

		DRAINAGE CALCULATION - 100 year STORAGE						
KANE DESIGN Civil Engineering Design Services 15 Winchester Way, Gresford Wrexham LL12 8HH Tel: 01 9788 855888		PROPOSED: and 30 year STORAGE						
		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 (%)	41.86%	Calculated from scheme drawing and see Volume calculations					
A	Site Impermeable Area (m2)	9391						
	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 30 YEAR FOR FLOW CONTROL FOR BOTH						
	Effect permissible run- off=		litres / s	(permissible run-off less foul drainage)				
	30 Permissible run-off	126.59	litres / s	See accompanying Volume calculations				
	Effect permissible run- off=	126.59	litres / s	(permissible run-off less foul drainage)				
Rational Method		Q= Peak flow (=run-off)						
		Q = 2.78 x Cv x Cr x A/10000 x i				Equation 4	Vol 4	
		Where i = rainfall intensity						
		Cr= 1.30						
		Cv= 0.75 From SUR calcaultions						
Formula:		M5-D = Z1*M5-60						
		Rainfall intensity (i) = (M5-60)*Z2/Duration per hour						
		Storge = (run-off-permissible discharge) / duration						
		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% Run-off (litres/s)	Storage Volume required (m3)
		0.617	10.489	1.93	15	80.98	105.27	267.66 126.96
		0.787	13.379	1.98	30	52.98	68.88	175.13 87.37
		0.894	15.198	2.00	45	40.53	52.69	133.96 19.91
		1.000	17.000	2.01	60	34.17	44.42	112.95 -49.11
		1.111	18.887	2.03	90	25.56	33.23	84.49 -227.34
		1.223	20.791	2.02	120	21.00	27.30	69.41 -411.68
100 year		1.360	23.120	2.01	180	15.49	20.14	51.20 -814.18
WORST CASE		1.497	25.449	2.00	240	12.72	16.54	42.06 -1217.22
15.00 min storage value =		1.690	28.730	1.97	360	9.43	12.26	31.18 -2060.84
126.96 m3		1.819	30.923	1.95	480	7.54	9.80	24.92 -2928.24
		1.947	33.099	1.93	600	6.39	8.30	21.12 -3797.07
		2.020	34.340	1.92	720	5.49	7.14	18.16 -4684.10

KANE DESIGN

Civil Engineering Design Services

15 Winchester Way, Gresford

Wrexham LL12 8HH

Tel: 01 9788 855888

DRAINAGE CALCULATION - 100 year STORAGE

and 30 year STORAGE

Project

PLAS POWER ESTATE
COEDPOETH

Scheme number

1292

DATE

17-Feb-16

BY

AK

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	163.76	33.45
0.787	13.379	1.56	30	41.74	106.14	-36.81
0.894	15.198	1.57	45	31.81	80.89	-123.38
1.000	17.000	1.58	60	26.86	68.30	-209.86
1.111	18.887	1.575	90	19.83	50.42	-411.29
1.223	20.791	1.57	120	16.32	41.50	-612.66
1.360	23.120	1.56	180	12.02	30.57	-1037.03
1.497	25.449	1.55	240	9.86	25.07	-1461.82
1.690	28.730	1.525	360	7.30	18.57	-2333.29
1.819	30.923	1.513	480	5.85	14.87	-3217.52
1.947	33.099	1.50	600	4.96	12.62	-4102.77
2.020	34.340	1.49	720	4.26	10.84	-5000.33

30 year

WORST CASE

15.00 Min storage value =

33.45 m3

STORAGE REQUIRED;

30 year:

33.45 m3

To be contained in storage system

100 year:

126.96 m3

To be contained on site

Storage System: 30 year storm

Use Oversize units:

Totals

USE CELLULAR UNITS

Lgth (m)	Width (m)	Depth (m)	Void Ratio	
8.0	4.0	1.0	0.95	30.40
1.2 m manhole diameter				1.13 m2/ manhole
1.2 m manhole depth /less 450mm cover				
5 Number of manholes				6.79 m3
TOTAL				37.19

TOTAL STORAGE AVAILABLE=

37.19 m3

30 YEAR REQUIRED =

33.45 m3

100 YEAR REQUIRED =:

126.96 m3

less available =

37.19 m3

(plus climate change)

Excess to be retained on site =

89.78 m3