

Proposal: 28 Unit Housing Development
Address: Maes Merddyn, Brynsiencyn LL61 6UW

Initial Drainage Strategy:

Existing drainage

1. The site has no former usage other than agricultural land thus there is no existing drainage on site. There is no foul sewer network adjacent the field with the nearest sewer lying in 3rd party land to the west of the site. There are highway gullies within the existing highway (A4080) which are assumed to connect to a highway drain located in the footway fronting the site.

Foul

1. A S104 agreement is already in place for the offsite sewer based on a former planning approval. This agreement covers the length of pipework from the proposed site entrance to the field adjacent to Awelfryn where an existing foul DCWW chamber is located.
2. A PPA application (**PPA0008568**) was made to DCWW in February 2024 relative to the proposed development of 30 units. The response received 04/03/24 stated that there were no concerns relative to the sewerage network nor treatment works to receive the flows from the development. A preferred connection point was reiterated at chamber SH47678202, being the point of connection that had already been agreed in the s104 referenced above.
3. The onsite foul will be offered for adoption under a separate s104 agreement following detailed design.

Surface Water

Disposal of surface water is summarised as follows:

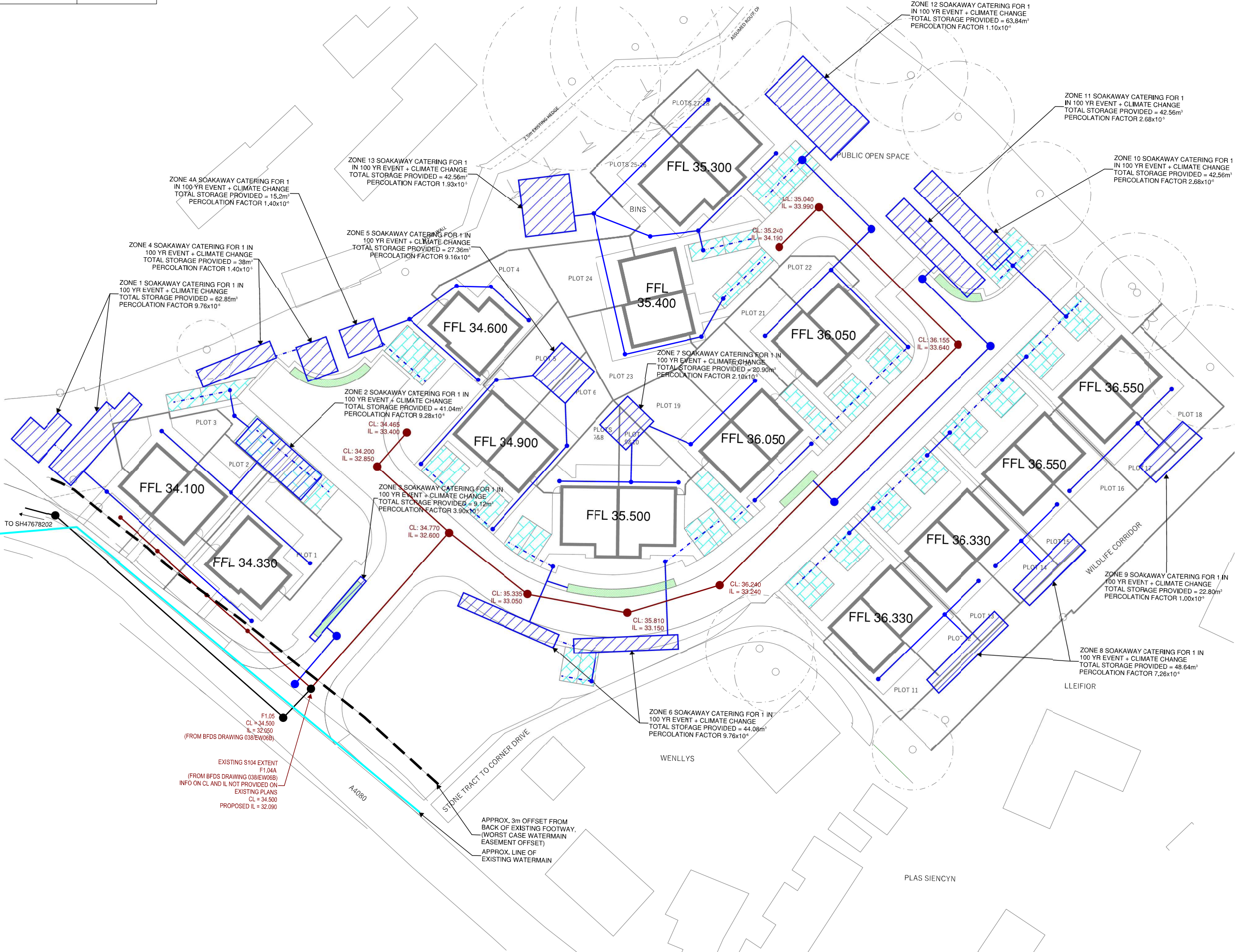
1. Porosity tests have been undertaken which have proven that infiltration is feasible. Multiple soakaways have been proposed throughout the site albeit individual soakaways for each property was not possible as a result of insufficient space relative to the slow rate of infiltration. See attached document 'SK550P03 Proposed Soakaway Zoning and Calculations' and drawing 'SK501P04 Proposed Drainage Scheme'.
2. Trial pits were undertaken prior to the porosity test which indicated groundwater approx. 2m below existing ground level. Groundwater monitoring will be undertaken in conjunction with detailed Site Investigation to determine the groundwater level over a prolonged period to ensure the proposed soakaways are then designed with respect to the groundwater level. See attached document '001P04 Trial Pit & Porosity Test Location Plan & Results Summary'.
3. Should groundwater level be too high to facilitate soakaways then an alternative means of surface water disposal will be required. There are no nearby open waterbodies or SW sewers to facilitate a connection although there is believed to be

a highway sewer in the existing footway fronting the site. There are multiple gullies in the existing highway and DCWW mapping indicates that there are no combined or SW sewers in the highway. If the use of soakaways is ruled out due to high groundwater then a CCTV trace will need to be undertaken to ascertain whether a highway drain is present and whether a connection can be facilitated.

4. The proposals will look to incorporate various SUDS features in order to meet the water quality, amenity and biodiversity requirements, through use of a mixture of raingardens and raised planters and will incorporate porous paving where possible. Re-use of rainwater through harvesting is to be given further consideration during detailed design. See attached document 'Compliance with SAB standard principles'.

Supporting Documents

- 24041/SK501P04 Proposed Drainage Scheme
- 24041/SK550P03 Proposed Soakaway Zoning & Calculations
- 24041/001P04 Trial Pit & Porosity Test Location Plan & Results Summary
- Compliance with SAB Standard Principles



- KEY
- PROPOSED S104 ROUTE APPROVED BY DCWW
 - PROPOSED FOUL SEWER AND MANHOLE CHAMBERS
 - PROPOSED SURFACE WATER DRAIN RUN AND CHAMBERS
 - PROPOSED PERFORATED PIPE
 - PROPOSED SOAKAWAY
 - PROPOSED PERMEABLE PAVING
 - PROPOSED RAINGARDEN VIA HIT AND MISS KERBING ALONGSIDE CARRIAGEWAY

P04	22.11.24	PLOTS IN SOUTH CORNER REMOVED	AV	AC	AC
P03	25.06.24	SITE LAYOUT UPDATED, WATERMAIN EASEMENT ADDED	AV	AC	AC
P02	23.04.24	FURTHER INFORMATION ADDED	AV	AC	AC
REV	DATE	DESCRIPTION	BY	CHK	APP

REVISIONS

NOT FOR CONSTRUCTION

CLIENT



PROJECT Housing Development, Maes Merddyn, Brynsiencyn

TITLE

Proposed Drainage Scheme



DRAWN	AV	CHECKED	AC	PASSED	AC
DATE	18.04.24	CLIENT'S REF.			
SCALE AT A1	1:250	AUTOCAD REF.	24041/Trial Pits		
DRAWING No.	24041/SK501	REVISION	P04		





Soakaway calculations to BRE Digest 365

Project	Maes Merddyn, Brynseincyn
Ref	24041
Description	Zone 1
Calculation Sheet	1
By	AV
Chkd	

1 in 100 year return period design

M5-60min	17
r	0.3

Volumetric Runoff Coefficient	Area
Green	0.35
Impermeable	1
Permeable	0.6

Total Effective Area 720.55

Duration	Z1	M5-D	Z2	M100-D	30% c.c	I	Area	Inflow	Outflow (cu	Storage
5.0	0.34	5.78	1.81	10.5	13.6	163.1	720.6	9.8	0.1	9.71
10.0	0.495	8.42	1.87	15.8	20.5	122.9	720.6	14.8	0.2	14.58
15.0	0.59	10.03	1.91	19.2	24.9	99.6	720.6	17.9	0.3	17.69
30.0	0.78	13.26	1.96	26.0	33.8	67.6	720.6	24.4	0.5	23.85
60.0	1	17.00	2.01	34.1	44.3	44.3	720.6	31.9	1.1	30.89
120.0	1.24	21.08	2.03	42.7	55.5	27.8	720.6	40.0	2.1	37.89
240.0	1.55	26.35	2.00	52.7	68.5	17.1	720.6	49.3	4.2	45.14
360.0	1.8	30.60	1.97	60.1	78.2	13.0	720.6	56.3	6.3	50.02
600.0	2.13	36.21	1.92	69.5	90.4	9.0	720.6	65.1	10.5	54.61
1440.0	2.79	47.43	1.83	86.8	112.9	4.7	720.6	81.3	25.3	56.07
2880.0	3.5	59.50	1.75	103.9	135.0	2.8	720.6	97.3	50.5	46.77

Percolation factor (m/s) 9.76E-06

Stormbloc: Outflow and storage based on:				Stormbloc: Outflow and storage based on:			
Length of soakaway	(m)	5.5		Length of soakaway	(m)	12	
Width of soakaway	(m)	5		Width of soakaway	(m)	4.6	
Effective depth	(m)	0.8		Effective depth	(m)	0.8	
Eff Area of soakaways at 50%	(sq m)	11.15		Eff Area of soakaways at 50%	(sq m)	18.80	
Base included in calcs (FOS 10)				Base included in calcs (FOS 10)			
Storage per soakaway	(cu m)	22		Storage per soakaway	(cu m)	44.16	

Combined Trench storage (cu m) 62.852

Soakaway Check		
Peak required storage	(m3)	50.02
Time for soakaway to lower to 50% volume	(hrs)	23.76



Soakaway calculations to BRE Digest 365

Project	Maes Merddyn, Brynseincyn
Ref	24041
Description	Zone 2
Calculation Sheet	1
By	AV
Chkd	

1 in 100 year return period design

M5-60min	17
r	0.3

Volumetric Runoff Coefficient	Area
Green	0.35
Impermeable	1
Permeable	0.6

Total Effective Area 424.85

Duration	Z1	M5-D	Z2	M100-D	30% c.c	I	Area	Inflow	Outflow (cu	Storage
5.0	0.34	5.78	1.81	10.5	13.6	163.1	424.9	5.8	0.1	5.72
10.0	0.495	8.42	1.87	15.8	20.5	122.9	424.9	8.7	0.1	8.60
15.0	0.59	10.03	1.91	19.2	24.9	99.6	424.9	10.6	0.2	10.43
30.0	0.78	13.26	1.96	26.0	33.8	67.6	424.9	14.4	0.3	14.06
60.0	1	17.00	2.01	34.1	44.3	44.3	424.9	18.8	0.6	18.21
120.0	1.24	21.08	2.03	42.7	55.5	27.8	424.9	23.6	1.2	22.34
240.0	1.55	26.35	2.00	52.7	68.5	17.1	424.9	29.1	2.5	26.61
360.0	1.8	30.60	1.97	60.1	78.2	13.0	424.9	33.2	3.7	29.48
600.0	2.13	36.21	1.92	69.5	90.4	9.0	424.9	38.4	6.2	32.19
1440.0	2.79	47.43	1.83	86.8	112.9	4.7	424.9	48.0	14.9	33.04
2880.0	3.5	59.50	1.75	103.9	135.0	2.8	424.9	57.4	29.8	27.53

Percolation factor (m/s) 9.28E-06

Stormbloc: Outflow and storage based on:

Length of soakaway	(m)	12
Width of soakaway	(m)	4.5
Effective depth	(m)	0.8
Eff Area of soakaways at 50%	(sq m)	18.60
Base included in calcs (FOS 10)		
Storage per soakaway	(cu m)	41.04

Soakaway Check

Peak required storage	(m3)	29.48
Time for soakaway to lower to 50% volume	(hrs)	23.72



Soakaway calculations to BRE Digest 365

Project	Maes Merddyn, Brynseincyn
Ref	24041
Description	Zone 3
Calculation Sheet	1
By	AV
Chkd	

1 in 100 year return period design

M5-60min	17
r	0.3

Volumetric Runoff Coefficient	Area
Green	0.35
Impermeable	1
Permeable	0.6
	212.0

Total Effective Area 212

Duration	Z1	M5-D	Z2	M100-D	30% c.c	I	Area	Inflow	Outflow (cu	Storage
5.0	0.34	5.78	1.81	10.5	13.6	163.1	212.0	2.9	0.1	2.75
10.0	0.495	8.42	1.87	15.8	20.5	122.9	212.0	4.3	0.3	4.07
15.0	0.59	10.03	1.91	19.2	24.9	99.6	212.0	5.3	0.4	4.87
30.0	0.78	13.26	1.96	26.0	33.8	67.6	212.0	7.2	0.8	6.36
60.0	1	17.00	2.01	34.1	44.3	44.3	212.0	9.4	1.6	7.77
120.0	1.24	21.08	2.03	42.7	55.5	27.8	212.0	11.8	3.3	8.51
240.0	1.55	26.35	2.00	52.7	68.5	17.1	212.0	14.5	6.5	8.00
360.0	1.8	30.60	1.97	60.1	78.2	13.0	212.0	16.6	9.8	6.80
600.0	2.13	36.21	1.92	69.5	90.4	9.0	212.0	19.2	16.3	2.88
1440.0	2.79	47.43	1.83	86.8	112.9	4.7	212.0	23.9	39.1	-15.16
2880.0	3.5	59.50	1.75	103.9	135.0	2.8	212.0	28.6	78.2	-49.55

Percolation factor (m/s) 3.90E-05

Stormbloc: Outflow and storage based on:

Length of soakaway	(m)	12
Width of soakaway	(m)	1
Effective depth	(m)	0.8
Eff Area of soakaways at 50%	(sq m)	11.60
Base included in calcs (FOS 10)		
Storage per soakaway	(cu m)	9.12

Soakaway Check

Peak required storage	(m3)	8.51
Time for soakaway to lower to 50% volume	(hrs)	2.61



Soakaway calculations to BRE Digest 365

Project	Maes Merddyn, Brynseincyn
Ref	24041
Description	Zone 4
Calculation Sheet	1
By	AV
Chkd	

1 in 100 year return period design

M5-60min	17
r	0.3

Volumetric Runoff Coefficient	Area
Green	0.35
Impermeable	1
Permeable	0.6

Total Effective Area 532.55

Duration	Z1	M5-D	Z2	M100-D	30% c.c	I	Area	Inflow	Outflow (cu	Storage
5.0	0.34	5.78	1.81	10.5	13.6	163.1	532.6	7.2	0.0	7.20
10.0	0.495	8.42	1.87	15.8	20.5	122.9	532.6	10.9	0.1	10.82
15.0	0.59	10.03	1.91	19.2	24.9	99.6	532.6	13.3	0.1	13.14
30.0	0.78	13.26	1.96	26.0	33.8	67.6	532.6	18.0	0.2	17.76
60.0	1	17.00	2.01	34.1	44.3	44.3	532.6	23.6	0.5	23.11
120.0	1.24	21.08	2.03	42.7	55.5	27.8	532.6	29.6	1.0	28.57
240.0	1.55	26.35	2.00	52.7	68.5	17.1	532.6	36.5	2.0	34.48
360.0	1.8	30.60	1.97	60.1	78.2	13.0	532.6	41.6	3.0	38.65
600.0	2.13	36.21	1.92	69.5	90.4	9.0	532.6	48.1	5.0	43.18
1440.0	2.79	47.43	1.83	86.8	112.9	4.7	532.6	60.1	11.9	48.19
2880.0	3.5	59.50	1.75	103.9	135.0	2.8	532.6	71.9	23.8	48.07

Percolation factor (m/s) 1.40E-05

Stormbloc: Outflow and storage based on:				Stormbloc: Outflow and storage based on:			
Length of soakaway	(m)	5		Length of soakaway	(m)	11	
Width of soakaway	(m)	4.5		Width of soakaway	(m)	2.5	
Effective depth	(m)	0.8		Effective depth	(m)	0.8	
Eff Area of soakaways at 50%	(sq m)	9.85		Eff Area of soakaways at 50%	(sq m)	13.55	
Base included in calcs (FOS 10)				Base included in calcs (FOS 10)			
Storage per soakaway	(cu m)	18		Storage per soakaway	(cu m)	22	

Combined Trench storage (cu m) 38

Soakaway Check		
Peak required storage	(m3)	38.65
Time for soakaway to lower to 50% volume	(hrs)	16.39



Soakaway calculations to BRE Digest 365

Project	Maes Merddyn, Brynseincyn
Ref	24041
Description	Zone 4A
Calculation Sheet	1
By	AV
Chkd	

1 in 100 year return period design

M5-60min	17
r	0.3

Volumetric Runoff Coefficient	Area
Green	0.35
Impermeable	1
Permeable	0.6

Total Effective Area 225.2

Duration	Z1	M5-D	Z2	M100-D	30% c.c	I	Area	Inflow	Outflow (cu	Storage
5.0	0.34	5.78	1.81	10.5	13.6	163.1	225.2	3.1	0.0	3.02
10.0	0.495	8.42	1.87	15.8	20.5	122.9	225.2	4.6	0.1	4.53
15.0	0.59	10.03	1.91	19.2	24.9	99.6	225.2	5.6	0.1	5.49
30.0	0.78	13.26	1.96	26.0	33.8	67.6	225.2	7.6	0.2	7.39
60.0	1	17.00	2.01	34.1	44.3	44.3	225.2	10.0	0.5	9.52
120.0	1.24	21.08	2.03	42.7	55.5	27.8	225.2	12.5	0.9	11.57
240.0	1.55	26.35	2.00	52.7	68.5	17.1	225.2	15.4	1.9	13.57
360.0	1.8	30.60	1.97	60.1	78.2	13.0	225.2	17.6	2.8	14.82
600.0	2.13	36.21	1.92	69.5	90.4	9.0	225.2	20.4	4.6	15.72
1440.0	2.79	47.43	1.83	86.8	112.9	4.7	225.2	25.4	11.1	14.29
2880.0	3.5	59.50	1.75	103.9	135.0	2.8	225.2	30.4	22.3	8.15

Percolation factor (m/s) 1.40E-05

Stormbloc: Outflow and storage based on:

Length of soakaway	(m)	5
Width of soakaway	(m)	4
Effective depth	(m)	0.8
Eff Area of soakaways at 50%	(sq m)	9.20
Base included in calcs (FOS 10)		
Storage per soakaway	(cu m)	15.2

Soakaway Check

Peak required storage	(m3)	14.82
Time for soakaway to lower to 50% volume	(hrs)	15.98



Soakaway calculations to BRE Digest 365

Project	Maes Merddyn, Brynseincyn
Ref	24041
Description	Zone 5
Calculation Sheet	1
By	AV
Chkd	

1 in 100 year return period design

M5-60min	17
r	0.3

Volumetric Runoff Coefficient	Area
Green	0.35
Impermeable	1
Permeable	0.6

Total Effective Area 281.85

Duration	Z1	M5-D	Z2	M100-D	30% c.c	I	Area	Inflow	Outflow (cu	Storage
5.0	0.34	5.78	1.81	10.5	13.6	163.1	281.9	3.8	0.0	3.79
10.0	0.495	8.42	1.87	15.8	20.5	122.9	281.9	5.8	0.1	5.70
15.0	0.59	10.03	1.91	19.2	24.9	99.6	281.9	7.0	0.1	6.91
30.0	0.78	13.26	1.96	26.0	33.8	67.6	281.9	9.5	0.2	9.32
60.0	1	17.00	2.01	34.1	44.3	44.3	281.9	12.5	0.4	12.06
120.0	1.24	21.08	2.03	42.7	55.5	27.8	281.9	15.6	0.9	14.78
240.0	1.55	26.35	2.00	52.7	68.5	17.1	281.9	19.3	1.7	17.56
360.0	1.8	30.60	1.97	60.1	78.2	13.0	281.9	22.0	2.6	19.42
600.0	2.13	36.21	1.92	69.5	90.4	9.0	281.9	25.5	4.4	21.13
1440.0	2.79	47.43	1.83	86.8	112.9	4.7	281.9	31.8	10.4	21.37
2880.0	3.5	59.50	1.75	103.9	135.0	2.8	281.9	38.1	20.9	17.16

Percolation factor (m/s) 9.16E-06

Stormbloc: Outflow and storage based on:

Length of soakaway	(m)	6
Width of soakaway	(m)	6
Effective depth	(m)	0.8
Eff Area of soakaways at 50%	(sq m)	13.20
Base included in calcs (FOS 10)		
Storage per soakaway	(cu m)	27.36

Soakaway Check

Peak required storage	(m3)	19.42
Time for soakaway to lower to 50% volume	(hrs)	22.31



Soakaway calculations to BRE Digest 365

Project	Maes Merddyn, Brynseincyn
Ref	24041
Description	Zone 6
Calculation Sheet	1
By	AV
Chkd	

1 in 100 year return period design

M5-60min	17
r	0.3

Volumetric Runoff Coefficient	Area
Green	0.35
Impermeable	1
Permeable	0.6

Total Effective Area 597.05

Duration	Z1	M5-D	Z2	M100-D	30% c.c	I	Area	Inflow	Outflow (cu	Storage
5.0	0.34	5.78	1.81	10.5	13.6	163.1	597.1	8.1	0.0	8.07
10.0	0.495	8.42	1.87	15.8	20.5	122.9	597.1	12.2	0.1	12.14
15.0	0.59	10.03	1.91	19.2	24.9	99.6	597.1	14.9	0.1	14.74
30.0	0.78	13.26	1.96	26.0	33.8	67.6	597.1	20.2	0.3	19.93
60.0	1	17.00	2.01	34.1	44.3	44.3	597.1	26.5	0.5	25.94
120.0	1.24	21.08	2.03	42.7	55.5	27.8	597.1	33.1	1.1	32.08
240.0	1.55	26.35	2.00	52.7	68.5	17.1	597.1	40.9	2.1	38.76
360.0	1.8	30.60	1.97	60.1	78.2	13.0	597.1	46.7	3.2	43.49
600.0	2.13	36.21	1.92	69.5	90.4	9.0	597.1	54.0	5.3	48.66
1440.0	2.79	47.43	1.83	86.8	112.9	4.7	597.1	67.4	12.7	54.65
2880.0	3.5	59.50	1.75	103.9	135.0	2.8	597.1	80.6	25.5	55.12

Percolation factor	(m/s)	9.16E-06
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Stormbloc: Outflow and storage based on:				Stormbloc: Outflow and storage based on:			
Length of soakaway	(m)	14.5		Length of soakaway	(m)	14.5	
Width of soakaway	(m)	2		Width of soakaway	(m)	2	
Effective depth	(m)	0.8		Effective depth	(m)	0.8	
Eff Area of soakaways at 50%	(sq m)	16.10		Eff Area of soakaways at 50%	(sq m)	16.10	
Base included in calcs (FOS 10)				Base included in calcs (FOS 10)			
Storage per soakaway	(cu m)	23.2		Storage per soakaway	(cu m)	23.2	

Combined Trench storage	(cu m)	44.08
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Soakaway Check		
Peak required storage	(m3)	43.49
Time for soakaway to lower to 50% volume	(hrs)	20.48



Soakaway calculations to BRE Digest 365

Project	Maes Merddyn, Brynseincyn
Ref	24041
Description	Zone 7
Calculation Sheet	1
By	AV
Chkd	

1 in 100 year return period design

M5-60min	17
r	0.3

Volumetric Runoff Coefficient	Area
Green	0.35
Impermeable	1
Permeable	0.6

Total Effective Area 309.05

Duration	Z1	M5-D	Z2	M100-D	30% c.c	I	Area	Inflow	Outflow (cu	Storage
5.0	0.34	5.78	1.81	10.5	13.6	163.1	309.1	4.2	0.1	4.13
10.0	0.495	8.42	1.87	15.8	20.5	122.9	309.1	6.3	0.1	6.19
15.0	0.59	10.03	1.91	19.2	24.9	99.6	309.1	7.7	0.2	7.49
30.0	0.78	13.26	1.96	26.0	33.8	67.6	309.1	10.5	0.4	10.03
60.0	1	17.00	2.01	34.1	44.3	44.3	309.1	13.7	0.8	12.86
120.0	1.24	21.08	2.03	42.7	55.5	27.8	309.1	17.2	1.7	15.47
240.0	1.55	26.35	2.00	52.7	68.5	17.1	309.1	21.2	3.4	17.79
360.0	1.8	30.60	1.97	60.1	78.2	13.0	309.1	24.2	5.1	19.10
600.0	2.13	36.21	1.92	69.5	90.4	9.0	309.1	27.9	8.4	19.51
1440.0	2.79	47.43	1.83	86.8	112.9	4.7	309.1	34.9	20.2	14.65
2880.0	3.5	59.50	1.75	103.9	135.0	2.8	309.1	41.7	40.5	1.26

Percolation factor (m/s) 2.10E-05

Stormbloc: Outflow and storage based on:

Length of soakaway (m)	5.5
Width of soakaway (m)	5
Effective depth (m)	0.8
Eff Area of soakaways at 50% (sq m)	11.15
Base included in calcs (FOS 10)	
Storage per soakaway (cu m)	20.9

Soakaway Check

Peak required storage (m3)	19.10
Time for soakaway to lower to 50% volume (hrs)	11.33



Soakaway calculations to BRE Digest 365

Project	Maes Merddyn, Brynseincyn
Ref	24041
Description	Zone 8
Calculation Sheet	1
By	AV
Chkd	

1 in 100 year return period design

M5-60min	17
r	0.3

Volumetric Runoff Coefficient	Area
Green	0.35
Impermeable	1
Permeable	0.6

Total Effective Area 424.4

Duration	Z1	M5-D	Z2	M100-D	30% c.c	I	Area	Inflow	Outflow (cu	Storage
5.0	0.34	5.78	1.81	10.5	13.6	163.1	424.4	5.8	0.0	5.74
10.0	0.495	8.42	1.87	15.8	20.5	122.9	424.4	8.7	0.1	8.64
15.0	0.59	10.03	1.91	19.2	24.9	99.6	424.4	10.6	0.1	10.49
30.0	0.78	13.26	1.96	26.0	33.8	67.6	424.4	14.4	0.2	14.19
60.0	1	17.00	2.01	34.1	44.3	44.3	424.4	18.8	0.3	18.48
120.0	1.24	21.08	2.03	42.7	55.5	27.8	424.4	23.6	0.7	22.89
240.0	1.55	26.35	2.00	52.7	68.5	17.1	424.4	29.1	1.3	27.73
360.0	1.8	30.60	1.97	60.1	78.2	13.0	424.4	33.2	2.0	31.17
600.0	2.13	36.21	1.92	69.5	90.4	9.0	424.4	38.4	3.3	35.02
1440.0	2.79	47.43	1.83	86.8	112.9	4.7	424.4	47.9	8.0	39.87
2880.0	3.5	59.50	1.75	103.9	135.0	2.8	424.4	57.3	16.1	41.24

Percolation factor (m/s) 7.26E-06

Stormbloc: Outflow and storage based on:				Stormbloc: Outflow and storage based on:			
Length of soakaway	(m)	8		Length of soakaway	(m)	8	
Width of soakaway	(m)	4		Width of soakaway	(m)	4	
Effective depth	(m)	0.8		Effective depth	(m)	0.8	
Eff Area of soakaways at 50%	(sq m)	12.80		Eff Area of soakaways at 50%	(sq m)	12.80	
Base included in calcs (FOS 10)				Base included in calcs (FOS 10)			
Storage per soakaway	(cu m)	25.6		Storage per soakaway	(cu m)	25.6	

Combined Trench storage (cu m) 48.64

Soakaway Check		
Peak required storage	(m3)	31.17
Time for soakaway to lower to 50% volume	(hrs)	23.29



Soakaway calculations to BRE Digest 365

Project	Maes Merddyn, Brynseincyn
Ref	24041
Description	Zone 9
Calculation Sheet	1
By	AV
Chkd	

1 in 100 year return period design

M5-60min	17
r	0.3

Volumetric Runoff Coefficient	Area
Green	0.35
Impermeable	1
Permeable	0.6

Total Effective Area 293

Duration	Z1	M5-D	Z2	M100-D	30% c.c	I	Area	Inflow	Outflow (cu	Storage
5.0	0.34	5.78	1.81	10.5	13.6	163.1	293.0	4.0	0.0	3.95
10.0	0.495	8.42	1.87	15.8	20.5	122.9	293.0	6.0	0.1	5.93
15.0	0.59	10.03	1.91	19.2	24.9	99.6	293.0	7.3	0.1	7.19
30.0	0.78	13.26	1.96	26.0	33.8	67.6	293.0	9.9	0.2	9.70
60.0	1	17.00	2.01	34.1	44.3	44.3	293.0	13.0	0.4	12.56
120.0	1.24	21.08	2.03	42.7	55.5	27.8	293.0	16.3	0.8	15.42
240.0	1.55	26.35	2.00	52.7	68.5	17.1	293.0	20.1	1.7	18.37
360.0	1.8	30.60	1.97	60.1	78.2	13.0	293.0	22.9	2.5	20.36
600.0	2.13	36.21	1.92	69.5	90.4	9.0	293.0	26.5	4.2	22.24
1440.0	2.79	47.43	1.83	86.8	112.9	4.7	293.0	33.1	10.2	22.88
2880.0	3.5	59.50	1.75	103.9	135.0	2.8	293.0	39.6	20.4	19.17

Percolation factor (m/s) 1.00E-05

Stormbloc: Outflow and storage based on:

Length of soakaway (m)	6
Width of soakaway (m)	5
Effective depth (m)	0.8
Eff Area of soakaways at 50% (sq m)	11.80
Base included in calcs (FOS 10)	
Storage per soakaway (cu m)	22.8

Soakaway Check

Peak required storage (m3)	20.36
Time for soakaway to lower to 50% volume (hrs)	23.96



Soakaway calculations to BRE Digest 365

Project	Maes Merddyn, Brynseincyn
Ref	24041
Description	Zone 10
Calculation Sheet	1
By	AV
Chkd	

1 in 100 year return period design

M5-60min	17
r	0.3

Volumetric Runoff Coefficient	Area
Green	0.35
Impermeable	1
Permeable	0.6

Total Effective Area 680.45

Duration	Z1	M5-D	Z2	M100-D	30% c.c	I	Area	Inflow	Outflow (cu	Storage
5.0	0.34	5.78	1.81	10.5	13.6	163.1	680.5	9.2	0.2	9.08
10.0	0.495	8.42	1.87	15.8	20.5	122.9	680.5	13.9	0.3	13.59
15.0	0.59	10.03	1.91	19.2	24.9	99.6	680.5	17.0	0.5	16.44
30.0	0.78	13.26	1.96	26.0	33.8	67.6	680.5	23.0	1.0	21.99
60.0	1	17.00	2.01	34.1	44.3	44.3	680.5	30.2	2.0	28.12
120.0	1.24	21.08	2.03	42.7	55.5	27.8	680.5	37.8	4.1	33.68
240.0	1.55	26.35	2.00	52.7	68.5	17.1	680.5	46.6	8.2	38.42
360.0	1.8	30.60	1.97	60.1	78.2	13.0	680.5	53.2	12.3	40.92
600.0	2.13	36.21	1.92	69.5	90.4	9.0	680.5	61.5	20.5	41.06
1440.0	2.79	47.43	1.83	86.8	112.9	4.7	680.5	76.8	49.1	27.71
2880.0	3.5	59.50	1.75	103.9	135.0	2.8	680.5	91.9	98.2	-6.31

Percolation factor	(m/s)	2.68E-05
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Stormbloc: Outflow and storage based on:		
Length of soakaway	(m)	16
Width of soakaway	(m)	3.5
Effective depth	(m)	0.8
Eff Area of soakaways at 50%	(sq m)	21.20
Base included in calcs (FOS 10)		
Storage per soakaway	(cu m)	42.56

Soakaway Check		
Peak required storage	(m3)	40.92
Time for soakaway to lower to 50% volume	(hrs)	10.00



Soakaway calculations to BRE Digest 365

Project	Maes Merddyn, Brynseincyn
Ref	24041
Description	Zone 11
Calculation Sheet	1
By	AV
Chkd	

1 in 100 year return period design

M5-60min	17
r	0.3

Volumetric Runoff Coefficient	Area
Green	0.35
Impermeable	1
Permeable	0.6

Total Effective Area 672.25

Duration	Z1	M5-D	Z2	M100-D	30% c.c	I	Area	Inflow	Outflow (cu	Storage
5.0	0.34	5.78	1.81	10.5	13.6	163.1	672.3	9.1	0.2	8.97
10.0	0.495	8.42	1.87	15.8	20.5	122.9	672.3	13.8	0.3	13.43
15.0	0.59	10.03	1.91	19.2	24.9	99.6	672.3	16.7	0.5	16.23
30.0	0.78	13.26	1.96	26.0	33.8	67.6	672.3	22.7	1.0	21.72
60.0	1	17.00	2.01	34.1	44.3	44.3	672.3	29.8	2.0	27.76
120.0	1.24	21.08	2.03	42.7	55.5	27.8	672.3	37.3	4.1	33.23
240.0	1.55	26.35	2.00	52.7	68.5	17.1	672.3	46.0	8.2	37.86
360.0	1.8	30.60	1.97	60.1	78.2	13.0	672.3	52.6	12.3	40.28
600.0	2.13	36.21	1.92	69.5	90.4	9.0	672.3	60.8	20.5	40.31
1440.0	2.79	47.43	1.83	86.8	112.9	4.7	672.3	75.9	49.1	26.79
2880.0	3.5	59.50	1.75	103.9	135.0	2.8	672.3	90.8	98.2	-7.42

Percolation factor (m/s) 2.68E-05

Stormbloc: Outflow and storage based on:

Length of soakaway (m)	16
Width of soakaway (m)	3.5
Effective depth (m)	0.8
Eff Area of soakaways at 50% (sq m)	21.20
Base included in calcs (FOS 10)	
Storage per soakaway (cu m)	42.56

Soakaway Check

Peak required storage (m3)	40.28
Time for soakaway to lower to 50% volume (hrs)	9.85



Soakaway calculations to BRE Digest 365

Project	Maes Merddyn, Brynseincyn
Ref	24041
Description	Zone 12
Calculation Sheet	1
By	AV
Chkd	

1 in 100 year return period design

M5-60min	17
r	0.3

Volumetric Runoff Coefficient	Area
Green	0.35
Impermeable	1
Permeable	0.6

Total Effective Area 706.15

Duration	Z1	M5-D	Z2	M100-D	30% c.c	I	Area	Inflow	Outflow (cu	Storage
5.0	0.34	5.78	1.81	10.5	13.6	163.1	706.2	9.6	0.1	9.51
10.0	0.495	8.42	1.87	15.8	20.5	122.9	706.2	14.5	0.2	14.29
15.0	0.59	10.03	1.91	19.2	24.9	99.6	706.2	17.6	0.3	17.33
30.0	0.78	13.26	1.96	26.0	33.8	67.6	706.2	23.9	0.5	23.37
60.0	1	17.00	2.01	34.1	44.3	44.3	706.2	31.3	1.0	30.27
120.0	1.24	21.08	2.03	42.7	55.5	27.8	706.2	39.2	2.1	37.13
240.0	1.55	26.35	2.00	52.7	68.5	17.1	706.2	48.4	4.1	44.22
360.0	1.8	30.60	1.97	60.1	78.2	13.0	706.2	55.2	6.2	48.99
600.0	2.13	36.21	1.92	69.5	90.4	9.0	706.2	63.8	10.4	53.48
1440.0	2.79	47.43	1.83	86.8	112.9	4.7	706.2	79.7	24.9	54.85
2880.0	3.5	59.50	1.75	103.9	135.0	2.8	706.2	95.3	49.7	45.63

Percolation factor (m/s) 1.10E-05

Stormbloc: Outflow and storage based on:		
Length of soakaway	(m)	13
Width of soakaway	(m)	7.5
Effective depth	(m)	0.8
Eff Area of soakaways at 50%	(sq m)	26.15
Base included in calcs (FOS 10)		
Storage per soakaway	(cu m)	74.1

Soakaway Check		
Peak required storage	(m3)	48.99
Time for soakaway to lower to 50% volume	(hrs)	23.65



Soakaway calculations to BRE Digest 365

Project	Maes Merddyn, Brynseincyn
Ref	24041
Description	Zone 13
Calculation Sheet	1
By	AV
Chkd	

1 in 100 year return period design

M5-60min	17
r	0.3

Volumetric Runoff Coefficient	Area
Green	0.35
Impermeable	1
Permeable	0.6

Total Effective Area 615.05

Duration	Z1	M5-D	Z2	M100-D	30% c.c	I	Area	Inflow	Outflow (cu	Storage
5.0	0.34	5.78	1.81	10.5	13.6	163.1	615.1	8.4	0.1	8.26
10.0	0.495	8.42	1.87	15.8	20.5	122.9	615.1	12.6	0.2	12.39
15.0	0.59	10.03	1.91	19.2	24.9	99.6	615.1	15.3	0.3	15.02
30.0	0.78	13.26	1.96	26.0	33.8	67.6	615.1	20.8	0.6	20.19
60.0	1	17.00	2.01	34.1	44.3	44.3	615.1	27.3	1.2	26.04
120.0	1.24	21.08	2.03	42.7	55.5	27.8	615.1	34.1	2.4	31.70
240.0	1.55	26.35	2.00	52.7	68.5	17.1	615.1	42.1	4.9	37.23
360.0	1.8	30.60	1.97	60.1	78.2	13.0	615.1	48.1	7.3	40.74
600.0	2.13	36.21	1.92	69.5	90.4	9.0	615.1	55.6	12.2	43.37
1440.0	2.79	47.43	1.83	86.8	112.9	4.7	615.1	69.4	29.3	40.07
2880.0	3.5	59.50	1.75	103.9	135.0	2.8	615.1	83.0	58.7	24.34

Percolation factor (m/s) 1.93E-05

Stormbloc: Outflow and storage based on:




Length of soakaway	(m)	8
Width of soakaway	(m)	7
Effective depth	(m)	0.8
Eff Area of soakaways at 50%	(sq m)	17.60
Base included in calcs (FOS 10)		
Storage per soakaway	(cu m)	42.56

Soakaway Check

Peak required storage	(m3)	40.74
Time for soakaway to lower to 50% volume	(hrs)	16.66



KEY

- THX
 TRIAL HOLE TO DETERMINE UNDERLYING STRATA FOR POROSITY TEST
- TPX
 POROSITY TEST
- TPX
 POROSITY TEST UNDERTAKEN BY BFDS

P04	22.11.24	PLOTS IN SOUTH CORNER REMOVED	AV		
P03	24.06.24	SITE LAYOUT UPDATED	AV		
P02	16.04.24	POROSITY PIT LOCATIONS & RESULTS BY BFDs ADDED	AV		
REV	DATE	DESCRIPTION	BY	CHK	APP

REVISIONS

CLIENT _____



PROJECT Housing Development,
Maes Merddyn,
Brynsiencyn

TITLE

Trial Pit & Porosity Test
Location Plan & Results



DRAWN AV		CHECKED	PASSED
DATE 12.04.24		CLIENT'S REF.	
SCALE AT A1 1:250		AUTOCAD REF. 24041/Trial Pits	
DRAWING No. 24041/001			REVISION P04

Porosity Results Summary Undertaken By Datrys / Williams Homes 09-10/04/24

Porosity Results					
		Depth (m)	Soil Infiltration Rate (m/s)	Vp Rate (m/s)	Comments
TP1	Test 1	1.51	9.28E-06	-	Passed
	Test 2	1.43	1.44E-05	-	Passed
	Test 3	Insufficient time to complete			
TP2	Test 1	1.52	2.28E-05	-	Passed
	Test 2	1.52	9.16E-06	-	Passed
	Test 3	1.46	1.31E-05	-	Passed
TP3	Test 1	0.87	8.26E-06	-	Passed
	Test 2	0.87	7.26E-06	-	Passed
	Test 3	Insufficient time to complete			
TP4	Test 1	1.70	1.93E-05	-	Passed
	Test 2	1.70	2.27E-05	-	Passed
	Test 3	1.61	2.22E-05	-	Passed
TP5	Test 1	1.55	1.08E-05	-	Passed
	Test 2	1.55	1.55E-05	-	Passed
	Test 3	1.56	1.40E-05	-	Passed
TP6	Test 1	1.50	1.10E-05	-	Passed
	Test 2	1.54	1.54E-05	-	Passed
	Test 3	1.55	1.46E-05	-	Passed
TP7	Test 1	1.15	9.76E-06	-	Passed
TP8	Test 1	1.65	2.68E-05	-	Passed
	Test 2	1.65	2.87E-05	-	Passed
	Test 3	1.53	4.76E-05	-	Passed

Porosity Results Summary Undertaken By BFDS 11/01/2016

Porosity Results					
		Depth (m)	Soil Infiltration Rate (m/s)	Vp Rate (m/s)	Comments
TH1	Test 1	1.245	1.40E-05	-	Passed
TH2	Test 1	1.245	2.10E-05	-	Passed
TH3	Test 1	1.035	6.70E-06	-	Passed
TH4	Test 1	0.55	1.00E-05	-	Passed
TH5	Test 1	Ground unsuitable			
TP6	Test 1	1.10	3.90E-05	-	Passed
TP7	Test 1	1.15	6.40E-05	-	Passed

Standard Principles

The Principles listed below will underpin the design of surface water management schemes to meet the Statutory National Standards. Where possible, please provide a brief summary in each of the boxes below relating to each of the bulleted Standard Principles and itemised Standards 1 to 6, showing how your proposed surface water drainage scheme complies with this statutory requirement.

Compliance with Standard Principles

My proposed surface water drainage scheme will comply in the following way/s:

Re-use will be incorporated in the form water butts and raised planters. Regardless of the provision for reuse, a formal method for disposal must be provided to address excess volumes beyond that of which the above methods provide. Infiltration testing has been undertaken and the ground has been proven to be feasible for infiltration thus no water will leave the site up to the threshold design event.

The SuDS features are used in sequence as a management train with the intention of improving the water quality, ensuring pollution is prevented at source (or near to) as well as providing benefits in amenity and biodiversity.

The surface water will be collected via raingardens, permeable surfacing and rainwater gullies then routed through the piped network to a soakaway systems. The soakaways are designed for 1 in 100 year plus 30% climate change allowance.

A maintenance plan will be provided to ensure the adequacy of the drainage into the long term future. Chambers or access via rodding eyes will be provided at heads of runs to ensure the system can be appropriately maintained e.g. jetting.

Standards 1 to 6

Compliance with Standard S1 - Surface water runoff destination

My proposed surface water drainage scheme will comply in the following way/s:

Re-use will be incorporated in the form of raingardens, water butts and raised planters.

The underlying strata was determined through testing to have a reasonably consistent degree of infiltration capacity throughout the site which ranged from 4.76×10^{-5} to 9.16×10^{-6} with the exception of southeastern part of the site which ranged from 8.26×10^{-6} to 6.70×10^{-5} . Despite the relatively slow rate achieved in some of the test locations, the area and depth available for soakaways has allowed for suitable design solutions to be achieved. As infiltration is feasible, the surface water will be discharged to ground at various locations across the site rather than seeking an offsite solution.

Compliance with Standard S2 - Surface water runoff hydraulic control

My proposed surface water drainage scheme will comply in the following way/s:

The proposal directs surface water runoff to ground at depth below the existing upper clay strata thus invariably improves the runoff scenario in comparison to the existing site, despite the significant increase in impermeable surfaces. Permeable paving and raingardens will also slow the rate of conveyance to the soakaways. Given the use of infiltration, there will be no discharge from the proposed site that results from the first 5mm of any rainfall event.

Compliance with Standard S3 – Water Quality

My proposed surface water drainage scheme will comply in the following way/s:

A pollution risk may arise from petrol or oil spillage from vehicles using the site. The drainage of the car parking and access road form a part of the general site surface water drainage system and will need to be subjected to some form of treatment.

The risk of pollution is considered to be low and methods of control suggested in the SuDS Manual are used. Table 26.2 of the SuDS Manual identifies this site as a low pollution hazard level with indices varying between 0.4 – 0.5. Table 26.4 suggests permeable paving offers a mitigation index of 0.6 - 0.7, while the other SuDS features also offer the following mitigation indices; Raingardens (bio-infiltration) = 0.8

The sub-base of the permeable paving provide an effective measure to trap suspended solids and hydrocarbons thus improving the water quality before discharging into the onsite pipe network and subsequently the soakaways. Construction details of the SuDS features including linings, geotextile filters etc. are to be included upon the details drawings.

The SuDS features in the scheme will be connected in series to achieve a robust surface water management train providing effective treatment for contaminants by offering the chance for settlement of sediments and interception of hydrocarbons.

Compliance with Standard S4 – Amenity

My proposed surface water drainage scheme will comply in the following way/s:

The use of permeable paving within the site promotes multi-functionality, whilst the allowance of climate change and urban creep aids the developments resilience to future change.

SuDS features such as the raingardens along the roadside will provide aesthetically pleasing vegetated zones and will improve the amenity of the site, as well as serving a purpose.

The various SuDS features maximise legibility of the water network whilst conveying waters through the site. The SuDS features will be considered further within the landscaping design which will determine suitable vegetation for incorporation.

Compliance with Standard S5 – Biodiversity

My proposed surface water drainage scheme will comply in the following way/s:

The proposals promote biodiversity by introducing raingardens to serve the highway runoff rather than formal gullies, whilst individual plots will introduce various local features such as raised planters at downpipes or the use of raingardens.

The vegetation within the raingardens will provide food, shelter and habitat for birds, small mammals and insects and will act as bridges, maintaining connectivity for certain species.

A landscape plan has been produced accounting for appropriate vegetation throughout the site including for above the various soakaways being incorporated.

Compliance with Standard S6 – Design of drainage for Construction and Maintenance and Structural Integrity

My proposed surface water drainage scheme will comply in the following way/s:

All SuDS features will be installed by a competent contractor and will be situated in locations and at shallow depths where they can be easily maintained.

A maintenance plan will state the maintenance requirements for the SuDS features in order for them to remain at their optimum capacity.

All materials and components, where possible, will have a minimum design life equivalent to the design life of the development, including an appropriate factor of safety.