Aldershot Autos Main Works Area Attenuation

Limit on Discharge (Greenfield Run-Off rate) [redacted] **(Default is 2 litres per second)**
Area (Hectares) [redacted] **hectares**
Total Outflow **1.2 litres per second**
Total Area [redacted] **square metres**

Based on Statutory Planning Guidance
Storage Requirement for Increased Paving Area.

10 year return period

Storm	Storm duration	Rainfall	Rainwater Collected	Max. Attenuated Outflow	Rainwater Collected	Max. Attenuated Outflow	**Storage required**	**Additional 25% Volume for Climate Change**
	mins.	mm.	cum.	cum.	cum.	cum.	**cum.**	**cum.**
M2-10	2	3.4	20	0	20	0	20	25
M5-10	5	6.2	37	0	37	0	37	46
M10-10	**10**	**8.9**	53	1	**53**	**1**	**52**	65
M15-10	15	11.3	68	1	68	1	67	84
M30-10	30	14.9	89	2	89	2	87	109
M60-10	60	19.1	115	4	115	4	111	139
M120-10	120	24	144	9	144	9	**135**	169
M240-10	240	31	186	17	186	17	169	211
M360-10								
M720-10	720	45	270	52	270	52	218	273
M1day-10	1440	55	330	104	330	104	226	283
M2day-10	2880	66	396	207	396	207	189	236

20 year return period

Storm	Storm duration	Rainfall	Rainwater Collected	Max. Attenuated Outflow	Rainwater Collected	Max. Attenuated Outflow	**Storage required**	**Additional 25% Volume for Climate Change**
	mins.	mm.	cum.	cum.	cum.	cum.	**cum.**	**cum.**
M2-20	2	4.2	25	0	25	0	25	31
M5-20	5	7.5	45	0	45	0	45	56
M10-20	**10**	**11.0**	66	1	**66**	**1**	**65**	81
M15-20	15	14.0	84	1	84	1	83	104
M30-20	30	18.3	110	2	110	2	**108**	135
M60-20	60	23.0	138	4	138	4	134	168
M120-20	120	29.0	174	9	174	9	165	206
M240-20	240	36.0	216	17	216	17	199	249
M360-20								
M720-20	720	53.0	318	52	318	52	266	333
M1day-20	1440	63.0	378	104	378	104	274	343
M2day-20	2880	76.0	456	207	456	207	249	311

1 in 100 year critical
6 hour event
Inc. Climate Change.

50 year return period

Storm	Storm duration	Rainfall	Rainwater Collected	Max. Attenuated Outflow	Rainwater Collected	Max. Attenuated Outflow	**Storage required**	**Additional 25% Volume for Climate Change**
	mins.	mm.	cum.	cum.	cum.	cum.	**cum.**	**cum.**
M2-50	2	5.3	32	0	32	0	32	40
M5-50	5	9.7	58	0	58	0	58	73
M10-50	**10**	**14.2**	85	1	**85**	**1**	**84**	105
M15-50	15	18.2	109	1	109	1	108	135
M30-50	30	24.0	144	2	144	2	142	178
M60-50	60	30.0	180	4	180	4	**176**	220
M120-50	120	36.0	216	9	216	9	207	259
M240-50	240	44.0	264	17	264	17	247	309
M360-50								
M720-50	720	64.0	384	52	384	52	332	415
M1day-50	1440	76.0	456	104	456	104	352	440
M2day-50	2880	91.0	546	207	546	207	339	424

$410m^3$ < Storage provided.

100 year return period

Storm	Storm duration	Rainfall	Rainwater Collected	Max. Attenuated Outflow	Rainwater Collected	Max. Attenuated Outflow	**Storage required**	**Additional 25% Volume for Climate Change**
	mins.	mm.	cum.	cum.	cum.	cum.	**cum.**	**cum.**
M2-100	2	6.0	36	0	36	0	36	45
M5-100	5	11.0	66	0	66	0	66	83
M10-100	10	16.4	98	1	98	1	97	121
M15-100	**15**	**21.0**	126	1	**126**	**1**	**125**	156
M30-100	30	29.0	168	3	168	3	166	208
M60-100	60	35.0	210	4	210	4	**206**	258
M120-100	120	42.0	252	9	252	9	243	304
M240-100	240	51.0	306	17	306	17	289	361
M720-100	720	72.0	432	52	432	52	380	475
M1day-100	1440	87.0	522	104	522	104	418	523
M2day-100	2880	103.0	618	207	618	207	411	514

Surface Water Storage Requirements for Sites

Site name: aldershot autos
Site location: former works site
Site coordinates
Latitude: 51.27234 deg N
Longitude: 0.73259 deg W

Reference: 1350050557684
Date: 12/10/2012

This is an estimation of the storage volume requirements that are needed to meet normal best practice criteria in line with Environment Agency guidance "Preliminary rainfall runoff management for developments" (2005), W5-074/A/TR1/1 rev. D and the CIRIA SUDS Manual (2007). It is not to be used for detailed design of drainage systems. It is recommended that detailed design of any drainage scheme uses hydraulic modelling software to finalise storage requirements before construction takes place.

- **Site Characteristics:**

Total site area	2.4	ha
Significant public open space	0	ha
Area positively drained	2.4	ha
Impermeable area	2.1	ha
Percentage of drained area that is impermeable	88	%
Impervious area drained via infiltration	0	ha
Return period for infiltration system design	10	year
Impervious area drained to rainwater harvesting systems	2.1	ha
Return period for rainwater harvesting system design	100	year
Compliance factor for rainwater harvesting system design	70	%
Net site area for storage volume design	0.93	ha

- **Methodology:**

Greenfield runoff method	IH 124
Volume control approach	Long Term Storage

Hydrological Characteristics:	**Automatic values**	**Editable values**	
HOST	9	9	
SPRHOST	0.253	0.253	%
SAAR	704	704	mm
M5-60 Rainfall Depth	20	20	mm
'r' Ratio M5-60/M5-2 day	0.4	0.4	
FEH/FSR conversion factor	0.84	0.84	
Hydrological region	6	6	
Growth curve factor: 1 year	0.85	0.85	
Growth curve factor: 30 year	2.3	2.3	
Growth curve factor: 100 year	3.19	3.19	

- **Design Criteria:**

Climate change allowance factor	1.3	1.3	
Urban creep allowance factor	1.1	1.1	
Interception rainfall depth	5	5	mm

- **Greenfield Runoff Rates:**

Qbar	**3.04**	**3.04**	l/s

1 in 1 year	**5**	**5**	l/s
1 in 30 years	**7**	**7**	l/s
1 in 100 years	**9.7**	**9.7**	l/s

- **Estimated Storage Volumes:**

Interception storage	**83.27**	**83.27**	m^3
Attenuation storage	**0**	**0**	m^3
Long term storage	**674.94**	**674.94**	m^3
Treatment storage	**97.65**	**97.65**	m^3
Total storage	**758.2**	**758.2**	m^3

Please note that a minimum flow of 5 l/s applies to any site

HR Wallingford Ltd, the Environment Agency and any local authority are not liable for the performance of a drainage scheme which is based upon the output of this report.