

		DRAINAGE CALCULATION						
KANE DESIGN		30 year and 100 year STORAGE			DRAFT			
Civil Engineering Design Services 15 Winchester Way, Gresford Wrexham LL12 8HH Tel: 01 9788 855888		Project BETTISFIELD WHITCHURCH SY 13 2LN			Scheme number 1549 DATE 24-Dec-21 BY AK Sheet 1 of 2 checked			
NOTES								
Calculation Description		Proposed (post-development) PROPOSED STORAGE						
SURFACE WATER DESIGN:		MODIFIED RATIONAL METHOD						
		Refer to volume 4 The Wallingford Procedure (Vol 4)						
Site								
a	Site area (m2)	n/a						
b	PIMP (%)	0.00%						
A	Site Impermeable Area (m2)	1227						
	M5-60 min rainfall	20			Figure A1		Vol4	
	Ratio "r"	0.4			Figure A2		Vol4	
YEAR	Climate Change %	30			Table B2		PPS 25	
100 Permissible run-off		2.00	litres / s	From Waterco Report				
30 Permissible run-off		2.00	litres / s	From Waterco Report				
Rational Method		Q= Peak flow (=run-off) Q = 2.78 x Cv x Cr x A/10000 x i Where i = rainfall intensity Cr= 1.30 Cv= 0.75 From SUR calcualtions Formula: M5-D = Z1*M5-60 Rainfall intensity (i) = (M5-60)*Z2/Duration per hour Storge = (run-off-permissible discharge) / duration						
		Equation 4 Vol 4						
		100-YEAR STORM						
30 % Include climate change		BRE 365 table A1 =Z1	(M5-D) mins	Vol 4 inrerpolated table A1 =Z2	Storm Duration (mins)	Rainfall intensity (i) (mm/hr)	100 year Rainfall x 30%	Q Run-off (litres/s) Storage Volume required (m3)
		0.617	12.34	1.93	15	95.26	123.84	41.14 35.23
		0.787	15.740	1.98	30	62.33	81.03	26.92 44.86
		0.894	17.880	2.00	45	47.68	61.98	20.59 50.20
		1.000	20.000	2.01	60	40.20	52.26	17.36 55.30
DESIGNED TO 10 HOUR PEAK		1.111	22.220	2.03	90	30.07	39.09	12.99 59.33
		1.223	24.460	2.02	120	24.70	32.12	10.67 62.42
100 year		1.360	27.200	2.01	180	18.22	23.69	7.87 63.40
WORST CASE		1.497	29.940	2.00	240	14.97	19.46	6.47 64.30
240.00 min storage value = 64.30 m3		1.690	33.800	1.97	360	11.10	14.43	4.79 60.33

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	30 year and 100 year STORAGE DRAFT						
	Project	BETTISFIELD WHITCHURCH SY 13 2LN		Scheme number		1549	
				DATE	24-Dec-21	BY	AK
			Sheet 2 of 2		checked		

Z2 = M30 (30 year)

BRE 365 table A1 =Z1		(M5-D) mins	Vol 4 inrerpolated table A1 =Z2	Storm Duration (mins)	Rainfall intensity (i) (mm/hr)	Q Run-off (litres/s)	Storage Volume required (m3)
0.617	12.340	1.535	15	75.77	25.17	20.85	
0.787	15.740	1.56	30	49.11	16.31	25.77	
0.894	17.880	1.57	45	37.43	12.43	28.17	
1.000	20.000	1.58	60	31.60	10.50	30.59	
1.111	22.220	1.575	90	23.33	7.75	31.06	
1.223	24.460	1.57	120	19.20	6.38	31.53	
1.360	27.200	1.56	180	14.14	4.70	29.15	
1.497	29.940	1.55	240	11.60	3.85	26.70	
1.690	33.800	1.525	360	8.59	2.85	18.45	

30 year

WORST CASE

120.00 Min storage value = 31.53 m3

STORAGE REQUIRED;

30 year: 31.53 m3

100 year: 64.30 m3

Storage System: 100 year storm

STORAGE DITCH:

Length(m)	Width (m)	Depth (m)	Total available volume: m3
122.00	1.50	0.35	64.05

Total volume required 64.30 OKAY