
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<u>Model Details</u> Storage is Online Cover Level (m) 1.000 <u>Dry Swale Structure</u> <table> <tr> <td>Infiltration Coefficient Base (m/hr)</td> <td>0.14400</td> <td>Trench Width (m)</td> <td>1.1</td> </tr> <tr> <td>Infiltration Coefficient Side (m/hr)</td> <td>0.14400</td> <td>Trench Length (m)</td> <td>33.6</td> </tr> <tr> <td>Safety Factor</td> <td>2.0</td> <td>Side Slope (1:X)</td> <td>3.0</td> </tr> <tr> <td>Porosity</td> <td>0.30</td> <td>Slope (1:X)</td> <td>200.0</td> </tr> <tr> <td>Invert Level (m)</td> <td>0.000</td> <td>Cap Volume Depth (m)</td> <td>0.800</td> </tr> <tr> <td>Trench Height (m)</td> <td>0.500</td> <td>Cap Infiltration Depth (m)</td> <td>0.500</td> </tr> </table>			Infiltration Coefficient Base (m/hr)	0.14400	Trench Width (m)	1.1	Infiltration Coefficient Side (m/hr)	0.14400	Trench Length (m)	33.6	Safety Factor	2.0	Side Slope (1:X)	3.0	Porosity	0.30	Slope (1:X)	200.0	Invert Level (m)	0.000	Cap Volume Depth (m)	0.800	Trench Height (m)	0.500	Cap Infiltration Depth (m)	0.500
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Event: 120 min Winter



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Summary of Results for 100 year Return Period (+40%) Half Drain Time : 1388 minutes. <table><tr><th>Storm Event</th><th>Max Level (m)</th><th>Max Depth (m)</th><th>Max Infiltration (l/s)</th><th>Max Volume (m³)</th><th>Status</th></tr><tr><td>15 min Summer</td><td>0.433</td><td>0.433</td><td>0.1</td><td>8.4</td><td>O K</td></tr><tr><td>30 min Summer</td><td>0.536</td><td>0.536</td><td>0.2</td><td>11.2</td><td>O K</td></tr><tr><td>60 min Summer</td><td>0.599</td><td>0.599</td><td>0.2</td><td>14.2</td><td>O K</td></tr><tr><td>120 min Summer</td><td>0.643</td><td>0.643</td><td>0.2</td><td>17.2</td><td>O K</td></tr><tr><td>180 min Summer</td><td>0.663</td><td>0.663</td><td>0.2</td><td>18.8</td><td>O K</td></tr><tr><td>240 min Summer</td><td>0.675</td><td>0.675</td><td>0.2</td><td>19.9</td><td>O K</td></tr><tr><td>360 min Summer</td><td>0.688</td><td>0.688</td><td>0.2</td><td>21.2</td><td>O K</td></tr><tr><td>480 min Summer</td><td>0.696</td><td>0.696</td><td>0.2</td><td>21.9</td><td>O K</td></tr><tr><td>600 min Summer</td><td>0.700</td><td>0.700</td><td>0.2</td><td>22.4</td><td>Flood Risk</td></tr><tr><td>720 min Summer</td><td>0.702</td><td>0.702</td><td>0.2</td><td>22.6</td><td>Flood Risk</td></tr><tr><td>960 min Summer</td><td>0.703</td><td>0.703</td><td>0.2</td><td>22.7</td><td>Flood Risk</td></tr><tr><td>1440 min Summer</td><td>0.699</td><td>0.699</td><td>0.2</td><td>22.3</td><td>O K</td></tr><tr><td>2160 min Summer</td><td>0.690</td><td>0.690</td><td>0.2</td><td>21.4</td><td>O K</td></tr><tr><td>2880 min Summer</td><td>0.681</td><td>0.681</td><td>0.2</td><td>20.4</td><td>O K</td></tr><tr><td>4320 min Summer</td><td>0.659</td><td>0.659</td><td>0.2</td><td>18.5</td><td>O K</td></tr><tr><td>5760 min Summer</td><td>0.636</td><td>0.636</td><td>0.2</td><td>16.6</td><td>O K</td></tr><tr><td>7200 min Summer</td><td>0.612</td><td>0.612</td><td>0.2</td><td>14.9</td><td>O K</td></tr><tr><td>8640 min Summer</td><td>0.586</td><td>0.586</td><td>0.2</td><td>13.4</td><td>O K</td></tr><tr><td>10080 min Summer</td><td>0.560</td><td>0.560</td><td>0.2</td><td>12.1</td><td>O K</td></tr><tr><td>15 min Winter</td><td>0.473</td><td>0.473</td><td>0.1</td><td>9.4</td><td>O K</td></tr></table> <table><tr><th>Storm Event</th><th>Rain (mm/hr)</th><th>Flooded Volume (m³)</th><th>Time-Peak (mins)</th></tr><tr><td>15 min Summer</td><td>125.353</td><td>0.0</td><td>19</td></tr><tr><td>30 min Summer</td><td>84.267</td><td>0.0</td><td>34</td></tr><tr><td>60 min Summer</td><td>54.074</td><td>0.0</td><td>64</td></tr><tr><td>120 min Summer</td><td>33.506</td><td>0.0</td><td>124</td></tr><tr><td>180 min Summer</td><td>24.949</td><td>0.0</td><td>182</td></tr><tr><td>240 min Summer</td><td>20.093</td><td>0.0</td><td>242</td></tr><tr><td>360 min Summer</td><td>14.773</td><td>0.0</td><td>362</td></tr><tr><td>480 min Summer</td><td>11.871</td><td>0.0</td><td>482</td></tr><tr><td>600 min Summer</td><td>10.010</td><td>0.0</td><td>602</td></tr><tr><td>720 min Summer</td><td>8.703</td><td>0.0</td><td>720</td></tr><tr><td>960 min Summer</td><td>6.973</td><td>0.0</td><td>960</td></tr><tr><td>1440 min Summer</td><td>5.093</td><td>0.0</td><td>1198</td></tr><tr><td>2160 min Summer</td><td>3.711</td><td>0.0</td><td>1560</td></tr><tr><td>2880 min Summer</td><td>2.961</td><td>0.0</td><td>1964</td></tr><tr><td>4320 min Summer</td><td>2.150</td><td>0.0</td><td>2772</td></tr><tr><td>5760 min Summer</td><td>1.711</td><td>0.0</td><td>3584</td></tr><tr><td>7200 min Summer</td><td>1.432</td><td>0.0</td><td>4392</td></tr><tr><td>8640 min Summer</td><td>1.240</td><td>0.0</td><td>5184</td></tr><tr><td>10080 min Summer</td><td>1.098</td><td>0.0</td><td>5856</td></tr><tr><td>15 min Winter</td><td>125.353</td><td>0.0</td><td>19</td></tr></table>							Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status	15 min Summer	0.433	0.433	0.1	8.4	O K	30 min Summer	0.536	0.536	0.2	11.2	O K	60 min Summer	0.599	0.599	0.2	14.2	O K	120 min Summer	0.643	0.643	0.2	17.2	O K	180 min Summer	0.663	0.663	0.2	18.8	O K	240 min Summer	0.675	0.675	0.2	19.9	O K	360 min Summer	0.688	0.688	0.2	21.2	O K	480 min Summer	0.696	0.696	0.2	21.9	O K	600 min Summer	0.700	0.700	0.2	22.4	Flood Risk	720 min Summer	0.702	0.702	0.2	22.6	Flood Risk	960 min Summer	0.703	0.703	0.2	22.7	Flood Risk	1440 min Summer	0.699	0.699	0.2	22.3	O K	2160 min Summer	0.690	0.690	0.2	21.4	O K	2880 min Summer	0.681	0.681	0.2	20.4	O K	4320 min Summer	0.659	0.659	0.2	18.5	O K	5760 min Summer	0.636	0.636	0.2	16.6	O K	7200 min Summer	0.612	0.612	0.2	14.9	O K	8640 min Summer	0.586	0.586	0.2	13.4	O K	10080 min Summer	0.560	0.560	0.2	12.1	O K	15 min Winter	0.473	0.473	0.1	9.4	O K	Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)	15 min Summer	125.353	0.0	19	30 min Summer	84.267	0.0	34	60 min Summer	54.074	0.0	64	120 min Summer	33.506	0.0	124	180 min Summer	24.949	0.0	182	240 min Summer	20.093	0.0	242	360 min Summer	14.773	0.0	362	480 min Summer	11.871	0.0	482	600 min Summer	10.010	0.0	602	720 min Summer	8.703	0.0	720	960 min Summer	6.973	0.0	960	1440 min Summer	5.093	0.0	1198	2160 min Summer	3.711	0.0	1560	2880 min Summer	2.961	0.0	1964	4320 min Summer	2.150	0.0	2772	5760 min Summer	1.711	0.0	3584	7200 min Summer	1.432	0.0	4392	8640 min Summer	1.240	0.0	5184	10080 min Summer	1.098	0.0	5856	15 min Winter	125.353	0.0	19
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Cundall, Johnston & Partners				Page 2	
19 - 21 Silvermills Court Henderson Place Lane Edinburgh EH3 5DG		Havant Road, Emsworth SUDs Drainage Swale 2			
Date 28/02/2017 12:27 File SWALE 2.SRCX		Designed by LK/AC Checked by AMF			
Micro Drainage		Source Control 2015.1			
<u>Summary of Results for 100 year Return Period (+40%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	0.568	0.568	0.2	12.5	O K
60 min Winter	0.626	0.626	0.2	15.9	O K
120 min Winter	0.669	0.669	0.2	19.4	O K
180 min Winter	0.689	0.689	0.2	21.3	O K
240 min Winter	0.701	0.701	0.2	22.5	Flood Risk
360 min Winter	0.715	0.715	0.2	24.0	Flood Risk
480 min Winter	0.724	0.724	0.2	25.0	Flood Risk
600 min Winter	0.729	0.729	0.2	25.6	Flood Risk
720 min Winter	0.732	0.732	0.2	26.0	Flood Risk
960 min Winter	0.735	0.735	0.2	26.3	Flood Risk
1440 min Winter	0.732	0.732	0.2	26.0	Flood Risk
2160 min Winter	0.722	0.722	0.2	24.8	Flood Risk
2880 min Winter	0.710	0.710	0.2	23.5	Flood Risk
4320 min Winter	0.682	0.682	0.2	20.6	O K
5760 min Winter	0.651	0.651	0.2	17.8	O K
7200 min Winter	0.617	0.617	0.2	15.3	O K
8640 min Winter	0.580	0.580	0.2	13.1	O K
10080 min Winter	0.538	0.538	0.2	11.3	O K
Storm Event	Rain (mm/hr)		Flooded Volume (m³)	Time-Peak (mins)	
30 min Winter	84.267		0.0	33	
60 min Winter	54.074		0.0	62	
120 min Winter	33.506		0.0	122	
180 min Winter	24.949		0.0	180	
240 min Winter	20.093		0.0	240	
360 min Winter	14.773		0.0	356	
480 min Winter	11.871		0.0	472	
600 min Winter	10.010		0.0	588	
720 min Winter	8.703		0.0	702	
960 min Winter	6.973		0.0	926	
1440 min Winter	5.093		0.0	1356	
2160 min Winter	3.711		0.0	1688	
2880 min Winter	2.961		0.0	2136	
4320 min Winter	2.150		0.0	3028	
5760 min Winter	1.711		0.0	3872	
7200 min Winter	1.432		0.0	4688	
8640 min Winter	1.240		0.0	5448	
10080 min Winter	1.098		0.0	6248	
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19 - 21 Silvermills Court Henderson Place Lane Edinburgh EH3 5DG	Havant Road, Emsworth SUDs Drainage Swale 2	
Date 28/02/2017 12:27 File SWALE 2.SRCX	Designed by LK/AC Checked by AMF	
Micro Drainage	Source Control 2015.1	

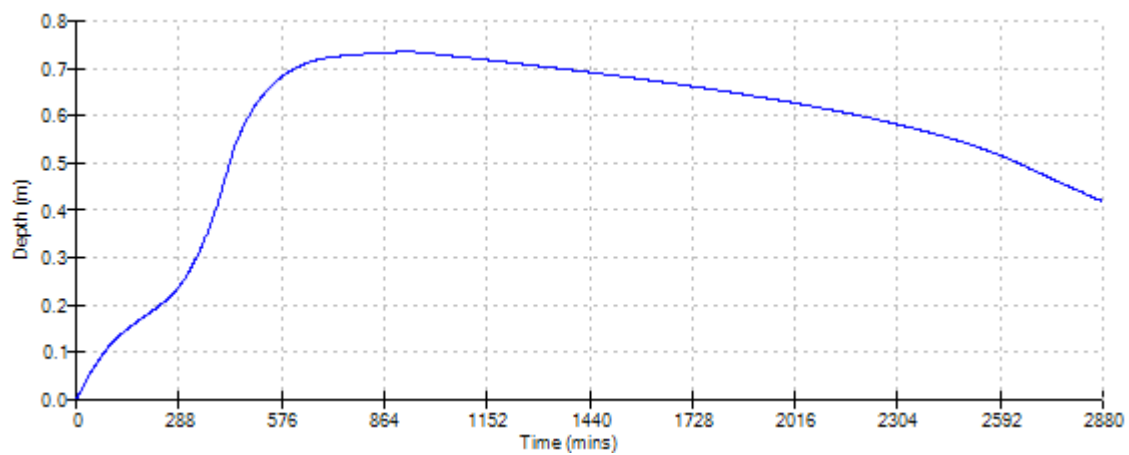
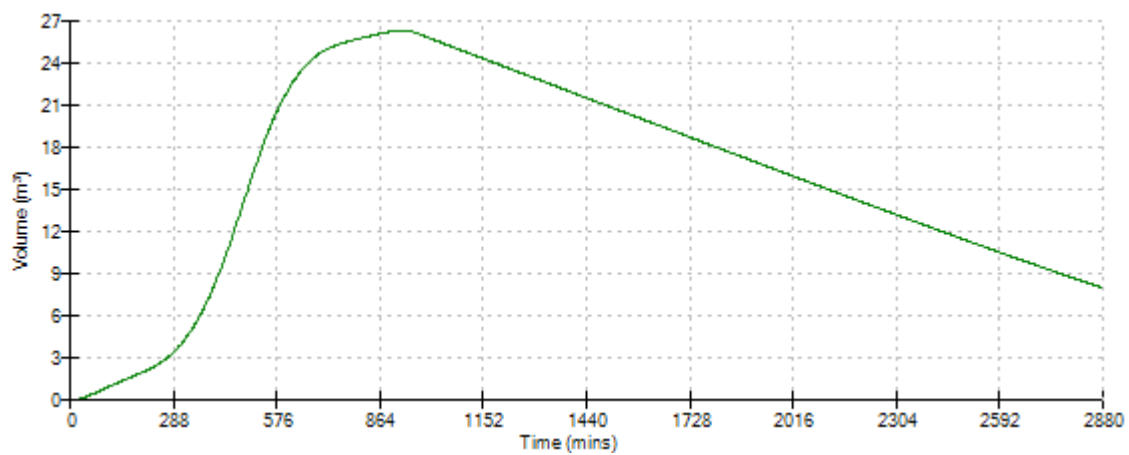
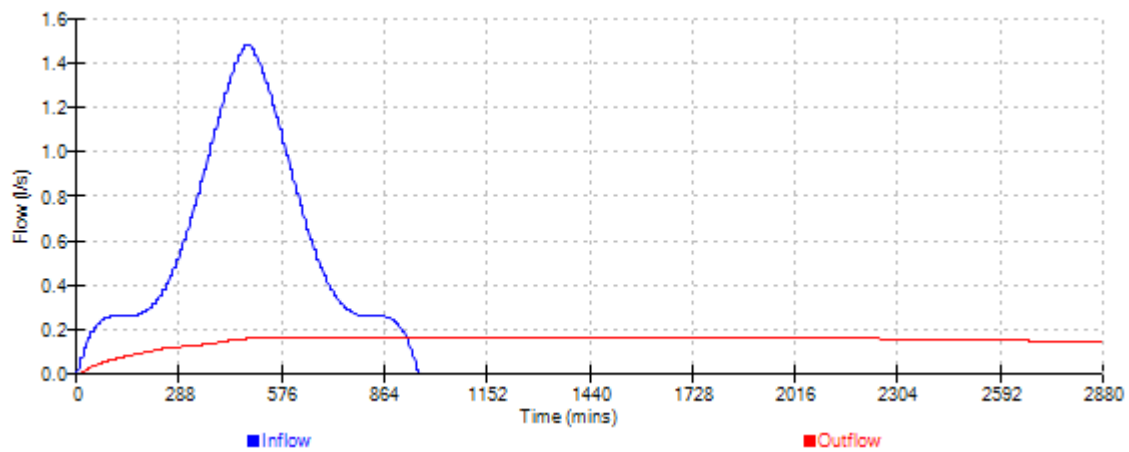
Model Details

Storage is Online Cover Level (m) 1.000

Dry Swale Structure

Infiltration Coefficient Base (m/hr)	0.00900	Trench Width (m)	2.0
Infiltration Coefficient Side (m/hr)	0.00900	Trench Length (m)	42.6
Safety Factor	2.0	Side Slope (1:X)	3.0
Porosity	0.30	Slope (1:X)	200.0
Invert Level (m)	0.000	Cap Volume Depth (m)	0.800
Trench Height (m)	0.500	Cap Infiltration Depth (m)	0.500

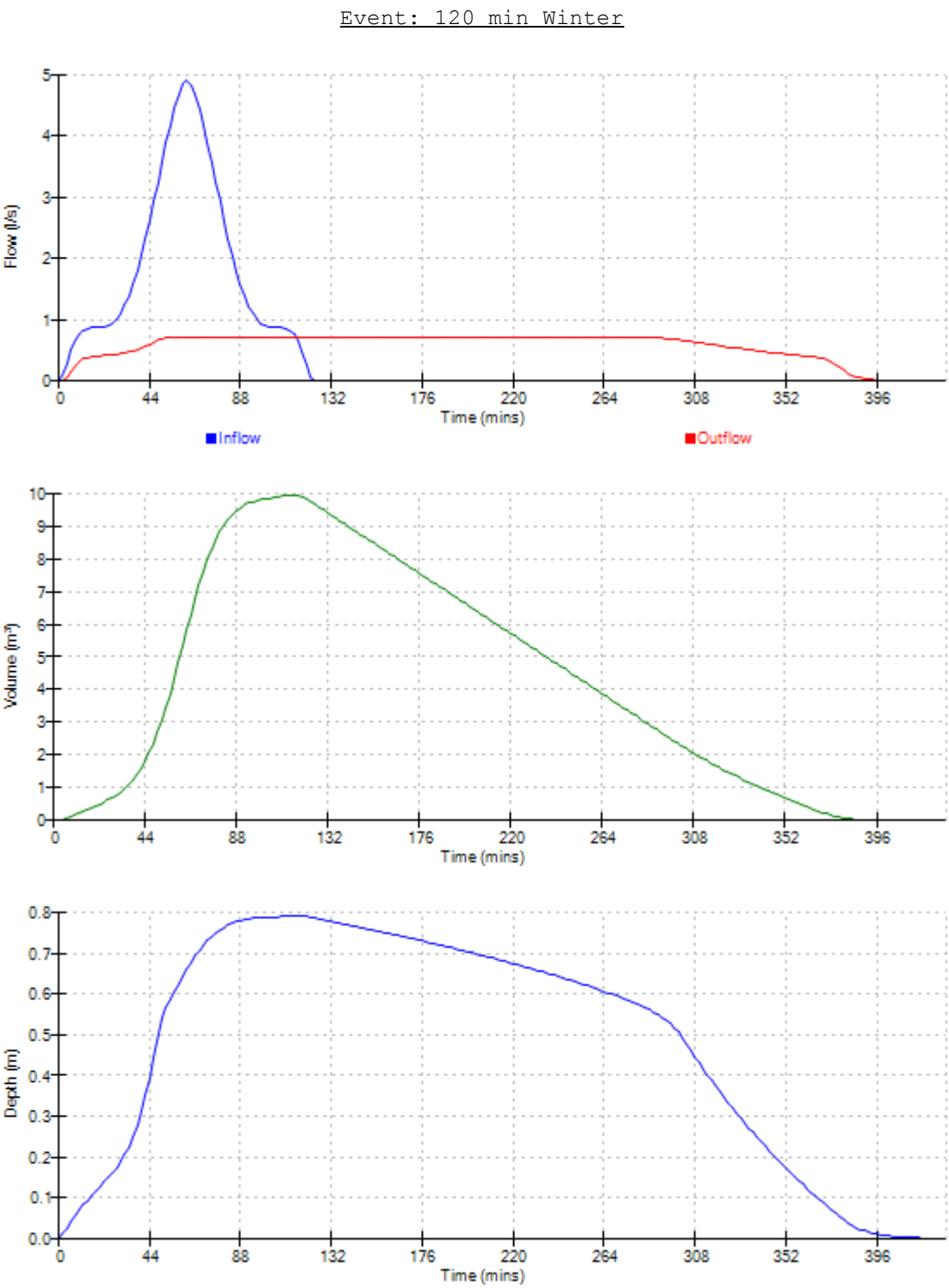
Event: 960 min Winter



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<u>Summary of Results for 100 year Return Period (+40%)</u> Half Drain Time : 122 minutes. <table><thead><tr><th>Storm Event</th><th>Max Level (m)</th><th>Max Depth (m)</th><th>Max Infiltration (l/s)</th><th>Max Volume (m³)</th><th>Status</th></tr></thead><tbody><tr><td>15 min Summer</td><td>0.661</td><td>0.661</td><td>0.7</td><td>5.3</td><td>O K</td></tr><tr><td>30 min Summer</td><td>0.709</td><td>0.709</td><td>0.7</td><td>6.8</td><td>Flood Risk</td></tr><tr><td>60 min Summer</td><td>0.743</td><td>0.743</td><td>0.7</td><td>8.0</td><td>Flood Risk</td></tr><tr><td>120 min Summer</td><td>0.755</td><td>0.755</td><td>0.7</td><td>8.5</td><td>Flood Risk</td></tr><tr><td>180 min Summer</td><td>0.752</td><td>0.752</td><td>0.7</td><td>8.4</td><td>Flood Risk</td></tr><tr><td>240 min Summer</td><td>0.744</td><td>0.744</td><td>0.7</td><td>8.1</td><td>Flood Risk</td></tr><tr><td>360 min Summer</td><td>0.726</td><td>0.726</td><td>0.7</td><td>7.4</td><td>Flood Risk</td></tr><tr><td>480 min Summer</td><td>0.709</td><td>0.709</td><td>0.7</td><td>6.8</td><td>Flood Risk</td></tr><tr><td>600 min Summer</td><td>0.691</td><td>0.691</td><td>0.7</td><td>6.2</td><td>O K</td></tr><tr><td>720 min Summer</td><td>0.673</td><td>0.673</td><td>0.7</td><td>5.7</td><td>O K</td></tr><tr><td>960 min Summer</td><td>0.636</td><td>0.636</td><td>0.7</td><td>4.6</td><td>O K</td></tr><tr><td>1440 min Summer</td><td>0.567</td><td>0.567</td><td>0.7</td><td>3.1</td><td>O K</td></tr><tr><td>2160 min Summer</td><td>0.419</td><td>0.419</td><td>0.6</td><td>1.9</td><td>O K</td></tr><tr><td>2880 min Summer</td><td>0.291</td><td>0.291</td><td>0.5</td><td>1.3</td><td>O K</td></tr><tr><td>4320 min Summer</td><td>0.140</td><td>0.140</td><td>0.4</td><td>0.5</td><td>O K</td></tr><tr><td>5760 min Summer</td><td>0.081</td><td>0.081</td><td>0.4</td><td>0.2</td><td>O K</td></tr><tr><td>7200 min Summer</td><td>0.068</td><td>0.068</td><td>0.3</td><td>0.1</td><td>O K</td></tr><tr><td>8640 min 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Summer</td><td>10.010</td><td>0.0</td><td>372</td></tr><tr><td>720 min Summer</td><td>8.703</td><td>0.0</td><td>436</td></tr><tr><td>960 min Summer</td><td>6.973</td><td>0.0</td><td>560</td></tr><tr><td>1440 min Summer</td><td>5.093</td><td>0.0</td><td>794</td></tr><tr><td>2160 min Summer</td><td>3.711</td><td>0.0</td><td>1148</td></tr><tr><td>2880 min Summer</td><td>2.961</td><td>0.0</td><td>1500</td></tr><tr><td>4320 min Summer</td><td>2.150</td><td>0.0</td><td>2208</td></tr><tr><td>5760 min Summer</td><td>1.711</td><td>0.0</td><td>2928</td></tr><tr><td>7200 min Summer</td><td>1.432</td><td>0.0</td><td>3656</td></tr><tr><td>8640 min Summer</td><td>1.240</td><td>0.0</td><td>4344</td></tr><tr><td>10080 min Summer</td><td>1.098</td><td>0.0</td><td>4992</td></tr><tr><td>15 min Winter</td><td>125.353</td><td>0.0</td><td>18</td></tr></tbody></table>						Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status	15 min Summer	0.661	0.661	0.7	5.3	O K	30 min 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19 - 21 Silvermills Court Henderson Place Lane Edinburgh EH3 5DG		Havant Road, Emsworth SUDs Drainage Swale 3			
Date 28/02/2017 12:28 File SWALE 3.SRCX		Designed by LK/AC Checked by AMF			
Micro Drainage		Source Control 2015.1			
<u>Summary of Results for 100 year Return Period (+40%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	0.736	0.736	0.7	7.8	Flood Risk
60 min Winter	0.774	0.774	0.7	9.2	Flood Risk
120 min Winter	0.791	0.791	0.7	10.0	Flood Risk
180 min Winter	0.786	0.786	0.7	9.8	Flood Risk
240 min Winter	0.777	0.777	0.7	9.4	Flood Risk
360 min Winter	0.753	0.753	0.7	8.4	Flood Risk
480 min Winter	0.726	0.726	0.7	7.4	Flood Risk
600 min Winter	0.699	0.699	0.7	6.5	O K
720 min Winter	0.671	0.671	0.7	5.6	O K
960 min Winter	0.615	0.615	0.7	4.1	O K
1440 min Winter	0.488	0.488	0.7	2.3	O K
2160 min Winter	0.279	0.279	0.5	1.2	O K
2880 min Winter	0.153	0.153	0.4	0.6	O K
4320 min Winter	0.074	0.074	0.3	0.2	O K
5760 min Winter	0.059	0.059	0.3	0.1	O K
7200 min Winter	0.050	0.050	0.2	0.1	O K
8640 min Winter	0.047	0.047	0.2	0.1	O K
10080 min Winter	0.044	0.044	0.2	0.1	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)		
30 min Winter	84.267	0.0	32		
60 min Winter	54.074	0.0	60		
120 min Winter	33.506	0.0	116		
180 min Winter	24.949	0.0	146		
240 min Winter	20.093	0.0	184		
360 min Winter	14.773	0.0	260		
480 min Winter	11.871	0.0	332		
600 min Winter	10.010	0.0	402		
720 min Winter	8.703	0.0	468		
960 min Winter	6.973	0.0	588		
1440 min Winter	5.093	0.0	808		
2160 min Winter	3.711	0.0	1168		
2880 min Winter	2.961	0.0	1528		
4320 min Winter	2.150	0.0	2200		
5760 min Winter	1.711	0.0	2936		
7200 min Winter	1.432	0.0	3664		
8640 min Winter	1.240	0.0	4280		
10080 min Winter	1.098	0.0	5088		
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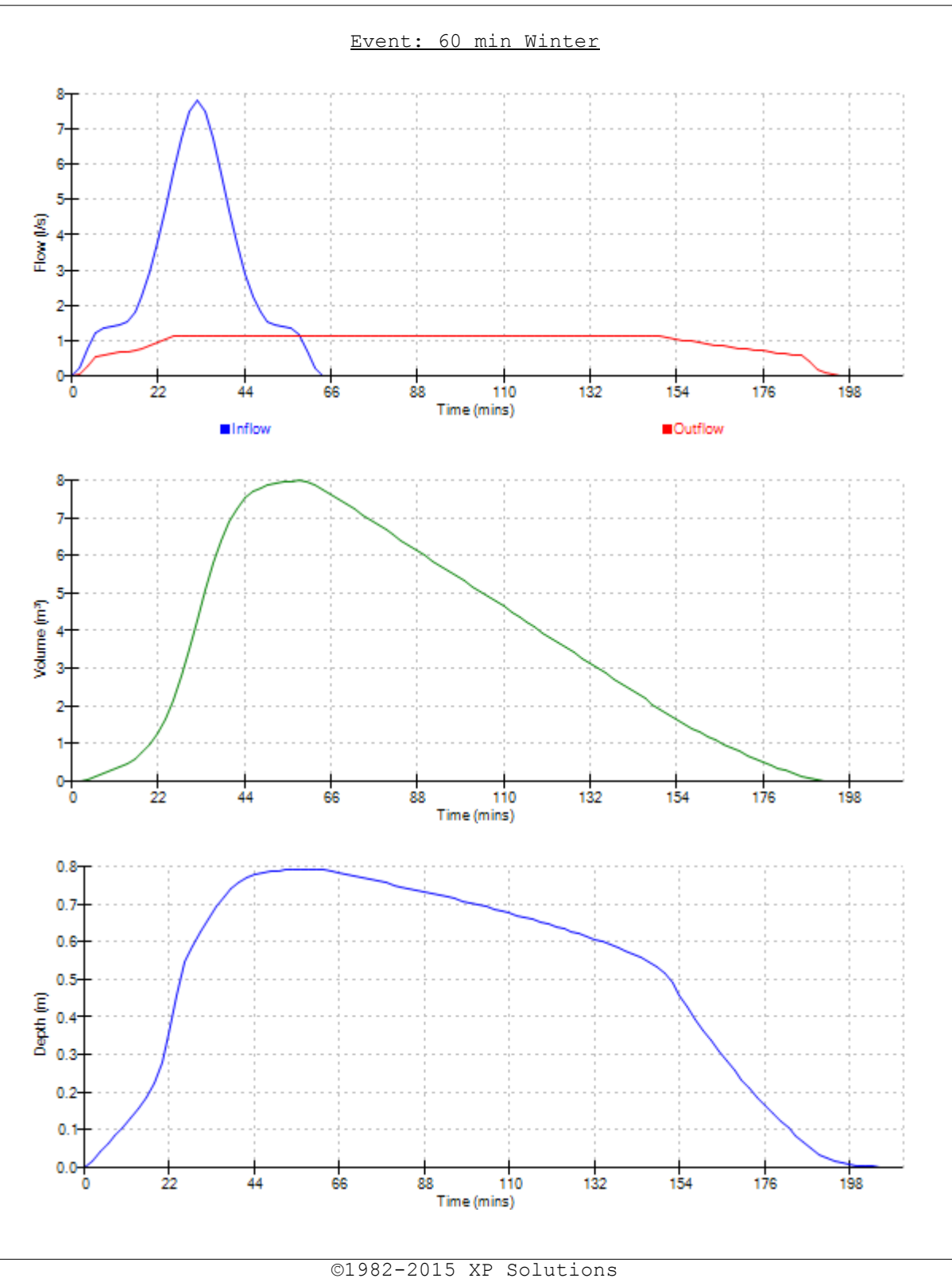
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Summer</td><td>11.871</td><td>0.0</td><td>284</td></tr><tr><td>600 min Summer</td><td>10.010</td><td>0.0</td><td>344</td></tr><tr><td>720 min Summer</td><td>8.703</td><td>0.0</td><td>400</td></tr><tr><td>960 min Summer</td><td>6.973</td><td>0.0</td><td>512</td></tr><tr><td>1440 min Summer</td><td>5.093</td><td>0.0</td><td>752</td></tr><tr><td>2160 min Summer</td><td>3.711</td><td>0.0</td><td>1108</td></tr><tr><td>2880 min Summer</td><td>2.961</td><td>0.0</td><td>1468</td></tr><tr><td>4320 min Summer</td><td>2.150</td><td>0.0</td><td>2168</td></tr><tr><td>5760 min Summer</td><td>1.711</td><td>0.0</td><td>2856</td></tr><tr><td>7200 min Summer</td><td>1.432</td><td>0.0</td><td>3592</td></tr><tr><td>8640 min Summer</td><td>1.240</td><td>0.0</td><td>4400</td></tr><tr><td>10080 min Summer</td><td>1.098</td><td>0.0</td><td>4992</td></tr><tr><td>15 min Winter</td><td>125.353</td><td>0.0</td><td>17</td></tr></tbody></table>						Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status	15 min Summer	0.689	0.689	1.1	4.9	O K	30 min Summer	0.734	0.734	1.1	6.2	Flood Risk	60 min Summer	0.756	0.756	1.1	6.8	Flood Risk	120 min Summer	0.755	0.755	1.1	6.8	Flood Risk	180 min Summer	0.741	0.741	1.1	6.4	Flood Risk	240 min Summer	0.725	0.725	1.1	5.9	Flood Risk	360 min Summer	0.689	0.689	1.1	5.0	O K	480 min Summer	0.654	0.654	1.1	4.1	O K	600 min Summer	0.619	0.619	1.1	3.4	O K	720 min Summer	0.585	0.585	1.1	2.8	O K	960 min Summer	0.519	0.519	1.1	1.9	O K	1440 min Summer	0.329	0.329	0.9	1.2	O K	2160 min Summer	0.162	0.162	0.7	0.5	O K	2880 min Summer	0.075	0.075	0.6	0.2	O K	4320 min Summer	0.050	0.050	0.4	0.1	O K	5760 min Summer	0.045	0.045	0.4	0.1	O K	7200 min Summer	0.041	0.041	0.3	0.1	O K	8640 min Summer	0.038	0.038	0.3	0.0	O K	10080 min Summer	0.036	0.036	0.2	0.0	O K	15 min Winter	0.715	0.715	1.1	5.6	Flood Risk	Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)	15 min Summer	125.353	0.0	17	30 min Summer	84.267	0.0	31	60 min Summer	54.074	0.0	54	120 min Summer	33.506	0.0	86	180 min Summer	24.949	0.0	120	240 min Summer	20.093	0.0	154	360 min Summer	14.773	0.0	220	480 min Summer	11.871	0.0	284	600 min Summer	10.010	0.0	344	720 min Summer	8.703	0.0	400	960 min Summer	6.973	0.0	512	1440 min Summer	5.093	0.0	752	2160 min Summer	3.711	0.0	1108	2880 min Summer	2.961	0.0	1468	4320 min Summer	2.150	0.0	2168	5760 min Summer	1.711	0.0	2856	7200 min Summer	1.432	0.0	3592	8640 min Summer	1.240	0.0	4400	10080 min Summer	1.098	0.0	4992	15 min Winter	125.353	0.0	17
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19 - 21 Silvermills Court Henderson Place Lane Edinburgh EH3 5DG		Havant Road, Emsworth SUDs Drainage Swale 4			
Date 28/02/2017 12:20 File SWALE 4.SRCX		Designed by LK/AC Checked by AMF			
Micro Drainage		Source Control 2015.1			
<u>Summary of Results for 100 year Return Period (+40%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	0.765	0.765	1.1	7.1	Flood Risk
60 min Winter	0.793	0.793	1.1	8.0	Flood Risk
120 min Winter	0.790	0.790	1.1	7.9	Flood Risk
180 min Winter	0.770	0.770	1.1	7.3	Flood Risk
240 min Winter	0.745	0.745	1.1	6.5	Flood Risk
360 min Winter	0.691	0.691	1.1	5.0	O K
480 min Winter	0.635	0.635	1.1	3.7	O K
600 min Winter	0.580	0.580	1.1	2.7	O K
720 min Winter	0.526	0.526	1.1	2.0	O K
960 min Winter	0.374	0.374	0.9	1.3	O K
1440 min Winter	0.181	0.181	0.7	0.6	O K
2160 min Winter	0.061	0.061	0.5	0.1	O K
2880 min Winter	0.050	0.050	0.4	0.1	O K
4320 min Winter	0.043	0.043	0.3	0.1	O K
5760 min Winter	0.038	0.038	0.3	0.0	O K
7200 min Winter	0.035	0.035	0.2	0.0	O K
8640 min Winter	0.032	0.032	0.2	0.0	O K
10080 min Winter	0.030	0.030	0.2	0.0	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)		
30 min Winter	84.267	0.0	31		
60 min Winter	54.074	0.0	58		
120 min Winter	33.506	0.0	94		
180 min Winter	24.949	0.0	132		
240 min Winter	20.093	0.0	168		
360 min Winter	14.773	0.0	236		
480 min Winter	11.871	0.0	300		
600 min Winter	10.010	0.0	356		
720 min Winter	8.703	0.0	404		
960 min Winter	6.973	0.0	522		
1440 min Winter	5.093	0.0	764		
2160 min Winter	3.711	0.0	1088		
2880 min Winter	2.961	0.0	1432		
4320 min Winter	2.150	0.0	2168		
5760 min Winter	1.711	0.0	2928		
7200 min Winter	1.432	0.0	3536		
8640 min Winter	1.240	0.0	4448		
10080 min Winter	1.098	0.0	5112		
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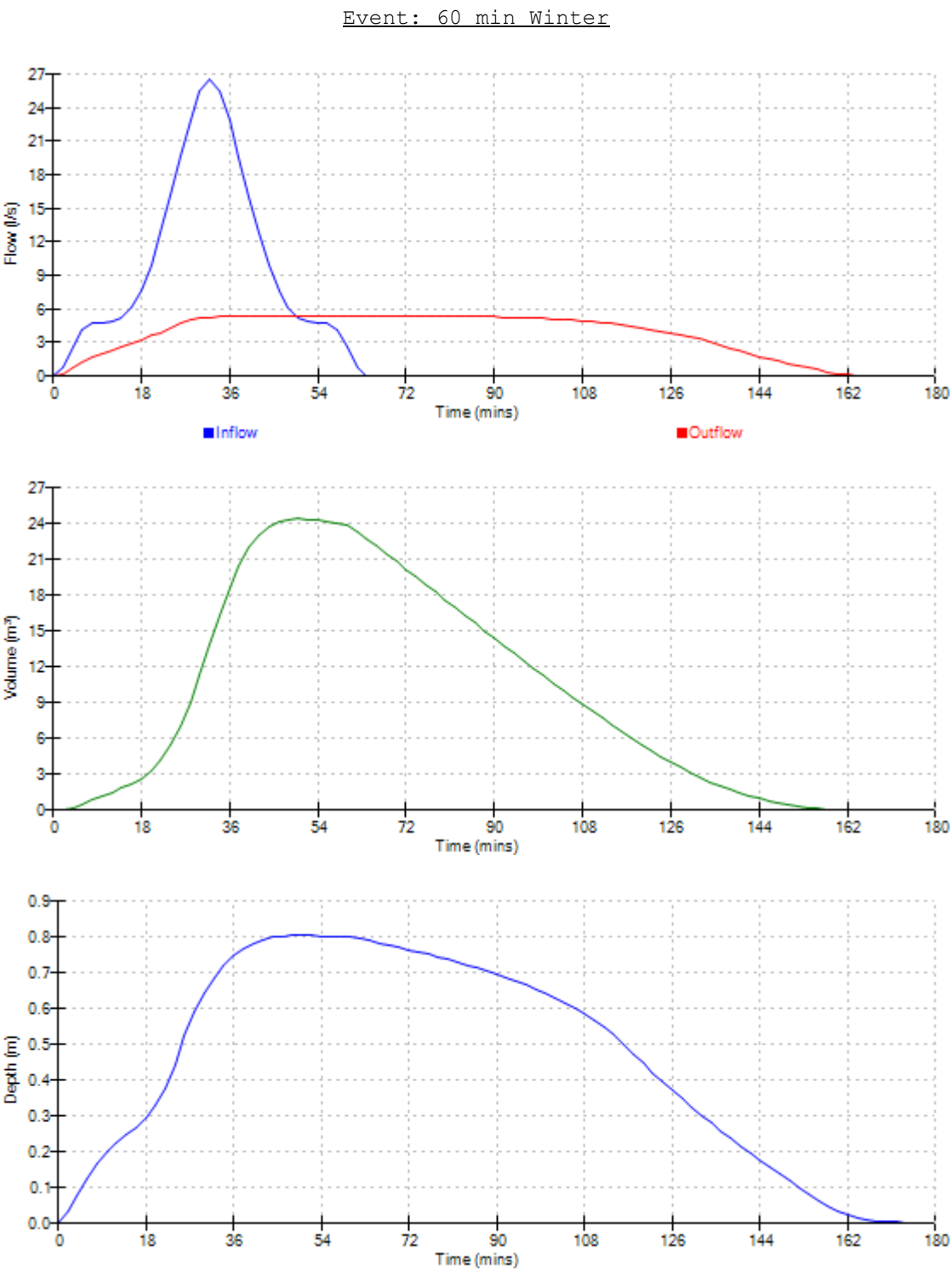
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<u>Model Details</u> Storage is Online Cover Level (m) 1.000 <u>Dry Swale Structure</u> <table> <tr> <td>Infiltration Coefficient Base (m/hr)</td> <td>0.30240</td> <td>Trench Width (m)</td> <td>1.0</td> </tr> <tr> <td>Infiltration Coefficient Side (m/hr)</td> <td>0.30240</td> <td>Trench Length (m)</td> <td>13.0</td> </tr> <tr> <td>Safety Factor</td> <td>2.0</td> <td>Side Slope (1:X)</td> <td>3.0</td> </tr> <tr> <td>Porosity</td> <td>0.30</td> <td>Slope (1:X)</td> <td>200.0</td> </tr> <tr> <td>Invert Level (m)</td> <td>0.000</td> <td>Cap Volume Depth (m)</td> <td>0.800</td> </tr> <tr> <td>Trench Height (m)</td> <td>0.500</td> <td>Cap Infiltration Depth (m)</td> <td>0.500</td> </tr> </table>			Infiltration Coefficient Base (m/hr)	0.30240	Trench Width (m)	1.0	Infiltration Coefficient Side (m/hr)	0.30240	Trench Length (m)	13.0	Safety Factor	2.0	Side Slope (1:X)	3.0	Porosity	0.30	Slope (1:X)	200.0	Invert Level (m)	0.000	Cap Volume Depth (m)	0.800	Trench Height (m)	0.500	Cap Infiltration Depth (m)	0.500
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<u>Summary of Results for 100 year Return Period (+40%)</u> Half Drain Time : 41 minutes. <table><tr><th>Storm Event</th><th>Max Level (m)</th><th>Max Depth (m)</th><th>Max Infiltration (l/s)</th><th>Max Volume (m³)</th><th>Status</th></tr><tr><td>15 min Summer</td><td>0.718</td><td>0.718</td><td>5.3</td><td>16.1</td><td>Flood Risk</td></tr><tr><td>30 min Summer</td><td>0.758</td><td>0.758</td><td>5.4</td><td>19.5</td><td>Flood Risk</td></tr><tr><td>60 min Summer</td><td>0.774</td><td>0.774</td><td>5.4</td><td>21.1</td><td>Flood Risk</td></tr><tr><td>120 min Summer</td><td>0.767</td><td>0.767</td><td>5.4</td><td>20.5</td><td>Flood Risk</td></tr><tr><td>180 min Summer</td><td>0.748</td><td>0.748</td><td>5.4</td><td>18.6</td><td>Flood Risk</td></tr><tr><td>240 min Summer</td><td>0.724</td><td>0.724</td><td>5.3</td><td>16.6</td><td>Flood Risk</td></tr><tr><td>360 min Summer</td><td>0.675</td><td>0.675</td><td>5.2</td><td>13.1</td><td>O K</td></tr><tr><td>480 min Summer</td><td>0.623</td><td>0.623</td><td>5.1</td><td>10.3</td><td>O K</td></tr><tr><td>600 min Summer</td><td>0.571</td><td>0.571</td><td>4.9</td><td>8.3</td><td>O K</td></tr><tr><td>720 min Summer</td><td>0.515</td><td>0.515</td><td>4.6</td><td>6.8</td><td>O K</td></tr><tr><td>960 min Summer</td><td>0.412</td><td>0.412</td><td>4.1</td><td>4.8</td><td>O K</td></tr><tr><td>1440 min Summer</td><td>0.307</td><td>0.307</td><td>3.4</td><td>2.8</td><td>O K</td></tr><tr><td>2160 min Summer</td><td>0.242</td><td>0.242</td><td>2.5</td><td>1.8</td><td>O K</td></tr><tr><td>2880 min Summer</td><td>0.202</td><td>0.202</td><td>2.0</td><td>1.2</td><td>O K</td></tr><tr><td>4320 min Summer</td><td>0.153</td><td>0.153</td><td>1.5</td><td>0.7</td><td>O K</td></tr><tr><td>5760 min Summer</td><td>0.125</td><td>0.125</td><td>1.2</td><td>0.5</td><td>O K</td></tr><tr><td>7200 min Summer</td><td>0.107</td><td>0.107</td><td>1.0</td><td>0.3</td><td>O K</td></tr><tr><td>8640 min Summer</td><td>0.094</td><td>0.094</td><td>0.9</td><td>0.3</td><td>O K</td></tr><tr><td>10080 min Summer</td><td>0.084</td><td>0.084</td><td>0.8</td><td>0.2</td><td>O K</td></tr><tr><td>15 min Winter</td><td>0.746</td><td>0.746</td><td>5.4</td><td>18.4</td><td>Flood Risk</td></tr></table> <table><tr><th>Storm Event</th><th>Rain (mm/hr)</th><th>Flooded Volume (m³)</th><th>Time-Peak (mins)</th></tr><tr><td>15 min Summer</td><td>125.353</td><td>0.0</td><td>16</td></tr><tr><td>30 min Summer</td><td>84.267</td><td>0.0</td><td>30</td></tr><tr><td>60 min Summer</td><td>54.074</td><td>0.0</td><td>46</td></tr><tr><td>120 min Summer</td><td>33.506</td><td>0.0</td><td>80</td></tr><tr><td>180 min Summer</td><td>24.949</td><td>0.0</td><td>114</td></tr><tr><td>240 min Summer</td><td>20.093</td><td>0.0</td><td>148</td></tr><tr><td>360 min Summer</td><td>14.773</td><td>0.0</td><td>210</td></tr><tr><td>480 min Summer</td><td>11.871</td><td>0.0</td><td>270</td></tr><tr><td>600 min Summer</td><td>10.010</td><td>0.0</td><td>328</td></tr><tr><td>720 min Summer</td><td>8.703</td><td>0.0</td><td>386</td></tr><tr><td>960 min Summer</td><td>6.973</td><td>0.0</td><td>504</td></tr><tr><td>1440 min Summer</td><td>5.093</td><td>0.0</td><td>736</td></tr><tr><td>2160 min Summer</td><td>3.711</td><td>0.0</td><td>1100</td></tr><tr><td>2880 min Summer</td><td>2.961</td><td>0.0</td><td>1468</td></tr><tr><td>4320 min Summer</td><td>2.150</td><td>0.0</td><td>2200</td></tr><tr><td>5760 min Summer</td><td>1.711</td><td>0.0</td><td>2880</td></tr><tr><td>7200 min Summer</td><td>1.432</td><td>0.0</td><td>3584</td></tr><tr><td>8640 min Summer</td><td>1.240</td><td>0.0</td><td>4336</td></tr><tr><td>10080 min Summer</td><td>1.098</td><td>0.0</td><td>5136</td></tr><tr><td>15 min Winter</td><td>125.353</td><td>0.0</td><td>17</td></tr></table>						Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status	15 min Summer	0.718	0.718	5.3	16.1	Flood Risk	30 min Summer	0.758	0.758	5.4	19.5	Flood Risk	60 min Summer	0.774	0.774	5.4	21.1	Flood Risk	120 min Summer	0.767	0.767	5.4	20.5	Flood Risk	180 min Summer	0.748	0.748	5.4	18.6	Flood Risk	240 min Summer	0.724	0.724	5.3	16.6	Flood Risk	360 min Summer	0.675	0.675	5.2	13.1	O K	480 min Summer	0.623	0.623	5.1	10.3	O K	600 min Summer	0.571	0.571	4.9	8.3	O K	720 min Summer	0.515	0.515	4.6	6.8	O K	960 min Summer	0.412	0.412	4.1	4.8	O K	1440 min Summer	0.307	0.307	3.4	2.8	O K	2160 min Summer	0.242	0.242	2.5	1.8	O K	2880 min Summer	0.202	0.202	2.0	1.2	O K	4320 min Summer	0.153	0.153	1.5	0.7	O K	5760 min Summer	0.125	0.125	1.2	0.5	O K	7200 min Summer	0.107	0.107	1.0	0.3	O K	8640 min Summer	0.094	0.094	0.9	0.3	O K	10080 min Summer	0.084	0.084	0.8	0.2	O K	15 min Winter	0.746	0.746	5.4	18.4	Flood Risk	Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)	15 min Summer	125.353	0.0	16	30 min Summer	84.267	0.0	30	60 min Summer	54.074	0.0	46	120 min Summer	33.506	0.0	80	180 min Summer	24.949	0.0	114	240 min Summer	20.093	0.0	148	360 min Summer	14.773	0.0	210	480 min Summer	11.871	0.0	270	600 min Summer	10.010	0.0	328	720 min Summer	8.703	0.0	386	960 min Summer	6.973	0.0	504	1440 min Summer	5.093	0.0	736	2160 min Summer	3.711	0.0	1100	2880 min Summer	2.961	0.0	1468	4320 min Summer	2.150	0.0	2200	5760 min Summer	1.711	0.0	2880	7200 min Summer	1.432	0.0	3584	8640 min Summer	1.240	0.0	4336	10080 min Summer	1.098	0.0	5136	15 min Winter	125.353	0.0	17
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19 - 21 Silvermills Court Henderson Place Lane Edinburgh EH3 5DG		Havant Road, Emsworth SUDs Drainage Swale 5			
Date 28/02/2017 13:01 File SWALE 5.SRCX		Designed by LK/AC Checked by AMF			
Micro Drainage		Source Control 2015.1			
<u>Summary of Results for 100 year Return Period (+40%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	0.788	0.788	5.4	22.6	Flood Risk
60 min Winter	0.804	0.804	5.4	24.4	Flood Risk
120 min Winter	0.791	0.791	5.4	23.0	Flood Risk
180 min Winter	0.763	0.763	5.4	20.0	Flood Risk
240 min Winter	0.728	0.728	5.3	16.9	Flood Risk
360 min Winter	0.651	0.651	5.2	11.7	O K
480 min Winter	0.568	0.568	4.9	8.2	O K
600 min Winter	0.478	0.478	4.4	6.1	O K
720 min Winter	0.401	0.401	4.0	4.6	O K
960 min Winter	0.310	0.310	3.4	2.9	O K
1440 min Winter	0.242	0.242	2.5	1.8	O K
2160 min Winter	0.186	0.186	1.9	1.0	O K
2880 min Winter	0.153	0.153	1.5	0.7	O K
4320 min Winter	0.115	0.115	1.1	0.4	O K
5760 min Winter	0.093	0.093	0.9	0.3	O K
7200 min Winter	0.079	0.079	0.7	0.2	O K
8640 min Winter	0.069	0.069	0.6	0.1	O K
10080 min Winter	0.062	0.062	0.6	0.1	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)		
30 min Winter	84.267	0.0	30		
60 min Winter	54.074	0.0	50		
120 min Winter	33.506	0.0	88		
180 min Winter	24.949	0.0	124		
240 min Winter	20.093	0.0	158		
360 min Winter	14.773	0.0	220		
480 min Winter	11.871	0.0	278		
600 min Winter	10.010	0.0	336		
720 min Winter	8.703	0.0	396		
960 min Winter	6.973	0.0	500		
1440 min Winter	5.093	0.0	736		
2160 min Winter	3.711	0.0	1100		
2880 min Winter	2.961	0.0	1468		
4320 min Winter	2.150	0.0	2156		
5760 min Winter	1.711	0.0	2888		
7200 min Winter	1.432	0.0	3664		
8640 min Winter	1.240	0.0	4288		
10080 min Winter	1.098	0.0	5088		
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19 - 21 Silvermills Court Henderson Place Lane Edinburgh EH3 5DG	Havant Road, Emsworth SUDs Drainage Swale 5																									
Date 28/02/2017 13:01 File SWALE 5.SRCX	Designed by LK/AC Checked by AMF																									
Micro Drainage Source Control 2015.1																										
<u>Model Details</u> Storage is Online Cover Level (m) 1.000 <u>Dry Swale Structure</u> <table> <tr> <td>Infiltration Coefficient Base (m/hr)</td> <td>0.30240</td> <td>Trench Width (m)</td> <td>1.0</td> </tr> <tr> <td>Infiltration Coefficient Side (m/hr)</td> <td>0.30240</td> <td>Trench Length (m)</td> <td>64.0</td> </tr> <tr> <td>Safety Factor</td> <td>2.0</td> <td>Side Slope (1:X)</td> <td>3.0</td> </tr> <tr> <td>Porosity</td> <td>0.30</td> <td>Slope (1:X)</td> <td>200.0</td> </tr> <tr> <td>Invert Level (m)</td> <td>0.000</td> <td>Cap Volume Depth (m)</td> <td>0.800</td> </tr> <tr> <td>Trench Height (m)</td> <td>0.500</td> <td>Cap Infiltration Depth (m)</td> <td>0.500</td> </tr> </table>			Infiltration Coefficient Base (m/hr)	0.30240	Trench Width (m)	1.0	Infiltration Coefficient Side (m/hr)	0.30240	Trench Length (m)	64.0	Safety Factor	2.0	Side Slope (1:X)	3.0	Porosity	0.30	Slope (1:X)	200.0	Invert Level (m)	0.000	Cap Volume Depth (m)	0.800	Trench Height (m)	0.500	Cap Infiltration Depth (m)	0.500
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<u>Summary of Results for 100 year Return Period (+40%)</u> Half Drain Time : 175 minutes. <table><tr><th>Storm Event</th><th>Max Level (m)</th><th>Max Depth (m)</th><th>Max Infiltration (l/s)</th><th>Max Volume (m³)</th><th>Status</th></tr><tr><td>15 min Summer</td><td>0.686</td><td>0.686</td><td>1.7</td><td>18.8</td><td>O K</td></tr><tr><td>30 min Summer</td><td>0.738</td><td>0.738</td><td>1.7</td><td>23.8</td><td>Flood Risk</td></tr><tr><td>60 min Summer</td><td>0.777</td><td>0.777</td><td>1.7</td><td>27.9</td><td>Flood Risk</td></tr><tr><td>120 min Summer</td><td>0.792</td><td>0.792</td><td>1.7</td><td>29.6</td><td>Flood Risk</td></tr><tr><td>180 min Summer</td><td>0.787</td><td>0.787</td><td>1.7</td><td>29.0</td><td>Flood Risk</td></tr><tr><td>240 min Summer</td><td>0.778</td><td>0.778</td><td>1.7</td><td>28.1</td><td>Flood Risk</td></tr><tr><td>360 min Summer</td><td>0.760</td><td>0.760</td><td>1.7</td><td>26.1</td><td>Flood Risk</td></tr><tr><td>480 min Summer</td><td>0.742</td><td>0.742</td><td>1.7</td><td>24.2</td><td>Flood Risk</td></tr><tr><td>600 min Summer</td><td>0.725</td><td>0.725</td><td>1.7</td><td>22.4</td><td>Flood Risk</td></tr><tr><td>720 min Summer</td><td>0.707</td><td>0.707</td><td>1.7</td><td>20.7</td><td>Flood Risk</td></tr><tr><td>960 min Summer</td><td>0.673</td><td>0.673</td><td>1.7</td><td>17.6</td><td>O K</td></tr><tr><td>1440 min Summer</td><td>0.602</td><td>0.602</td><td>1.7</td><td>12.5</td><td>O K</td></tr><tr><td>2160 min Summer</td><td>0.456</td><td>0.456</td><td>1.6</td><td>7.8</td><td>O K</td></tr><tr><td>2880 min Summer</td><td>0.318</td><td>0.318</td><td>1.4</td><td>4.9</td><td>O K</td></tr><tr><td>4320 min Summer</td><td>0.178</td><td>0.178</td><td>1.2</td><td>1.9</td><td>O K</td></tr><tr><td>5760 min Summer</td><td>0.144</td><td>0.144</td><td>1.0</td><td>1.3</td><td>O K</td></tr><tr><td>7200 min Summer</td><td>0.122</td><td>0.122</td><td>0.8</td><td>0.9</td><td>O K</td></tr><tr><td>8640 min Summer</td><td>0.106</td><td>0.106</td><td>0.7</td><td>0.7</td><td>O K</td></tr><tr><td>10080 min Summer</td><td>0.094</td><td>0.094</td><td>0.6</td><td>0.5</td><td>O K</td></tr><tr><td>15 min Winter</td><td>0.712</td><td>0.712</td><td>1.7</td><td>21.2</td><td>Flood Risk</td></tr></table> <table><tr><th>Storm Event</th><th>Rain (mm/hr)</th><th>Flooded Volume (m³)</th><th>Time-Peak (mins)</th></tr><tr><td>15 min Summer</td><td>138.153</td><td>0.0</td><td>18</td></tr><tr><td>30 min Summer</td><td>90.705</td><td>0.0</td><td>33</td></tr><tr><td>60 min Summer</td><td>56.713</td><td>0.0</td><td>62</td></tr><tr><td>120 min Summer</td><td>34.246</td><td>0.0</td><td>120</td></tr><tr><td>180 min Summer</td><td>25.149</td><td>0.0</td><td>152</td></tr><tr><td>240 min Summer</td><td>20.078</td><td>0.0</td><td>182</td></tr><tr><td>360 min Summer</td><td>14.585</td><td>0.0</td><td>248</td></tr><tr><td>480 min Summer</td><td>11.622</td><td>0.0</td><td>316</td></tr><tr><td>600 min Summer</td><td>9.738</td><td>0.0</td><td>384</td></tr><tr><td>720 min Summer</td><td>8.424</td><td>0.0</td><td>450</td></tr><tr><td>960 min Summer</td><td>6.697</td><td>0.0</td><td>578</td></tr><tr><td>1440 min Summer</td><td>4.839</td><td>0.0</td><td>824</td></tr><tr><td>2160 min Summer</td><td>3.490</td><td>0.0</td><td>1172</td></tr><tr><td>2880 min Summer</td><td>2.766</td><td>0.0</td><td>1528</td></tr><tr><td>4320 min Summer</td><td>1.989</td><td>0.0</td><td>2204</td></tr><tr><td>5760 min Summer</td><td>1.573</td><td>0.0</td><td>2936</td></tr><tr><td>7200 min Summer</td><td>1.311</td><td>0.0</td><td>3672</td></tr><tr><td>8640 min Summer</td><td>1.129</td><td>0.0</td><td>4392</td></tr><tr><td>10080 min Summer</td><td>0.994</td><td>0.0</td><td>5072</td></tr><tr><td>15 min Winter</td><td>138.153</td><td>0.0</td><td>18</td></tr></table>						Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status	15 min Summer	0.686	0.686	1.7	18.8	O K	30 min Summer	0.738	0.738	1.7	23.8	Flood Risk	60 min Summer	0.777	0.777	1.7	27.9	Flood Risk	120 min Summer	0.792	0.792	1.7	29.6	Flood Risk	180 min Summer	0.787	0.787	1.7	29.0	Flood Risk	240 min Summer	0.778	0.778	1.7	28.1	Flood Risk	360 min Summer	0.760	0.760	1.7	26.1	Flood Risk	480 min Summer	0.742	0.742	1.7	24.2	Flood Risk	600 min Summer	0.725	0.725	1.7	22.4	Flood Risk	720 min Summer	0.707	0.707	1.7	20.7	Flood Risk	960 min Summer	0.673	0.673	1.7	17.6	O K	1440 min Summer	0.602	0.602	1.7	12.5	O K	2160 min Summer	0.456	0.456	1.6	7.8	O K	2880 min Summer	0.318	0.318	1.4	4.9	O K	4320 min Summer	0.178	0.178	1.2	1.9	O K	5760 min Summer	0.144	0.144	1.0	1.3	O K	7200 min Summer	0.122	0.122	0.8	0.9	O K	8640 min Summer	0.106	0.106	0.7	0.7	O K	10080 min Summer	0.094	0.094	0.6	0.5	O K	15 min Winter	0.712	0.712	1.7	21.2	Flood Risk	Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)	15 min Summer	138.153	0.0	18	30 min Summer	90.705	0.0	33	60 min Summer	56.713	0.0	62	120 min Summer	34.246	0.0	120	180 min Summer	25.149	0.0	152	240 min Summer	20.078	0.0	182	360 min Summer	14.585	0.0	248	480 min Summer	11.622	0.0	316	600 min Summer	9.738	0.0	384	720 min Summer	8.424	0.0	450	960 min Summer	6.697	0.0	578	1440 min Summer	4.839	0.0	824	2160 min Summer	3.490	0.0	1172	2880 min Summer	2.766	0.0	1528	4320 min Summer	1.989	0.0	2204	5760 min Summer	1.573	0.0	2936	7200 min Summer	1.311	0.0	3672	8640 min Summer	1.129	0.0	4392	10080 min Summer	0.994	0.0	5072	15 min Winter	138.153	0.0	18
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Cundall, Johnston & Partners				Page 2	
19 - 21 Silvermills Court Henderson Place Lane Edinburgh EH3 5DG		Havant Road, Emsworth SUDs Drainage Swale 6			
Date 28/02/2017 14:35 File SWALE 6.SRCX		Designed by LK/AC Checked by AMF			
Micro Drainage		Source Control 2015.1			
<u>Summary of Results for 100 year Return Period (+40%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	0.769	0.769	1.7	27.0	Flood Risk
60 min Winter	0.812	0.812	1.7	31.8	Flood Risk
120 min Winter	0.838	0.838	1.7	34.5	Flood Risk
180 min Winter	0.834	0.834	1.7	34.1	Flood Risk
240 min Winter	0.820	0.820	1.7	32.7	Flood Risk
360 min Winter	0.797	0.797	1.7	30.1	Flood Risk
480 min Winter	0.772	0.772	1.7	27.4	Flood Risk
600 min Winter	0.747	0.747	1.7	24.7	Flood Risk
720 min Winter	0.721	0.721	1.7	22.1	Flood Risk
960 min Winter	0.671	0.671	1.7	17.4	O K
1440 min Winter	0.557	0.557	1.7	10.4	O K
2160 min Winter	0.323	0.323	1.4	5.0	O K
2880 min Winter	0.183	0.183	1.2	2.0	O K
4320 min Winter	0.133	0.133	0.9	1.1	O K
5760 min Winter	0.107	0.107	0.7	0.7	O K
7200 min Winter	0.090	0.090	0.6	0.5	O K
8640 min Winter	0.078	0.078	0.5	0.4	O K
10080 min Winter	0.069	0.069	0.5	0.3	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)		
30 min Winter	90.705	0.0	32		
60 min Winter	56.713	0.0	60		
120 min Winter	34.246	0.0	118		
180 min Winter	25.149	0.0	172		
240 min Winter	20.078	0.0	196		
360 min Winter	14.585	0.0	270		
480 min Winter	11.622	0.0	346		
600 min Winter	9.738	0.0	418		
720 min Winter	8.424	0.0	486		
960 min Winter	6.697	0.0	618		
1440 min Winter	4.839	0.0	852		
2160 min Winter	3.490	0.0	1212		
2880 min Winter	2.766	0.0	1500		
4320 min Winter	1.989	0.0	2204		
5760 min Winter	1.573	0.0	2936		
7200 min Winter	1.311	0.0	3672		
8640 min Winter	1.129	0.0	4400		
10080 min Winter	0.994	0.0	5136		
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19 - 21 Silvermills Court Henderson Place Lane Edinburgh EH3 5DG	Havant Road, Emsworth SUDs Drainage Swale 6	
Date 28/02/2017 14:35 File SWALE 6.SRCX	Designed by LK/AC Checked by AMF	
Micro Drainage	Source Control 2015.1	

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	20.000	Shortest Storm (mins)	15
Ratio R	0.400	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

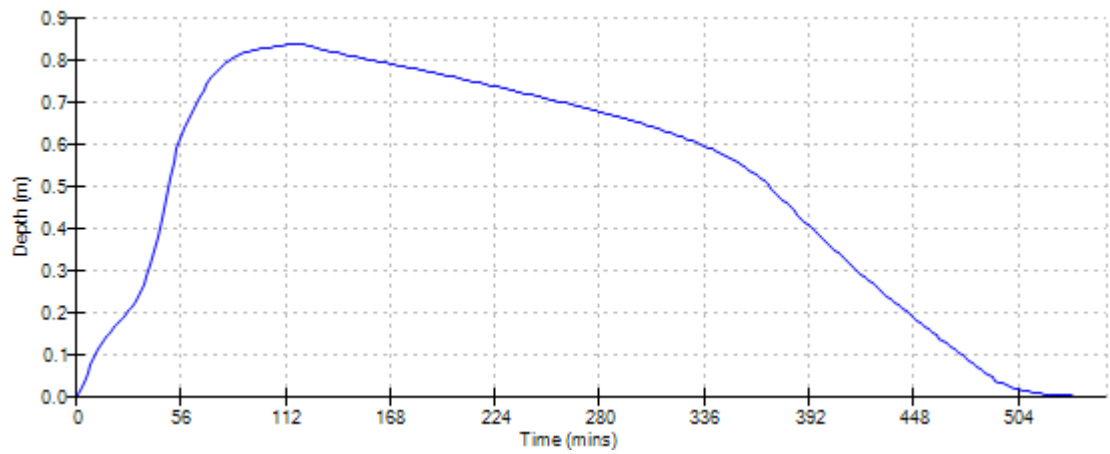
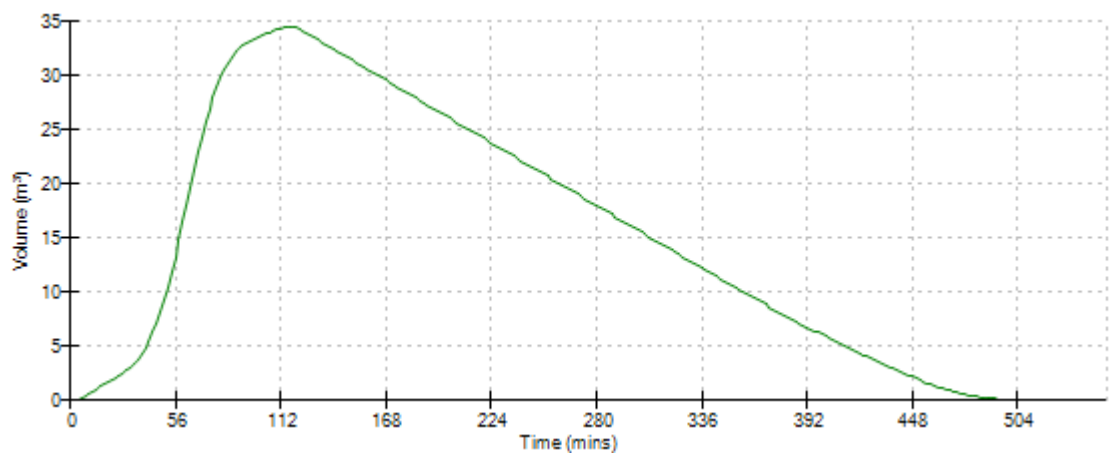
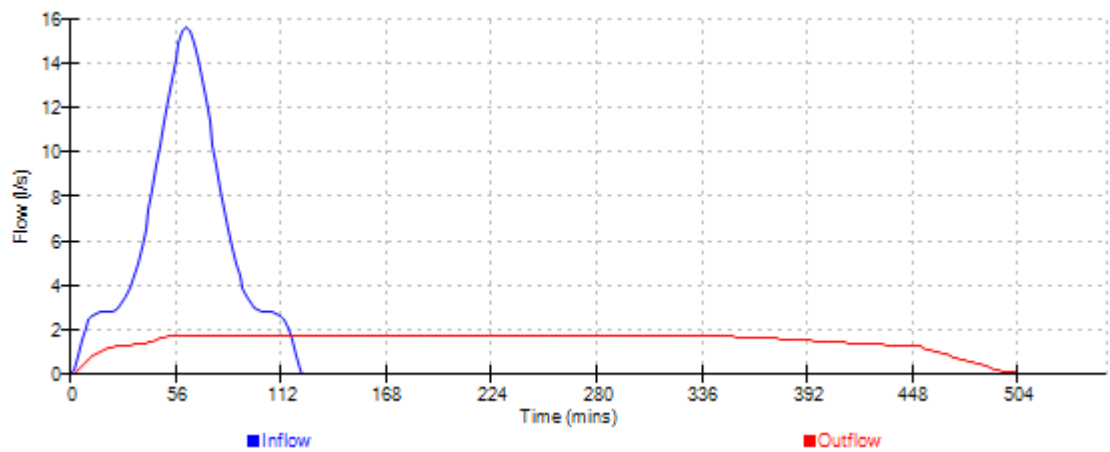
Time Area Diagram

Total Area (ha) 0.078

Time (mins) Area			Time (mins) Area		
From:	To:	(ha)	From:	To:	(ha)
0	2	0.039	2	4	0.039

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19 - 21 Silvermills Court Henderson Place Lane Edinburgh EH3 5DG	Havant Road, Emsworth SUDs Drainage Swale 6																									
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Micro Drainage Source Control 2015.1																										
<u>Model Details</u> Storage is Online Cover Level (m) 1.000 <u>Dry Swale Structure</u> <table> <tr> <td>Infiltration Coefficient Base (m/hr)</td> <td>0.11520</td> <td>Trench Width (m)</td> <td>2.0</td> </tr> <tr> <td>Infiltration Coefficient Side (m/hr)</td> <td>0.11520</td> <td>Trench Length (m)</td> <td>35.2</td> </tr> <tr> <td>Safety Factor</td> <td>2.0</td> <td>Side Slope (1:X)</td> <td>3.0</td> </tr> <tr> <td>Porosity</td> <td>0.30</td> <td>Slope (1:X)</td> <td>200.0</td> </tr> <tr> <td>Invert Level (m)</td> <td>0.000</td> <td>Cap Volume Depth (m)</td> <td>0.800</td> </tr> <tr> <td>Trench Height (m)</td> <td>0.500</td> <td>Cap Infiltration Depth (m)</td> <td>0.500</td> </tr> </table>			Infiltration Coefficient Base (m/hr)	0.11520	Trench Width (m)	2.0	Infiltration Coefficient Side (m/hr)	0.11520	Trench Length (m)	35.2	Safety Factor	2.0	Side Slope (1:X)	3.0	Porosity	0.30	Slope (1:X)	200.0	Invert Level (m)	0.000	Cap Volume Depth (m)	0.800	Trench Height (m)	0.500	Cap Infiltration Depth (m)	0.500
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Trench Height (m)	0.500	Cap Infiltration Depth (m)	0.500																							
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Event: 120 min Winter



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Micro Drainage		Source Control 2015.1																																																																																																																																																																																																																					
<u>Summary of Results for 100 year Return Period (+40%)</u> Half Drain Time : 63 minutes. <table><tr><th>Storm Event</th><th>Max Level (m)</th><th>Max Depth (m)</th><th>Max Infiltration (l/s)</th><th>Max Volume (m³)</th><th>Status</th></tr><tr><td>15 min Summer</td><td>0.623</td><td>0.623</td><td>3.6</td><td>15.9</td><td>O K</td></tr><tr><td>30 min Summer</td><td>0.666</td><td>0.666</td><td>3.6</td><td>19.3</td><td>O K</td></tr><tr><td>60 min Summer</td><td>0.681</td><td>0.681</td><td>3.6</td><td>20.7</td><td>O K</td></tr><tr><td>120 min Summer</td><td>0.675</td><td>0.675</td><td>3.6</td><td>20.1</td><td>O K</td></tr><tr><td>180 min Summer</td><td>0.658</td><td>0.658</td><td>3.6</td><td>18.6</td><td>O K</td></tr><tr><td>240 min Summer</td><td>0.637</td><td>0.637</td><td>3.6</td><td>16.9</td><td>O K</td></tr><tr><td>360 min Summer</td><td>0.592</td><td>0.592</td><td>3.5</td><td>13.9</td><td>O K</td></tr><tr><td>480 min Summer</td><td>0.541</td><td>0.541</td><td>3.5</td><td>11.5</td><td>O K</td></tr><tr><td>600 min Summer</td><td>0.476</td><td>0.476</td><td>3.3</td><td>9.6</td><td>O K</td></tr><tr><td>720 min Summer</td><td>0.414</td><td>0.414</td><td>3.2</td><td>8.0</td><td>O K</td></tr><tr><td>960 min Summer</td><td>0.319</td><td>0.319</td><td>2.9</td><td>5.5</td><td>O K</td></tr><tr><td>1440 min Summer</td><td>0.215</td><td>0.215</td><td>2.6</td><td>2.8</td><td>O K</td></tr><tr><td>2160 min Summer</td><td>0.167</td><td>0.167</td><td>2.0</td><td>1.7</td><td>O K</td></tr><tr><td>2880 min Summer</td><td>0.137</td><td>0.137</td><td>1.6</td><td>1.1</td><td>O K</td></tr><tr><td>4320 min Summer</td><td>0.101</td><td>0.101</td><td>1.2</td><td>0.6</td><td>O K</td></tr><tr><td>5760 min Summer</td><td>0.081</td><td>0.081</td><td>0.9</td><td>0.4</td><td>O K</td></tr><tr><td>7200 min Summer</td><td>0.068</td><td>0.068</td><td>0.8</td><td>0.3</td><td>O K</td></tr><tr><td>8640 min Summer</td><td>0.059</td><td>0.059</td><td>0.7</td><td>0.2</td><td>O K</td></tr><tr><td>10080 min Summer</td><td>0.052</td><td>0.052</td><td>0.6</td><td>0.2</td><td>O K</td></tr><tr><td>15 min Winter</td><td>0.652</td><td>0.652</td><td>3.6</td><td>18.1</td><td>O K</td></tr></table> <table><tr><th>Storm Event</th><th>Rain (mm/hr)</th><th>Flooded Volume (m³)</th><th>Time-Peak (mins)</th></tr><tr><td>15 min Summer</td><td>138.153</td><td>0.0</td><td>17</td></tr><tr><td>30 min Summer</td><td>90.705</td><td>0.0</td><td>31</td></tr><tr><td>60 min Summer</td><td>56.713</td><td>0.0</td><td>52</td></tr><tr><td>120 min Summer</td><td>34.246</td><td>0.0</td><td>84</td></tr><tr><td>180 min Summer</td><td>25.149</td><td>0.0</td><td>118</td></tr><tr><td>240 min Summer</td><td>20.078</td><td>0.0</td><td>152</td></tr><tr><td>360 min Summer</td><td>14.585</td><td>0.0</td><td>218</td></tr><tr><td>480 min Summer</td><td>11.622</td><td>0.0</td><td>280</td></tr><tr><td>600 min Summer</td><td>9.738</td><td>0.0</td><td>342</td></tr><tr><td>720 min Summer</td><td>8.424</td><td>0.0</td><td>402</td></tr><tr><td>960 min Summer</td><td>6.697</td><td>0.0</td><td>520</td></tr><tr><td>1440 min Summer</td><td>4.839</td><td>0.0</td><td>738</td></tr><tr><td>2160 min Summer</td><td>3.490</td><td>0.0</td><td>1104</td></tr><tr><td>2880 min Summer</td><td>2.766</td><td>0.0</td><td>1468</td></tr><tr><td>4320 min Summer</td><td>1.989</td><td>0.0</td><td>2200</td></tr><tr><td>5760 min Summer</td><td>1.573</td><td>0.0</td><td>2936</td></tr><tr><td>7200 min Summer</td><td>1.311</td><td>0.0</td><td>3608</td></tr><tr><td>8640 min Summer</td><td>1.129</td><td>0.0</td><td>4376</td></tr><tr><td>10080 min Summer</td><td>0.994</td><td>0.0</td><td>5040</td></tr><tr><td>15 min Winter</td><td>138.153</td><td>0.0</td><td>17</td></tr></table>						Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status	15 min Summer	0.623	0.623	3.6	15.9	O K	30 min Summer	0.666	0.666	3.6	19.3	O K	60 min Summer	0.681	0.681	3.6	20.7	O K	120 min Summer	0.675	0.675	3.6	20.1	O K	180 min Summer	0.658	0.658	3.6	18.6	O K	240 min Summer	0.637	0.637	3.6	16.9	O K	360 min Summer	0.592	0.592	3.5	13.9	O K	480 min Summer	0.541	0.541	3.5	11.5	O K	600 min Summer	0.476	0.476	3.3	9.6	O K	720 min Summer	0.414	0.414	3.2	8.0	O K	960 min Summer	0.319	0.319	2.9	5.5	O K	1440 min Summer	0.215	0.215	2.6	2.8	O K	2160 min Summer	0.167	0.167	2.0	1.7	O K	2880 min Summer	0.137	0.137	1.6	1.1	O K	4320 min Summer	0.101	0.101	1.2	0.6	O K	5760 min Summer	0.081	0.081	0.9	0.4	O K	7200 min Summer	0.068	0.068	0.8	0.3	O K	8640 min Summer	0.059	0.059	0.7	0.2	O K	10080 min Summer	0.052	0.052	0.6	0.2	O K	15 min Winter	0.652	0.652	3.6	18.1	O K	Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)	15 min Summer	138.153	0.0	17	30 min Summer	90.705	0.0	31	60 min Summer	56.713	0.0	52	120 min Summer	34.246	0.0	84	180 min Summer	25.149	0.0	118	240 min Summer	20.078	0.0	152	360 min Summer	14.585	0.0	218	480 min Summer	11.622	0.0	280	600 min Summer	9.738	0.0	342	720 min Summer	8.424	0.0	402	960 min Summer	6.697	0.0	520	1440 min Summer	4.839	0.0	738	2160 min Summer	3.490	0.0	1104	2880 min Summer	2.766	0.0	1468	4320 min Summer	1.989	0.0	2200	5760 min Summer	1.573	0.0	2936	7200 min Summer	1.311	0.0	3608	8640 min Summer	1.129	0.0	4376	10080 min Summer	0.994	0.0	5040	15 min Winter	138.153	0.0	17
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19 - 21 Silvermills Court Henderson Place Lane Edinburgh EH3 5DG		Havant Road, Emsworth SUDs Drainage Swale 7			
Date 28/02/2017 14:38 File SWALE 7.SRCX		Designed by LK/AC Checked by AMF			
Micro Drainage		Source Control 2015.1			
<u>Summary of Results for 100 year Return Period (+40%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	0.696	0.696	3.6	22.2	O K
60 min Winter	0.714	0.714	3.6	24.1	Flood Risk
120 min Winter	0.705	0.705	3.6	23.1	Flood Risk
180 min Winter	0.683	0.683	3.6	20.8	O K
240 min Winter	0.655	0.655	3.6	18.3	O K
360 min Winter	0.591	0.591	3.5	13.9	O K
480 min Winter	0.510	0.510	3.4	10.5	O K
600 min Winter	0.412	0.412	3.1	7.9	O K
720 min Winter	0.333	0.333	2.9	5.8	O K
960 min Winter	0.227	0.227	2.7	3.1	O K
1440 min Winter	0.169	0.169	2.0	1.7	O K
2160 min Winter	0.126	0.126	1.5	0.9	O K
2880 min Winter	0.101	0.101	1.2	0.6	O K
4320 min Winter	0.074	0.074	0.8	0.3	O K
5760 min Winter	0.059	0.059	0.7	0.2	O K
7200 min Winter	0.050	0.050	0.6	0.1	O K
8640 min Winter	0.046	0.046	0.5	0.1	O K
10080 min Winter	0.043	0.043	0.4	0.1	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)		
30 min Winter	90.705	0.0	31		
60 min Winter	56.713	0.0	58		
120 min Winter	34.246	0.0	92		
180 min Winter	25.149	0.0	130		
240 min Winter	20.078	0.0	166		
360 min Winter	14.585	0.0	232		
480 min Winter	11.622	0.0	294		
600 min Winter	9.738	0.0	356		
720 min Winter	8.424	0.0	414		
960 min Winter	6.697	0.0	518		
1440 min Winter	4.839	0.0	740		
2160 min Winter	3.490	0.0	1100		
2880 min Winter	2.766	0.0	1452		
4320 min Winter	1.989	0.0	2200		
5760 min Winter	1.573	0.0	2840		
7200 min Winter	1.311	0.0	3560		
8640 min Winter	1.129	0.0	4344		
10080 min Winter	0.994	0.0	5048		
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19 - 21 Silvermills Court Henderson Place Lane Edinburgh EH3 5DG	Havant Road, Emsworth SUDs Drainage Swale 7	
Date 28/02/2017 14:38 File SWALE 7.SRCX	Designed by LK/AC Checked by AMF	
Micro Drainage Source Control 2015.1		

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	20.000	Shortest Storm (mins)	15
Ratio R	0.400	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

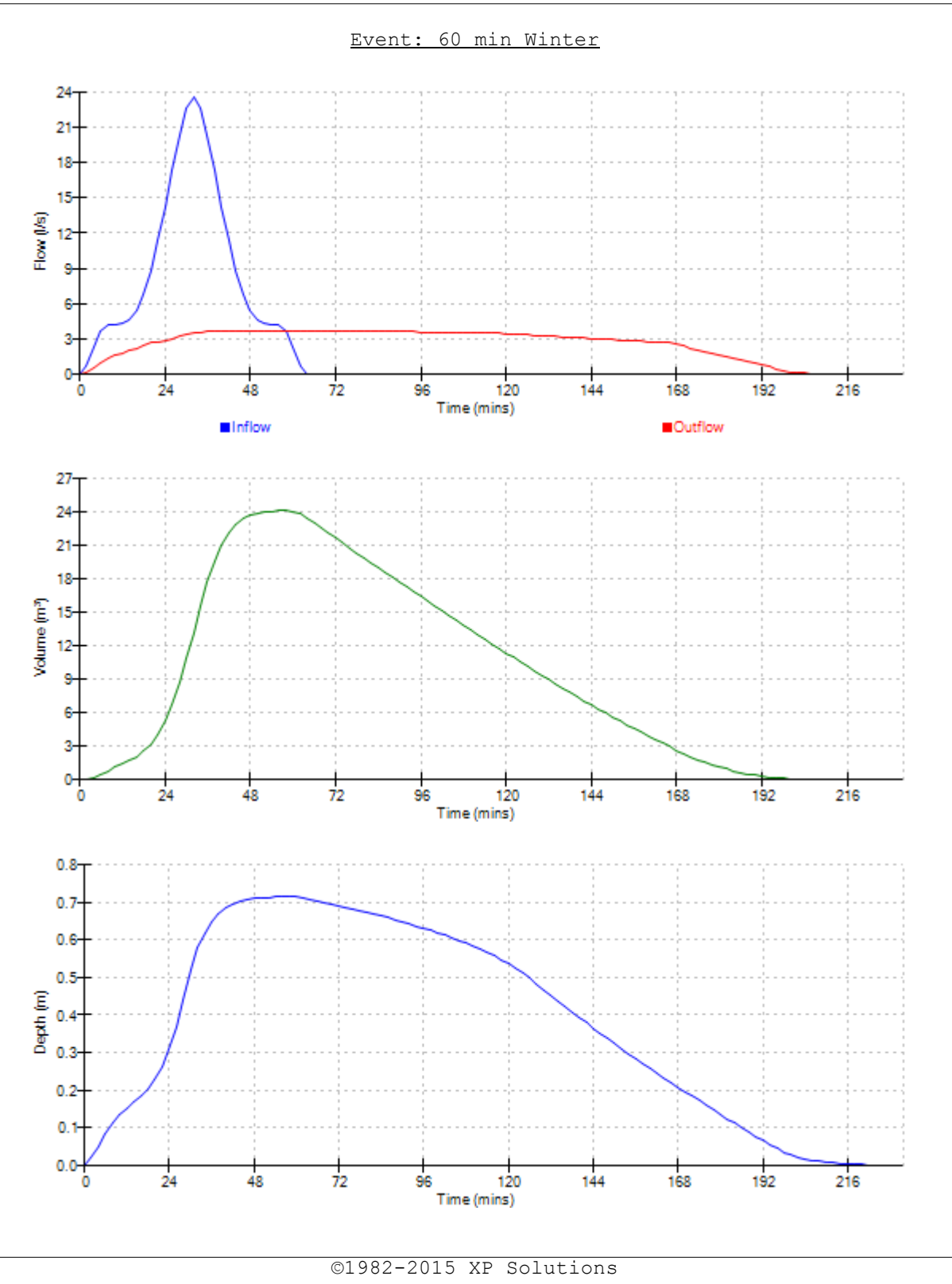
Time Area Diagram

Total Area (ha) 0.072

Time (mins)	Area	Time (mins)	Area
From:	To: (ha)	From:	To: (ha)
0	2 0.036	2	4 0.036

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19 - 21 Silvermills Court Henderson Place Lane Edinburgh EH3 5DG	Havant Road, Emsworth SUDs Drainage Swale 7																									
Date 28/02/2017 14:38 File SWALE 7.SRCX	Designed by LK/AC Checked by AMF																									
Micro Drainage Source Control 2015.1																										
<u>Model Details</u> Storage is Online Cover Level (m) 1.000 <u>Dry Swale Structure</u> <table> <tr> <td>Infiltration Coefficient Base (m/hr)</td> <td>0.19800</td> <td>Trench Width (m)</td> <td>2.0</td> </tr> <tr> <td>Infiltration Coefficient Side (m/hr)</td> <td>0.19800</td> <td>Trench Length (m)</td> <td>43.4</td> </tr> <tr> <td>Safety Factor</td> <td>2.0</td> <td>Side Slope (1:X)</td> <td>3.0</td> </tr> <tr> <td>Porosity</td> <td>0.30</td> <td>Slope (1:X)</td> <td>200.0</td> </tr> <tr> <td>Invert Level (m)</td> <td>0.000</td> <td>Cap Volume Depth (m)</td> <td>0.800</td> </tr> <tr> <td>Trench Height (m)</td> <td>0.500</td> <td>Cap Infiltration Depth (m)</td> <td>0.500</td> </tr> </table>			Infiltration Coefficient Base (m/hr)	0.19800	Trench Width (m)	2.0	Infiltration Coefficient Side (m/hr)	0.19800	Trench Length (m)	43.4	Safety Factor	2.0	Side Slope (1:X)	3.0	Porosity	0.30	Slope (1:X)	200.0	Invert Level (m)	0.000	Cap Volume Depth (m)	0.800	Trench Height (m)	0.500	Cap Infiltration Depth (m)	0.500
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<u>Summary of Results for 100 year Return Period (+40%)</u> Half Drain Time : 57 minutes. <table><tr><th>Storm Event</th><th>Max Level (m)</th><th>Max Depth (m)</th><th>Max Infiltration (l/s)</th><th>Max Volume (m³)</th><th>Status</th></tr><tr><td>15 min Summer</td><td>1.213</td><td>1.213</td><td>2.4</td><td>9.9</td><td>O K</td></tr><tr><td>30 min Summer</td><td>1.488</td><td>1.488</td><td>2.7</td><td>12.2</td><td>O K</td></tr><tr><td>60 min Summer</td><td>1.647</td><td>1.647</td><td>2.9</td><td>13.5</td><td>O K</td></tr><tr><td>120 min Summer</td><td>1.682</td><td>1.682</td><td>3.0</td><td>13.8</td><td>O K</td></tr><tr><td>180 min Summer</td><td>1.612</td><td>1.612</td><td>2.9</td><td>13.3</td><td>O K</td></tr><tr><td>240 min Summer</td><td>1.519</td><td>1.519</td><td>2.8</td><td>12.5</td><td>O K</td></tr><tr><td>360 min Summer</td><td>1.353</td><td>1.353</td><td>2.5</td><td>11.1</td><td>O K</td></tr><tr><td>480 min Summer</td><td>1.215</td><td>1.215</td><td>2.4</td><td>10.0</td><td>O K</td></tr><tr><td>600 min Summer</td><td>1.098</td><td>1.098</td><td>2.2</td><td>9.0</td><td>O K</td></tr><tr><td>720 min Summer</td><td>0.996</td><td>0.996</td><td>2.1</td><td>8.1</td><td>O K</td></tr><tr><td>960 min Summer</td><td>0.830</td><td>0.830</td><td>1.8</td><td>6.8</td><td>O K</td></tr><tr><td>1440 min Summer</td><td>0.592</td><td>0.592</td><td>1.5</td><td>4.8</td><td>O K</td></tr><tr><td>2160 min Summer</td><td>0.368</td><td>0.368</td><td>1.2</td><td>3.0</td><td>O K</td></tr><tr><td>2880 min Summer</td><td>0.227</td><td>0.227</td><td>1.0</td><td>1.8</td><td>O K</td></tr><tr><td>4320 min Summer</td><td>0.070</td><td>0.070</td><td>0.8</td><td>0.5</td><td>O K</td></tr><tr><td>5760 min Summer</td><td>0.043</td><td>0.043</td><td>0.7</td><td>0.3</td><td>O K</td></tr><tr><td>7200 min Summer</td><td>0.036</td><td>0.036</td><td>0.6</td><td>0.2</td><td>O K</td></tr><tr><td>8640 min Summer</td><td>0.031</td><td>0.031</td><td>0.5</td><td>0.2</td><td>O K</td></tr><tr><td>10080 min Summer</td><td>0.028</td><td>0.028</td><td>0.4</td><td>0.1</td><td>O K</td></tr><tr><td>15 min Winter</td><td>1.370</td><td>1.370</td><td>2.6</td><td>11.2</td><td>O K</td></tr></table> <table><tr><th>Storm Event</th><th>Rain (mm/hr)</th><th>Flooded Volume (m³)</th><th>Time-Peak (mins)</th></tr><tr><td>15 min Summer</td><td>125.353</td><td>0.0</td><td>17</td></tr><tr><td>30 min Summer</td><td>84.267</td><td>0.0</td><td>30</td></tr><tr><td>60 min Summer</td><td>54.074</td><td>0.0</td><td>48</td></tr><tr><td>120 min Summer</td><td>33.506</td><td>0.0</td><td>82</td></tr><tr><td>180 min Summer</td><td>24.949</td><td>0.0</td><td>116</td></tr><tr><td>240 min Summer</td><td>20.093</td><td>0.0</td><td>150</td></tr><tr><td>360 min Summer</td><td>14.773</td><td>0.0</td><td>216</td></tr><tr><td>480 min Summer</td><td>11.871</td><td>0.0</td><td>282</td></tr><tr><td>600 min Summer</td><td>10.010</td><td>0.0</td><td>344</td></tr><tr><td>720 min Summer</td><td>8.703</td><td>0.0</td><td>406</td></tr><tr><td>960 min Summer</td><td>6.973</td><td>0.0</td><td>530</td></tr><tr><td>1440 min Summer</td><td>5.093</td><td>0.0</td><td>778</td></tr><tr><td>2160 min Summer</td><td>3.711</td><td>0.0</td><td>1144</td></tr><tr><td>2880 min Summer</td><td>2.961</td><td>0.0</td><td>1500</td></tr><tr><td>4320 min Summer</td><td>2.150</td><td>0.0</td><td>2204</td></tr><tr><td>5760 min Summer</td><td>1.711</td><td>0.0</td><td>2920</td></tr><tr><td>7200 min Summer</td><td>1.432</td><td>0.0</td><td>3632</td></tr><tr><td>8640 min Summer</td><td>1.240</td><td>0.0</td><td>4288</td></tr><tr><td>10080 min Summer</td><td>1.098</td><td>0.0</td><td>5080</td></tr><tr><td>15 min Winter</td><td>125.353</td><td>0.0</td><td>17</td></tr></table>						Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status	15 min Summer	1.213	1.213	2.4	9.9	O K	30 min Summer	1.488	1.488	2.7	12.2	O K	60 min Summer	1.647	1.647	2.9	13.5	O K	120 min Summer	1.682	1.682	3.0	13.8	O K	180 min Summer	1.612	1.612	2.9	13.3	O K	240 min Summer	1.519	1.519	2.8	12.5	O K	360 min Summer	1.353	1.353	2.5	11.1	O K	480 min Summer	1.215	1.215	2.4	10.0	O K	600 min Summer	1.098	1.098	2.2	9.0	O K	720 min Summer	0.996	0.996	2.1	8.1	O K	960 min Summer	0.830	0.830	1.8	6.8	O K	1440 min Summer	0.592	0.592	1.5	4.8	O K	2160 min Summer	0.368	0.368	1.2	3.0	O K	2880 min Summer	0.227	0.227	1.0	1.8	O K	4320 min Summer	0.070	0.070	0.8	0.5	O K	5760 min Summer	0.043	0.043	0.7	0.3	O K	7200 min Summer	0.036	0.036	0.6	0.2	O K	8640 min Summer	0.031	0.031	0.5	0.2	O K	10080 min Summer	0.028	0.028	0.4	0.1	O K	15 min Winter	1.370	1.370	2.6	11.2	O K	Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)	15 min Summer	125.353	0.0	17	30 min Summer	84.267	0.0	30	60 min Summer	54.074	0.0	48	120 min Summer	33.506	0.0	82	180 min Summer	24.949	0.0	116	240 min Summer	20.093	0.0	150	360 min Summer	14.773	0.0	216	480 min Summer	11.871	0.0	282	600 min Summer	10.010	0.0	344	720 min Summer	8.703	0.0	406	960 min Summer	6.973	0.0	530	1440 min Summer	5.093	0.0	778	2160 min Summer	3.711	0.0	1144	2880 min Summer	2.961	0.0	1500	4320 min Summer	2.150	0.0	2204	5760 min Summer	1.711	0.0	2920	7200 min Summer	1.432	0.0	3632	8640 min Summer	1.240	0.0	4288	10080 min Summer	1.098	0.0	5080	15 min Winter	125.353	0.0	17
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Cundall, Johnston & Partners					Page 2
19 - 21 Silvermills Court		Havant Road, Emsworth			
Henderson Place Lane		SUDs Drainage			
Edinburgh EH3 5DG		Road Trench Soakaway [TSA] 1			
Date 01/03/2017 16:50		Designed by LK/AC			
File ROAD SA 1.SRCX		Checked by AMF			
Micro Drainage		Source Control 2015.1			
<u>Summary of Results for 100 year Return Period (+40%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	1.692	1.692	3.0	13.9	O K
60 min Winter	1.879	1.879	3.0	15.5	Flood Risk
120 min Winter	1.893	1.893	3.0	15.6	Flood Risk
180 min Winter	1.767	1.767	3.0	14.5	O K
240 min Winter	1.626	1.626	2.9	13.4	O K
360 min Winter	1.382	1.382	2.6	11.4	O K
480 min Winter	1.192	1.192	2.3	9.8	O K
600 min Winter	1.037	1.037	2.1	8.5	O K
720 min Winter	0.907	0.907	2.0	7.4	O K
960 min Winter	0.703	0.703	1.7	5.7	O K
1440 min Winter	0.435	0.435	1.3	3.5	O K
2160 min Winter	0.203	0.203	1.0	1.6	O K
2880 min Winter	0.071	0.071	0.8	0.5	O K
4320 min Winter	0.039	0.039	0.6	0.2	O K
5760 min Winter	0.031	0.031	0.5	0.2	O K
7200 min Winter	0.026	0.026	0.4	0.1	O K
8640 min Winter	0.023	0.023	0.4	0.1	O K
10080 min Winter	0.022	0.022	0.3	0.1	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)		
30 min Winter	84.267	0.0	30		
60 min Winter	54.074	0.0	50		
120 min Winter	33.506	0.0	88		
180 min Winter	24.949	0.0	124		
240 min Winter	20.093	0.0	160		
360 min Winter	14.773	0.0	228		
480 min Winter	11.871	0.0	296		
600 min Winter	10.010	0.0	360		
720 min Winter	8.703	0.0	424		
960 min Winter	6.973	0.0	550		
1440 min Winter	5.093	0.0	794		
2160 min Winter	3.711	0.0	1152		
2880 min Winter	2.961	0.0	1500		
4320 min Winter	2.150	0.0	2196		
5760 min Winter	1.711	0.0	2928		
7200 min Winter	1.432	0.0	3672		
8640 min Winter	1.240	0.0	4368		
10080 min Winter	1.098	0.0	5160		
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19 - 21 Silvermills Court Henderson Place Lane Edinburgh EH3 5DG	Havant Road, Emsworth SUDs Drainage Road Trench Soakaway [TSA] 1	
Date 01/03/2017 16:50 File ROAD SA 1.SRCX	Designed by LK/AC Checked by AMF	
Micro Drainage	Source Control 2015.1	

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.100	Shortest Storm (mins)	15
Ratio R	0.350	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

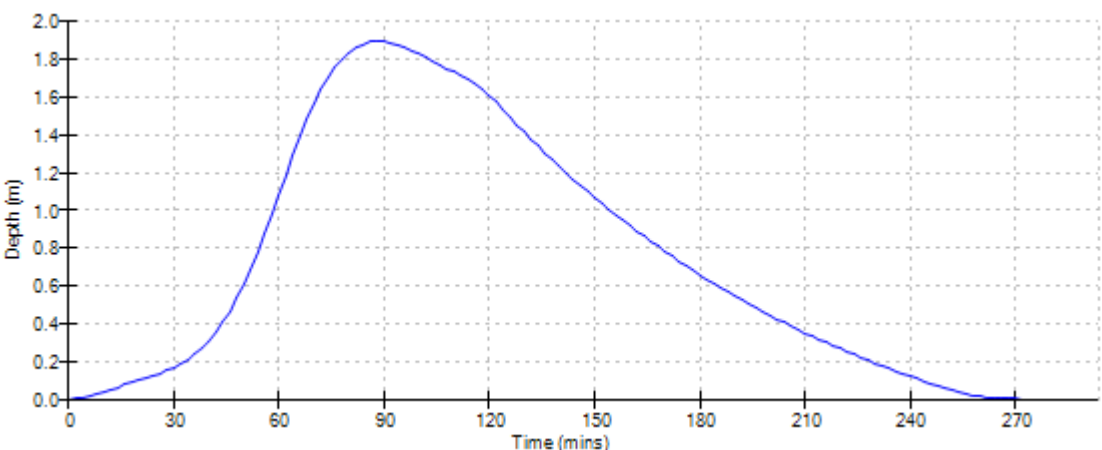
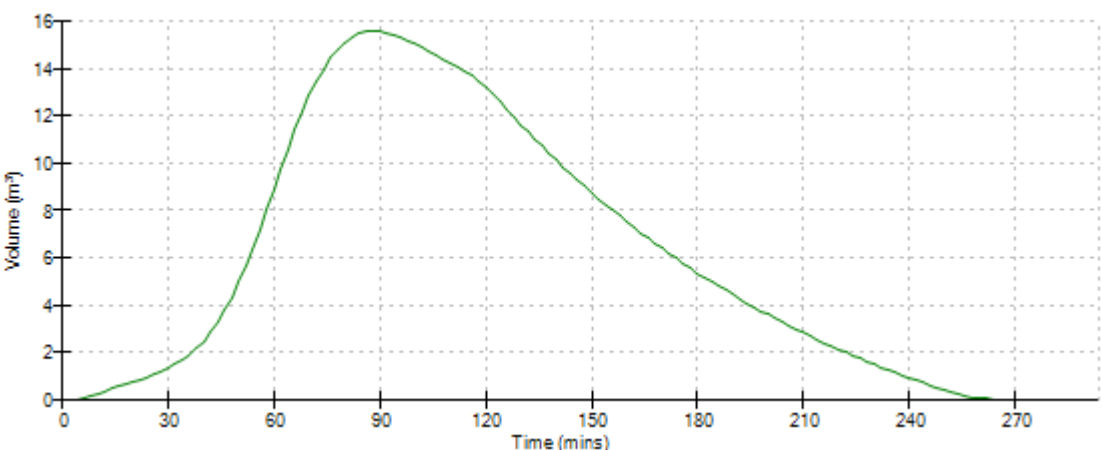
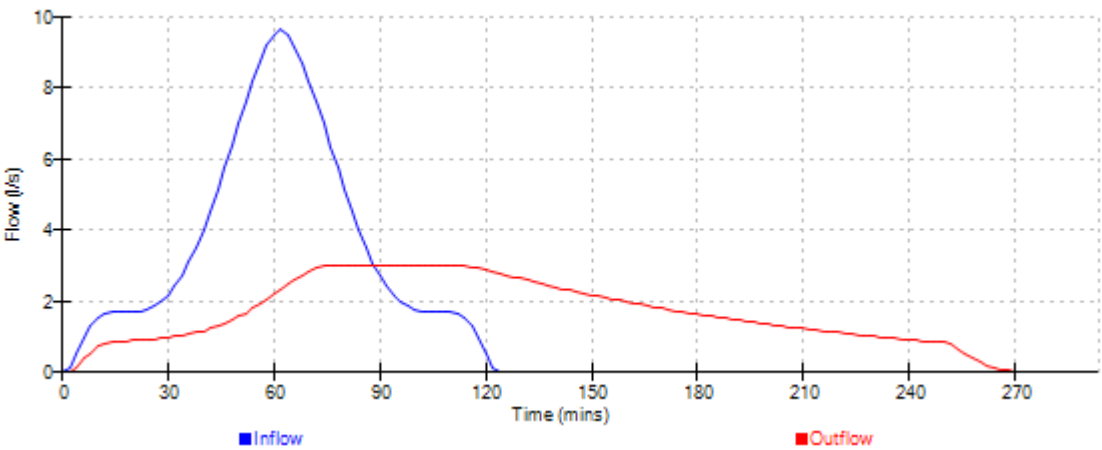
Time Area Diagram

Total Area (ha) 0.049

Time (mins) Area			Time (mins) Area		
From:	To:	(ha)	From:	To:	(ha)
0	2	0.025	2	4	0.024

Cundall, Johnston & Partners		Page 4																				
19 - 21 Silvermills Court Henderson Place Lane Edinburgh EH3 5DG	Havant Road, Emsworth SUDs Drainage Road Trench Soakaway [TSA] 1																					
Date 01/03/2017 16:50 File ROAD SA 1.SRCX	Designed by LK/AC Checked by AMF																					
Micro Drainage Source Control 2015.1																						
<u>Model Details</u> Storage is Online Cover Level (m) 2.100 <u>Trench Soakaway Structure</u> <table> <tr> <td>Infiltration Coefficient Base (m/hr)</td> <td>0.19800</td> <td>Trench Width (m)</td> <td>1.2</td> </tr> <tr> <td>Infiltration Coefficient Side (m/hr)</td> <td>0.19800</td> <td>Trench Length (m)</td> <td>23.0</td> </tr> <tr> <td>Safety Factor</td> <td>2.0</td> <td>Slope (1:X)</td> <td>1000.0</td> </tr> <tr> <td>Porosity</td> <td>0.30</td> <td>Cap Volume Depth (m)</td> <td>1.900</td> </tr> <tr> <td>Invert Level (m)</td> <td>0.000</td> <td>Cap Infiltration Depth (m)</td> <td>1.700</td> </tr> </table>			Infiltration Coefficient Base (m/hr)	0.19800	Trench Width (m)	1.2	Infiltration Coefficient Side (m/hr)	0.19800	Trench Length (m)	23.0	Safety Factor	2.0	Slope (1:X)	1000.0	Porosity	0.30	Cap Volume Depth (m)	1.900	Invert Level (m)	0.000	Cap Infiltration Depth (m)	1.700
Infiltration Coefficient Base (m/hr)	0.19800	Trench Width (m)	1.2																			
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Event: 120 min Winter



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19 - 21 Silvermills Court Henderson Place Lane Edinburgh EH3 5DG		Havant Road, Emsworth SUDs Drainage Road Trench Soakaway [TSA] 2																																																																																																																																																																																																																					
Date 01/03/2017 16:57 File ROAD SA 2.SRCX		Designed by LK/AC Checked by AMF																																																																																																																																																																																																																					
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<u>Summary of Results for 100 year Return Period (+40%)</u> Half Drain Time : 45 minutes. <table><tr><th>Storm Event</th><th>Max Level (m)</th><th>Max Depth (m)</th><th>Max Infiltration (l/s)</th><th>Max Volume (m³)</th><th>Status</th></tr><tr><td>15 min Summer</td><td>1.241</td><td>1.241</td><td>1.2</td><td>3.7</td><td>O K</td></tr><tr><td>30 min Summer</td><td>1.485</td><td>1.485</td><td>1.4</td><td>4.4</td><td>O K</td></tr><tr><td>60 min Summer</td><td>1.623</td><td>1.623</td><td>1.5</td><td>4.9</td><td>O K</td></tr><tr><td>120 min Summer</td><td>1.606</td><td>1.606</td><td>1.5</td><td>4.8</td><td>O K</td></tr><tr><td>180 min Summer</td><td>1.502</td><td>1.502</td><td>1.4</td><td>4.5</td><td>O K</td></tr><tr><td>240 min Summer</td><td>1.390</td><td>1.390</td><td>1.3</td><td>4.2</td><td>O K</td></tr><tr><td>360 min Summer</td><td>1.202</td><td>1.202</td><td>1.2</td><td>3.6</td><td>O K</td></tr><tr><td>480 min Summer</td><td>1.054</td><td>1.054</td><td>1.1</td><td>3.1</td><td>O K</td></tr><tr><td>600 min Summer</td><td>0.933</td><td>0.933</td><td>1.0</td><td>2.8</td><td>O K</td></tr><tr><td>720 min Summer</td><td>0.832</td><td>0.832</td><td>0.9</td><td>2.5</td><td>O K</td></tr><tr><td>960 min Summer</td><td>0.672</td><td>0.672</td><td>0.8</td><td>2.0</td><td>O K</td></tr><tr><td>1440 min Summer</td><td>0.456</td><td>0.456</td><td>0.6</td><td>1.4</td><td>O K</td></tr><tr><td>2160 min Summer</td><td>0.263</td><td>0.263</td><td>0.5</td><td>0.8</td><td>O K</td></tr><tr><td>2880 min Summer</td><td>0.146</td><td>0.146</td><td>0.4</td><td>0.4</td><td>O K</td></tr><tr><td>4320 min Summer</td><td>0.047</td><td>0.047</td><td>0.3</td><td>0.1</td><td>O K</td></tr><tr><td>5760 min Summer</td><td>0.038</td><td>0.038</td><td>0.3</td><td>0.1</td><td>O K</td></tr><tr><td>7200 min Summer</td><td>0.032</td><td>0.032</td><td>0.2</td><td>0.1</td><td>O K</td></tr><tr><td>8640 min Summer</td><td>0.027</td><td>0.027</td><td>0.2</td><td>0.1</td><td>O K</td></tr><tr><td>10080 min Summer</td><td>0.024</td><td>0.024</td><td>0.2</td><td>0.1</td><td>O K</td></tr><tr><td>15 min Winter</td><td>1.403</td><td>1.403</td><td>1.3</td><td>4.2</td><td>O K</td></tr></table> <table><tr><th>Storm Event</th><th>Rain (mm/hr)</th><th>Flooded Volume (m³)</th><th>Time-Peak (mins)</th></tr><tr><td>15 min Summer</td><td>125.353</td><td>0.0</td><td>16</td></tr><tr><td>30 min Summer</td><td>84.267</td><td>0.0</td><td>27</td></tr><tr><td>60 min Summer</td><td>54.074</td><td>0.0</td><td>44</td></tr><tr><td>120 min Summer</td><td>33.506</td><td>0.0</td><td>78</td></tr><tr><td>180 min Summer</td><td>24.949</td><td>0.0</td><td>112</td></tr><tr><td>240 min Summer</td><td>20.093</td><td>0.0</td><td>146</td></tr><tr><td>360 min Summer</td><td>14.773</td><td>0.0</td><td>210</td></tr><tr><td>480 min Summer</td><td>11.871</td><td>0.0</td><td>274</td></tr><tr><td>600 min Summer</td><td>10.010</td><td>0.0</td><td>336</td></tr><tr><td>720 min Summer</td><td>8.703</td><td>0.0</td><td>398</td></tr><tr><td>960 min Summer</td><td>6.973</td><td>0.0</td><td>520</td></tr><tr><td>1440 min Summer</td><td>5.093</td><td>0.0</td><td>764</td></tr><tr><td>2160 min Summer</td><td>3.711</td><td>0.0</td><td>1124</td></tr><tr><td>2880 min Summer</td><td>2.961</td><td>0.0</td><td>1472</td></tr><tr><td>4320 min Summer</td><td>2.150</td><td>0.0</td><td>2144</td></tr><tr><td>5760 min Summer</td><td>1.711</td><td>0.0</td><td>2928</td></tr><tr><td>7200 min Summer</td><td>1.432</td><td>0.0</td><td>3624</td></tr><tr><td>8640 min Summer</td><td>1.240</td><td>0.0</td><td>4272</td></tr><tr><td>10080 min Summer</td><td>1.098</td><td>0.0</td><td>5080</td></tr><tr><td>15 min Winter</td><td>125.353</td><td>0.0</td><td>16</td></tr></table>						Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status	15 min Summer	1.241	1.241	1.2	3.7	O K	30 min Summer	1.485	1.485	1.4	4.4	O K	60 min Summer	1.623	1.623	1.5	4.9	O K	120 min Summer	1.606	1.606	1.5	4.8	O K	180 min Summer	1.502	1.502	1.4	4.5	O K	240 min Summer	1.390	1.390	1.3	4.2	O K	360 min Summer	1.202	1.202	1.2	3.6	O K	480 min Summer	1.054	1.054	1.1	3.1	O K	600 min Summer	0.933	0.933	1.0	2.8	O K	720 min Summer	0.832	0.832	0.9	2.5	O K	960 min Summer	0.672	0.672	0.8	2.0	O K	1440 min Summer	0.456	0.456	0.6	1.4	O K	2160 min Summer	0.263	0.263	0.5	0.8	O K	2880 min Summer	0.146	0.146	0.4	0.4	O K	4320 min Summer	0.047	0.047	0.3	0.1	O K	5760 min Summer	0.038	0.038	0.3	0.1	O K	7200 min Summer	0.032	0.032	0.2	0.1	O K	8640 min Summer	0.027	0.027	0.2	0.1	O K	10080 min Summer	0.024	0.024	0.2	0.1	O K	15 min Winter	1.403	1.403	1.3	4.2	O K	Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)	15 min Summer	125.353	0.0	16	30 min Summer	84.267	0.0	27	60 min Summer	54.074	0.0	44	120 min Summer	33.506	0.0	78	180 min Summer	24.949	0.0	112	240 min Summer	20.093	0.0	146	360 min Summer	14.773	0.0	210	480 min Summer	11.871	0.0	274	600 min Summer	10.010	0.0	336	720 min Summer	8.703	0.0	398	960 min Summer	6.973	0.0	520	1440 min Summer	5.093	0.0	764	2160 min Summer	3.711	0.0	1124	2880 min Summer	2.961	0.0	1472	4320 min Summer	2.150	0.0	2144	5760 min Summer	1.711	0.0	2928	7200 min Summer	1.432	0.0	3624	8640 min Summer	1.240	0.0	4272	10080 min Summer	1.098	0.0	5080	15 min Winter	125.353	0.0	16
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19 - 21 Silvermills Court Henderson Place Lane Edinburgh EH3 5DG		Havant Road, Emsworth SUDs Drainage Road Trench Soakaway [TSA] 2			
Date 01/03/2017 16:57 File ROAD SA 2.SRCX		Designed by LK/AC Checked by AMF			
Micro Drainage		Source Control 2015.1			
<u>Summary of Results for 100 year Return Period (+40%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	1.689	1.689	1.5	5.1	O K
60 min Winter	1.833	1.833	1.5	5.5	Flood Risk
120 min Winter	1.759	1.759	1.5	5.3	O K
180 min Winter	1.592	1.592	1.5	4.8	O K
240 min Winter	1.429	1.429	1.3	4.3	O K
360 min Winter	1.170	1.170	1.2	3.5	O K
480 min Winter	0.977	0.977	1.0	2.9	O K
600 min Winter	0.827	0.827	0.9	2.5	O K
720 min Winter	0.706	0.706	0.8	2.1	O K
960 min Winter	0.525	0.525	0.7	1.6	O K
1440 min Winter	0.299	0.299	0.5	0.9	O K
2160 min Winter	0.115	0.115	0.4	0.3	O K
2880 min Winter	0.047	0.047	0.3	0.1	O K
4320 min Winter	0.034	0.034	0.2	0.1	O K
5760 min Winter	0.027	0.027	0.2	0.1	O K
7200 min Winter	0.023	0.023	0.2	0.1	O K
8640 min Winter	0.020	0.020	0.1	0.0	O K
10080 min Winter	0.018	0.018	0.1	0.0	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)		
30 min Winter	84.267	0.0	29		
60 min Winter	54.074	0.0	46		
120 min Winter	33.506	0.0	84		
180 min Winter	24.949	0.0	120		
240 min Winter	20.093	0.0	154		
360 min Winter	14.773	0.0	220		
480 min Winter	11.871	0.0	284		
600 min Winter	10.010	0.0	348		
720 min Winter	8.703	0.0	410		
960 min Winter	6.973	0.0	532		
1440 min Winter	5.093	0.0	778		
2160 min Winter	3.711	0.0	1128		
2880 min Winter	2.961	0.0	1436		
4320 min Winter	2.150	0.0	2148		
5760 min Winter	1.711	0.0	2864		
7200 min Winter	1.432	0.0	3736		
8640 min Winter	1.240	0.0	4400		
10080 min Winter	1.098	0.0	4968		
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19 - 21 Silvermills Court Henderson Place Lane Edinburgh EH3 5DG	Havant Road, Emsworth SUDs Drainage Road Trench Soakaway [TSA] 2	
Date 01/03/2017 16:57 File ROAD SA 2.SRCX	Designed by LK/AC Checked by AMF	
Micro Drainage	Source Control 2015.1	

Rainfall Details

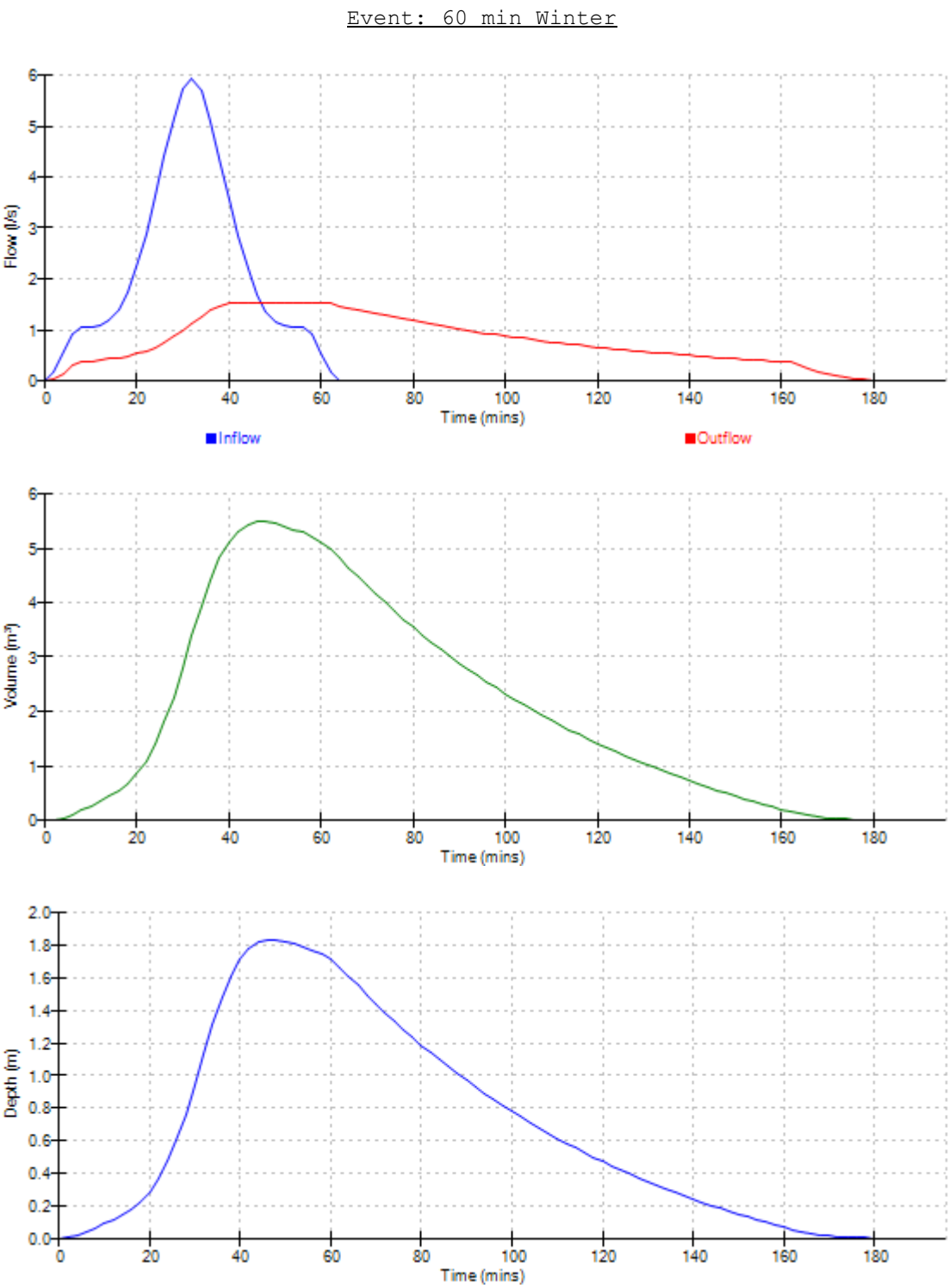
Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.100	Shortest Storm (mins)	15
Ratio R	0.350	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.019

Time (mins) Area			Time (mins) Area		
From:	To:	(ha)	From:	To:	(ha)
0	2	0.010	2	4	0.009

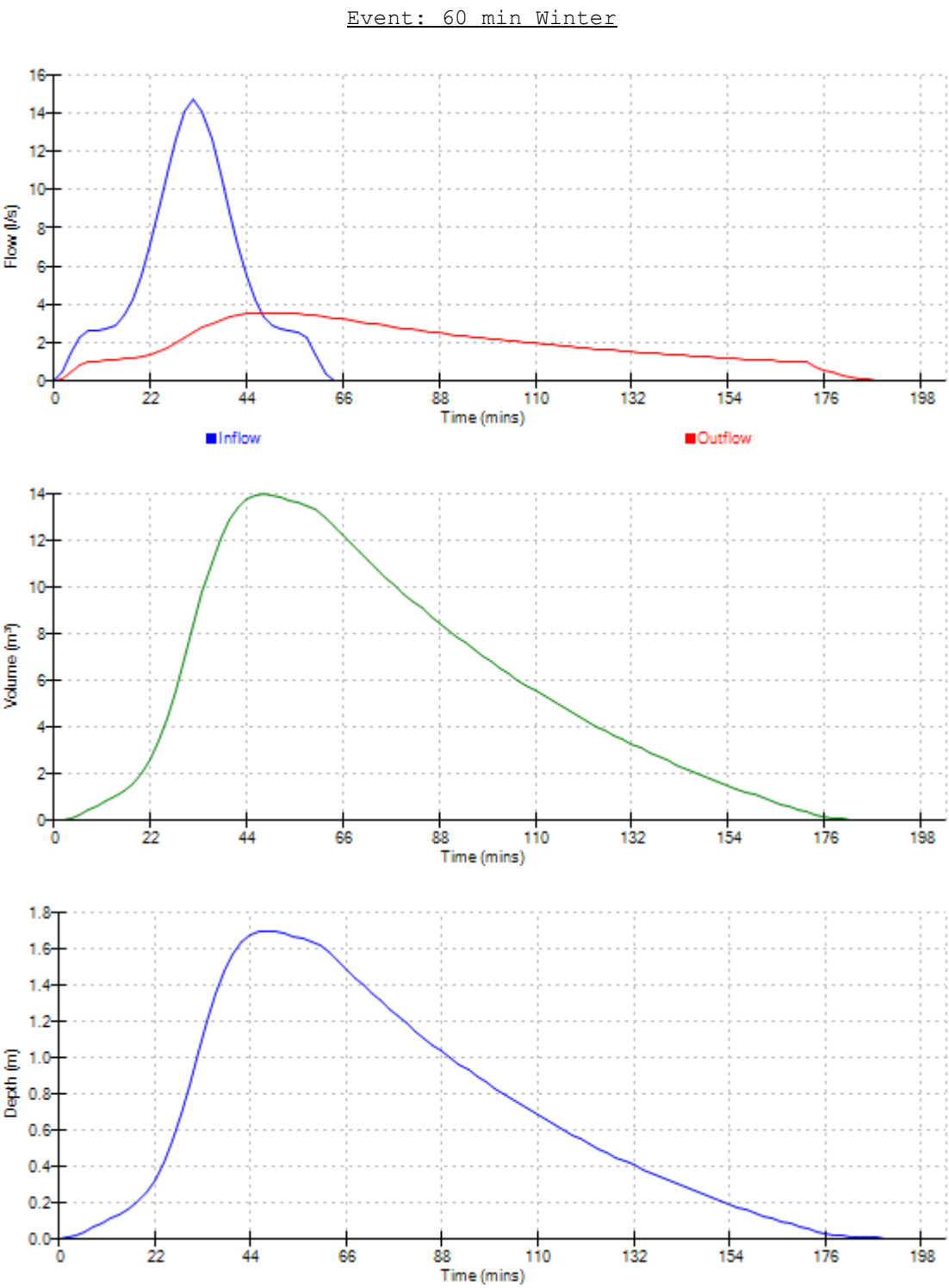
Cundall, Johnston & Partners		Page 4																				
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<u>Model Details</u> Storage is Online Cover Level (m) 2.100 <u>Trench Soakaway Structure</u> <table> <tr> <td>Infiltration Coefficient Base (m/hr)</td> <td>0.23400</td> <td>Trench Width (m)</td> <td>1.0</td> </tr> <tr> <td>Infiltration Coefficient Side (m/hr)</td> <td>0.23400</td> <td>Trench Length (m)</td> <td>10.0</td> </tr> <tr> <td>Safety Factor</td> <td>2.0</td> <td>Slope (1:X)</td> <td>1000.0</td> </tr> <tr> <td>Porosity</td> <td>0.30</td> <td>Cap Volume Depth (m)</td> <td>1.900</td> </tr> <tr> <td>Invert Level (m)</td> <td>0.000</td> <td>Cap Infiltration Depth (m)</td> <td>1.700</td> </tr> </table>			Infiltration Coefficient Base (m/hr)	0.23400	Trench Width (m)	1.0	Infiltration Coefficient Side (m/hr)	0.23400	Trench Length (m)	10.0	Safety Factor	2.0	Slope (1:X)	1000.0	Porosity	0.30	Cap Volume Depth (m)	1.900	Invert Level (m)	0.000	Cap Infiltration Depth (m)	1.700
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<u>Summary of Results for 100 year Return Period (+40%)</u> Half Drain Time : 41 minutes. <table><thead><tr><th>Storm Event</th><th>Max Level (m)</th><th>Max Depth (m)</th><th>Max Infiltration (l/s)</th><th>Max Volume (m³)</th><th>Status</th></tr></thead><tbody><tr><td>15 min Summer</td><td>1.132</td><td>1.132</td><td>2.7</td><td>9.3</td><td>O K</td></tr><tr><td>30 min Summer</td><td>1.368</td><td>1.368</td><td>3.0</td><td>11.2</td><td>O K</td></tr><tr><td>60 min Summer</td><td>1.498</td><td>1.498</td><td>3.2</td><td>12.3</td><td>O K</td></tr><tr><td>120 min Summer</td><td>1.495</td><td>1.495</td><td>3.2</td><td>12.3</td><td>O K</td></tr><tr><td>180 min Summer</td><td>1.409</td><td>1.409</td><td>3.1</td><td>11.6</td><td>O K</td></tr><tr><td>240 min Summer</td><td>1.312</td><td>1.312</td><td>2.9</td><td>10.8</td><td>O K</td></tr><tr><td>360 min Summer</td><td>1.145</td><td>1.145</td><td>2.7</td><td>9.4</td><td>O K</td></tr><tr><td>480 min Summer</td><td>1.008</td><td>1.008</td><td>2.5</td><td>8.3</td><td>O K</td></tr><tr><td>600 min Summer</td><td>0.894</td><td>0.894</td><td>2.3</td><td>7.3</td><td>O K</td></tr><tr><td>720 min Summer</td><td>0.797</td><td>0.797</td><td>2.1</td><td>6.5</td><td>O K</td></tr><tr><td>960 min Summer</td><td>0.640</td><td>0.640</td><td>1.9</td><td>5.2</td><td>O K</td></tr><tr><td>1440 min Summer</td><td>0.425</td><td>0.425</td><td>1.5</td><td>3.4</td><td>O K</td></tr><tr><td>2160 min Summer</td><td>0.228</td><td>0.228</td><td>1.2</td><td>1.8</td><td>O K</td></tr><tr><td>2880 min Summer</td><td>0.112</td><td>0.112</td><td>1.1</td><td>0.8</td><td>O K</td></tr><tr><td>4320 min Summer</td><td>0.043</td><td>0.043</td><td>0.8</td><td>0.3</td><td>O K</td></tr><tr><td>5760 min Summer</td><td>0.035</td><td>0.035</td><td>0.7</td><td>0.2</td><td>O K</td></tr><tr><td>7200 min Summer</td><td>0.029</td><td>0.029</td><td>0.6</td><td>0.1</td><td>O K</td></tr><tr><td>8640 min Summer</td><td>0.026</td><td>0.026</td><td>0.5</td><td>0.1</td><td>O K</td></tr><tr><td>10080 min Summer</td><td>0.023</td><td>0.023</td><td>0.4</td><td>0.1</td><td>O K</td></tr><tr><td>15 min Winter</td><td>1.281</td><td>1.281</td><td>2.9</td><td>10.5</td><td>O K</td></tr></tbody></table> <table><thead><tr><th>Storm Event</th><th>Rain (mm/hr)</th><th>Flooded Volume (m³)</th><th>Time-Peak (mins)</th></tr></thead><tbody><tr><td>15 min Summer</td><td>125.353</td><td>0.0</td><td>17</td></tr><tr><td>30 min Summer</td><td>84.267</td><td>0.0</td><td>29</td></tr><tr><td>60 min Summer</td><td>54.074</td><td>0.0</td><td>46</td></tr><tr><td>120 min Summer</td><td>33.506</td><td>0.0</td><td>80</td></tr><tr><td>180 min Summer</td><td>24.949</td><td>0.0</td><td>114</td></tr><tr><td>240 min Summer</td><td>20.093</td><td>0.0</td><td>148</td></tr><tr><td>360 min Summer</td><td>14.773</td><td>0.0</td><td>214</td></tr><tr><td>480 min Summer</td><td>11.871</td><td>0.0</td><td>276</td></tr><tr><td>600 min Summer</td><td>10.010</td><td>0.0</td><td>340</td></tr><tr><td>720 min Summer</td><td>8.703</td><td>0.0</td><td>400</td></tr><tr><td>960 min Summer</td><td>6.973</td><td>0.0</td><td>522</td></tr><tr><td>1440 min Summer</td><td>5.093</td><td>0.0</td><td>766</td></tr><tr><td>2160 min Summer</td><td>3.711</td><td>0.0</td><td>1124</td></tr><tr><td>2880 min Summer</td><td>2.961</td><td>0.0</td><td>1472</td></tr><tr><td>4320 min Summer</td><td>2.150</td><td>0.0</td><td>2196</td></tr><tr><td>5760 min Summer</td><td>1.711</td><td>0.0</td><td>2856</td></tr><tr><td>7200 min Summer</td><td>1.432</td><td>0.0</td><td>3568</td></tr><tr><td>8640 min Summer</td><td>1.240</td><td>0.0</td><td>4392</td></tr><tr><td>10080 min Summer</td><td>1.098</td><td>0.0</td><td>4960</td></tr><tr><td>15 min Winter</td><td>125.353</td><td>0.0</td><td>17</td></tr></tbody></table>						Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status	15 min Summer	1.132	1.132	2.7	9.3	O K	30 min Summer	1.368	1.368	3.0	11.2	O K	60 min Summer	1.498	1.498	3.2	12.3	O K	120 min Summer	1.495	1.495	3.2	12.3	O K	180 min Summer	1.409	1.409	3.1	11.6	O K	240 min Summer	1.312	1.312	2.9	10.8	O K	360 min Summer	1.145	1.145	2.7	9.4	O K	480 min Summer	1.008	1.008	2.5	8.3	O K	600 min Summer	0.894	0.894	2.3	7.3	O K	720 min Summer	0.797	0.797	2.1	6.5	O K	960 min Summer	0.640	0.640	1.9	5.2	O K	1440 min Summer	0.425	0.425	1.5	3.4	O K	2160 min Summer	0.228	0.228	1.2	1.8	O K	2880 min Summer	0.112	0.112	1.1	0.8	O K	4320 min Summer	0.043	0.043	0.8	0.3	O K	5760 min Summer	0.035	0.035	0.7	0.2	O K	7200 min Summer	0.029	0.029	0.6	0.1	O K	8640 min Summer	0.026	0.026	0.5	0.1	O K	10080 min Summer	0.023	0.023	0.4	0.1	O K	15 min Winter	1.281	1.281	2.9	10.5	O K	Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)	15 min Summer	125.353	0.0	17	30 min Summer	84.267	0.0	29	60 min Summer	54.074	0.0	46	120 min Summer	33.506	0.0	80	180 min Summer	24.949	0.0	114	240 min Summer	20.093	0.0	148	360 min Summer	14.773	0.0	214	480 min Summer	11.871	0.0	276	600 min Summer	10.010	0.0	340	720 min Summer	8.703	0.0	400	960 min Summer	6.973	0.0	522	1440 min Summer	5.093	0.0	766	2160 min Summer	3.711	0.0	1124	2880 min Summer	2.961	0.0	1472	4320 min Summer	2.150	0.0	2196	5760 min Summer	1.711	0.0	2856	7200 min Summer	1.432	0.0	3568	8640 min Summer	1.240	0.0	4392	10080 min Summer	1.098	0.0	4960	15 min Winter	125.353	0.0	17
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Cundall, Johnston & Partners				Page 2	
19 - 21 Silvermills Court		Havant Road, Emsworth			
Henderson Place Lane		SUDS Drainage			
Edinburgh EH3 5DG		Road Trench Soakaway [TSA] 1			
Date 01/03/2017 16:55		Designed by LK/AC			
File ROAD SA 3.SRCX		Checked by AMF			
Micro Drainage		Source Control 2015.1			
<u>Summary of Results for 100 year Return Period (+40%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	1.559	1.559	3.3	12.8	O K
60 min Winter	1.698	1.698	3.6	14.0	O K
120 min Winter	1.659	1.659	3.5	13.6	O K
180 min Winter	1.522	1.522	3.3	12.5	O K
240 min Winter	1.376	1.376	3.0	11.3	O K
360 min Winter	1.140	1.140	2.7	9.3	O K
480 min Winter	0.956	0.956	2.4	7.8	O K
600 min Winter	0.809	0.809	2.2	6.6	O K
720 min Winter	0.689	0.689	2.0	5.6	O K
960 min Winter	0.505	0.505	1.7	4.1	O K
1440 min Winter	0.270	0.270	1.3	2.1	O K
2160 min Winter	0.078	0.078	1.0	0.6	O K
2880 min Winter	0.043	0.043	0.8	0.3	O K
4320 min Winter	0.032	0.032	0.6	0.2	O K
5760 min Winter	0.025	0.025	0.5	0.1	O K
7200 min Winter	0.022	0.022	0.4	0.1	O K
8640 min Winter	0.021	0.021	0.4	0.1	O K
10080 min Winter	0.020	0.020	0.3	0.1	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)		
30 min Winter	84.267	0.0	30		
60 min Winter	54.074	0.0	48		
120 min Winter	33.506	0.0	86		
180 min Winter	24.949	0.0	122		
240 min Winter	20.093	0.0	156		
360 min Winter	14.773	0.0	224		
480 min Winter	11.871	0.0	290		
600 min Winter	10.010	0.0	354		
720 min Winter	8.703	0.0	418		
960 min Winter	6.973	0.0	540		
1440 min Winter	5.093	0.0	780		
2160 min Winter	3.711	0.0	1128		
2880 min Winter	2.961	0.0	1468		
4320 min Winter	2.150	0.0	2132		
5760 min Winter	1.711	0.0	2816		
7200 min Winter	1.432	0.0	3672		
8640 min Winter	1.240	0.0	4400		
10080 min Winter	1.098	0.0	4968		
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Cundall, Johnston & Partners		Page 4																				
19 - 21 Silvermills Court Henderson Place Lane Edinburgh EH3 5DG	Havant Road, Emsworth SUDS Drainage Road Trench Soakaway [TSA] 1																					
Date 01/03/2017 16:55 File ROAD SA 3.SRCX	Designed by LK/AC Checked by AMF																					
Micro Drainage Source Control 2015.1																						
<u>Model Details</u> Storage is Online Cover Level (m) 2.100 <u>Trench Soakaway Structure</u> <table> <tr> <td>Infiltration Coefficient Base (m/hr)</td> <td>0.23400</td> <td>Trench Width (m)</td> <td>1.2</td> </tr> <tr> <td>Infiltration Coefficient Side (m/hr)</td> <td>0.23400</td> <td>Trench Length (m)</td> <td>23.0</td> </tr> <tr> <td>Safety Factor</td> <td>2.0</td> <td>Slope (1:X)</td> <td>1000.0</td> </tr> <tr> <td>Porosity</td> <td>0.30</td> <td>Cap Volume Depth (m)</td> <td>1.900</td> </tr> <tr> <td>Invert Level (m)</td> <td>0.000</td> <td>Cap Infiltration Depth (m)</td> <td>1.700</td> </tr> </table>			Infiltration Coefficient Base (m/hr)	0.23400	Trench Width (m)	1.2	Infiltration Coefficient Side (m/hr)	0.23400	Trench Length (m)	23.0	Safety Factor	2.0	Slope (1:X)	1000.0	Porosity	0.30	Cap Volume Depth (m)	1.900	Invert Level (m)	0.000	Cap Infiltration Depth (m)	1.700
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Porosity	0.30	Cap Volume Depth (m)	1.900																			
Invert Level (m)	0.000	Cap Infiltration Depth (m)	1.700																			
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Appendix 8 – Drainage Strategy Plans

- CLXX(52)2001 Drainage Strategy Plan Sheet 1 of 2
- CLXX(52)2002 Drainage Strategy Plan Sheet 2 of 2

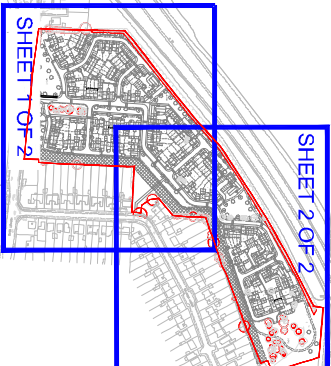
Based on:	Revised by:	Rev
Drawn by:	Checked by:	Rev
Reviewed by:	Approved by:	Rev
Other Eng. No.:	Other Eng. No.:	Rev

DO NOT SCALE FROM THIS DRAWING

Notes

KEY

- IMPERMEABLE CONSTRUCTION
- ROAD - DRAINING TO SWALE
- PERMEABLE CONSTRUCTION
- ROAD, CAR PARKING & DRIVEWAYS
- SERVICE CORRIDOR (2M WIDE)
- FOLL WATER DRAIN
- PLOT FOLL FLOW DIRECTION
- SURFACE WATER DRAIN
- SURFACE WATER DISTRIBUTION BOX
- ROOF AREA RUNOFF DIRECTION TO DISCHARGE POINT
- PRIVATE SOAKAWAY TRENCH (TSA1 - TSA9)
- SWALE
- SITE ZONES (A-C)
- ROOT PROTECTION ZONES
- WILSON BAILEY TRIAL PITS



P2	01/02/2017	REVISED TO SUIT	SJ	AMF	AMF
P1	21/07/2016	ISSUED FOR PLANNING	SJ	AMF	AMF
-	14/07/2016	ISSUED FOR COMMENT	SJ	AMF	AMF
Issue	Date	Description	By	Chk	Verd

Project
LAND AT HAVANT ROAD,
EMSWORTH

Client
BDW SOUTHAMPTON
Architect
SIMON COOPER ASSOCIATES

Title
DRAINAGE LAYOUT
SHEET 2 OF 2

Drawing No.	CLXX(52)/2002	Drawing Status	PLANNING
Job No.	1012052	Scale	1:500 @A1
Originator	LKAC	Checked	AMF
		Verified	AMF
		Issued	P2

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