

		DRAINAGE CALCULATION - 100 year STORAGE							
KANE DESIGN		PROPOSED: and 30 year STORAGE							
Civil Engineering Design Services 15 Winchester Way, Gresford Wrexham LL12 8HH Tel: 01 9788 855888		Project PLAS POWER ESTATE COEDPOETH		Scheme number 1292 DATE 01-Mar-16		BY AK			
		SMALLER SCHEME REV A		29-Mar-16		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)	22432	Calculated from drawing						
b	PIMP (%)	8.36%	Calculated from scheme drawing and see Volume calculations						
A	Site Impermeable Area (m2)	1876							
	M5-60 min rainfall	17			Figure A1	Vol4			
	Ratio "r"	0.35			Figure A2	Vol4			
YEAR	Climate Change %	30			Table B2	PPS 25			
100	Permissible run-off		litres / s	See accompanying SUR calculations					
USE 1 YEAR FOR FLOW CONTROL FOR BOTH									
	Effect permissible run- off=		litres / s	(permissible run-off less foul drainage)					
30	Permissible run-off	51.77	litres / s	See accompanying Volume calculations					
	BETTERMENT 20 %	41.42	litres / s	(permissible run-off less foul drainage)					
Rational Method		Q= Peak flow (=run-off)							
		$Q = 2.78 \times C_v \times C_r \times A/10000 \times i$							
		Equation 4 Vol 4							
		Where i = rainfall intensity							
		Cr= 1.30							
		Cv= 0.75 From SUR calcuatlions							
Formula:		M5-D = Z1*M5-60							
		Rainfall intensity (i) = (M5-60)*Z2/Duration per hour							
		Storge = (run-off-permissible discharge) / duration							
100-YEAR STORM									
BRE 365 table A1		(M5-D)	Vol 4 inrerpolated table A1	Storm Duration (mins)	Rainfall intensity (i) (mm/hr)	100 year Rainfall x 30%	Q Run-off (litres/s)	Storage Volume required (m3)	
30 % Include climate change		=Z1 mins	=Z2						
		0.617	10.489	1.93	15	80.98	105.27	53.47	10.85
		0.787	13.379	1.98	30	52.98	68.88	34.98	-11.58
		0.894	15.198	2.00	45	40.53	52.69	26.76	-39.57
		1.000	17.000	2.01	60	34.17	44.42	22.56	-67.87
		1.111	18.887	2.03	90	25.56	33.23	16.88	-132.50
		1.223	20.791	2.02	120	21.00	27.30	13.87	-198.36
100 year		1.360	23.120	2.01	180	15.49	20.14	10.23	-336.82
WORST CASE		1.497	25.449	2.00	240	12.72	16.54	8.40	-475.40
15.00 min storage value =		1.690	28.730	1.97	360	9.43	12.26	6.23	-760.04
10.85 m3		1.819	30.923	1.95	480	7.54	9.80	4.98	-1049.44
		1.947	33.099	1.93	600	6.39	8.30	4.22	-1339.12

KANE DESIGN

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DRAINAGE CALCULATION - 100 year STORAGE and 30 year STORAGE

Project

**PLAS POWER ESTATE
COEDPOETH**

Scheme number

1292

DATE

01-Mar-16

BY

AK

SMALLER SCHEME

Sheet 2 of 2

checked

Z2 = M30 (30 year)

30-YEAR STORM

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	10.489	1.535	15	64.40	32.71	-7.83
0.787	13.379	1.56	30	41.74	21.20	-36.38
0.894	15.198	1.57	45	31.81	16.16	-68.19
1.000	17.000	1.58	60	26.86	13.64	-99.98
1.111	18.887	1.575	90	19.83	10.07	-169.25
1.223	20.791	1.57	120	16.32	8.29	-238.51
1.360	23.120	1.56	180	12.02	6.11	-381.34
1.497	25.449	1.55	240	9.86	5.01	-524.26
1.690	28.730	1.525	360	7.30	3.71	-814.47
1.819	30.923	1.513	480	5.85	2.97	-1107.23
1.947	33.099	1.50	600	4.96	2.52	-1400.19

30 year

WORST CASE

15.00 Min storage value =
-7.83 m3

STORAGE REQUIRED

STORAGE REQUIRED;

30 year: -7.83 m3

To be contained in storage system

100 year: 10.85 m3

To be contained in storage system