GWP Property Services

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Soakaway Calculations

Property Details: **63 Brecon Rise**
Pant
Merthyr Tydfil
CF48 2EE

Client Details: **Mr M Phillips**

Contents:
Instruction

1 Site Plans
2 Soakaway Size
3 Soakaway Calculations
4 Infiltration Test Results
5 Maintenance Details

Instruction
To design 2 Soakaways to receive surface water from an impermeable area of 98.4m^2
Soakaway 1: Drive/Parking area.: Receiving discharge from 71m^2
Soakaway 2: Rear Patio: Receiving discharge from 27m^2

Infiltration Testing:
On site infiltration Testing was undertaken by Gibbs Geotechnical Services to the requirement of BRE 365 (2016)
A ground water check test hole was dug; no groundwater was found in the test hole.

Soakaway 1
Dwelling Drive
The Sub Base Soakaway is to be located is to be located beneath the Drive/Parking area at the development site.
Based on infiltration data supplied a Stone Sub Base of 655mm will be required
See detail in drawing 04 attached

Soakaway 2
Rear Patio
The Sub Base Soakaway is to be located is to be located beneath the Patio area at the development site.
Based on infiltration data supplied a Stone Sub Base of 510mm will be required
See detail in drawing 05 attached

Rear Path
Infiltration Subbase beneath the rear path to be 150mm thick

Site Plans

DPH ARCHITECT

Revision	Date	Description	Issued
A	05.06.25	Site Area increased, building moved further from south-western corner	
B	10.06.25	Side extension to No.63 removed, area added as front garden, kitchen window relocated	
C	24.07.25	Scheme amended following Pre-App feedback - Design changed to bungalow and plot amended	
D	02.09.25	Existing house updated to reflect PD consent for rear extension	
E	13.02.26	Building footprint amended - southern wing reduced slightly to achieve 1.1m clearance to rear boundary for drainage	

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Client: MATTHEW PHILIPS

Project: 63 BRECON RISE, PANT, MERTHYR TYDFIL, CF48 2EE

Drawing: CONTEXTUAL SITE PLAN

Scale @ A3	Date	Drawn	Checked
1 : 200	01/07/25	DPH	Checker

Job No.	Dwg No.	Revision	Status
140	PL01	E	PLANNING

DPH ARCHITECT
6 WEST GROVE
MERTHYR TYDFIL
CF47 8HJ
T: 07947 243847
www.dpharchitect.co.uk

North Elevation

1 : 100

East Elevation

1 : 100

DPH ARCHITECT

Revision	Date	Description	Issued
A	05.06.25	Site Area increased, building moved further from south-western corner	
B	10.06.25	Side extension to No.63 removed, area added as front garden, kitchen window relocated	
C	24.07.25	Scheme amended following Pre-App feedback - Design changed to bungalow and plot amended	
D	30.10.25	Front Door and porch amended - North Elevation	
E	13.02.26	Building footprint amended - southern wing reduced slightly to achieve 1.1m clearance to rear boundary for drainage	

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Client
MATTHEW PHILIPS

Project
63 BRECON RISE, PANT, MERTHYR TYDFIL, CF48 2EE

Drawing
Elevations - North & East

Scale @ A3	Date	Drawn	Checked
1 : 100	08.05.2025	DPH	-

Job No.	Dwg No.	Revision	Status
140	PL 05	E	PLANNING

DPH ARCHITECT
6 WEST GROVE
MERTHYR TYDFIL
CF 47 8HJ
T: 07947 243847
www.dpharchitect.co.uk

South Elevation

1 : 100

West Elevation

1 : 100

DPH ARCHITECT

Revision	Date	Description	Issued
A	05.06.25	Site Area increased, building moved further from south-western corner	
B	10.06.25	Side extension to No.63 removed, area added as front garden, kitchen window relocated	
C	24.07.25	Scheme amended following Pre-App feedback - Design changed to bungalow and plot amended	
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MATERIAL SCHEDULE:

WALLS - Off-white coloured render
ROOF - Brown concrete tiles to match existing house
WINDOWS - Dark Grey PVCu
DOORS - Dark grey PVCu / Composite
RAINWATER GOODS - Black PVCu
FASCIAS / SOFFITS - Dark Grey PVCu

Client: MATTHEW PHILIPS

Project: 63 BRECON RISE, PANT, MERTHYR TYDFIL, CF48 2EE

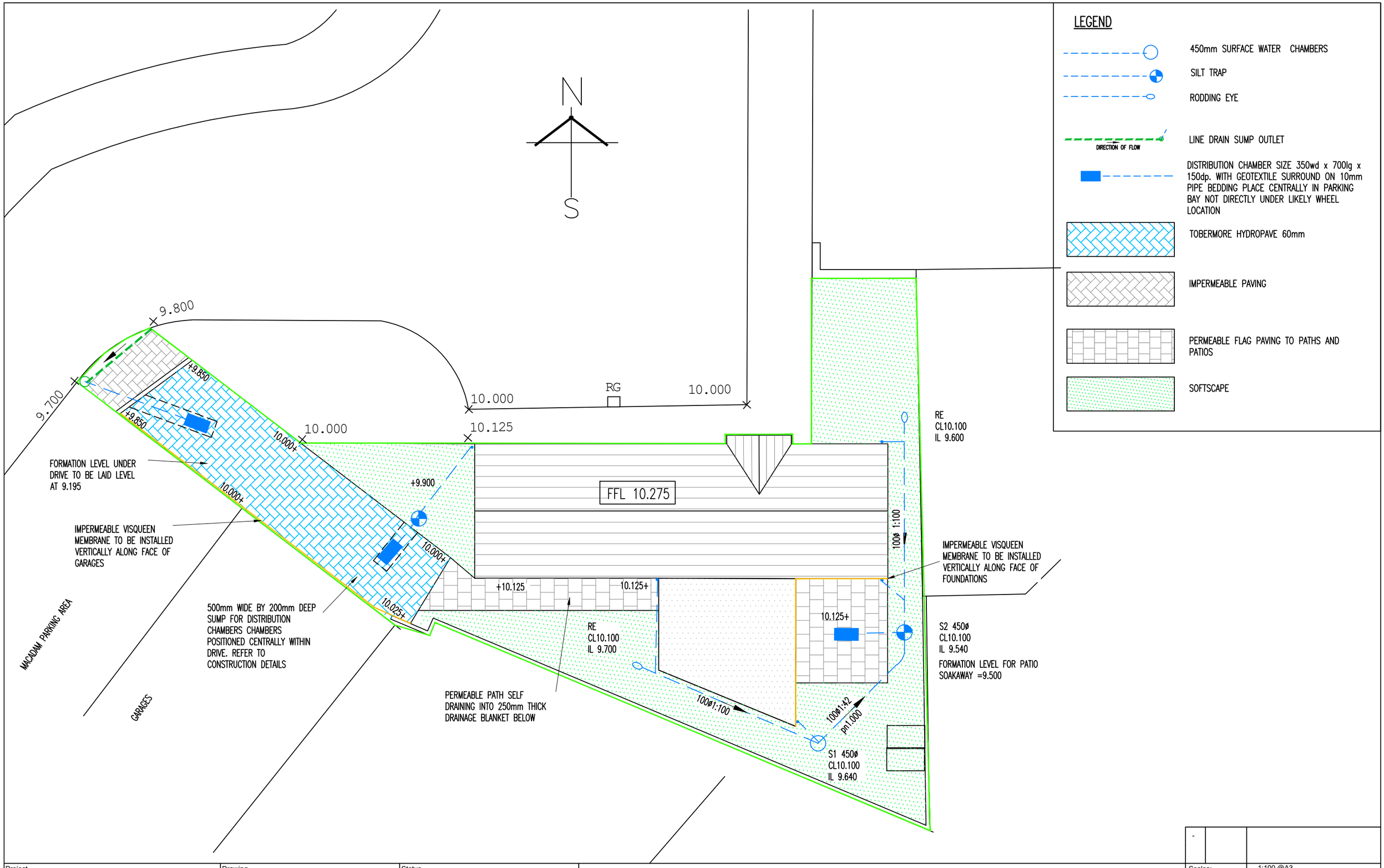
Drawing: Elevations - South & West

Scale @ A3	Date	Drawn	Checked
1 : 100	08.05.2025	DPH	-

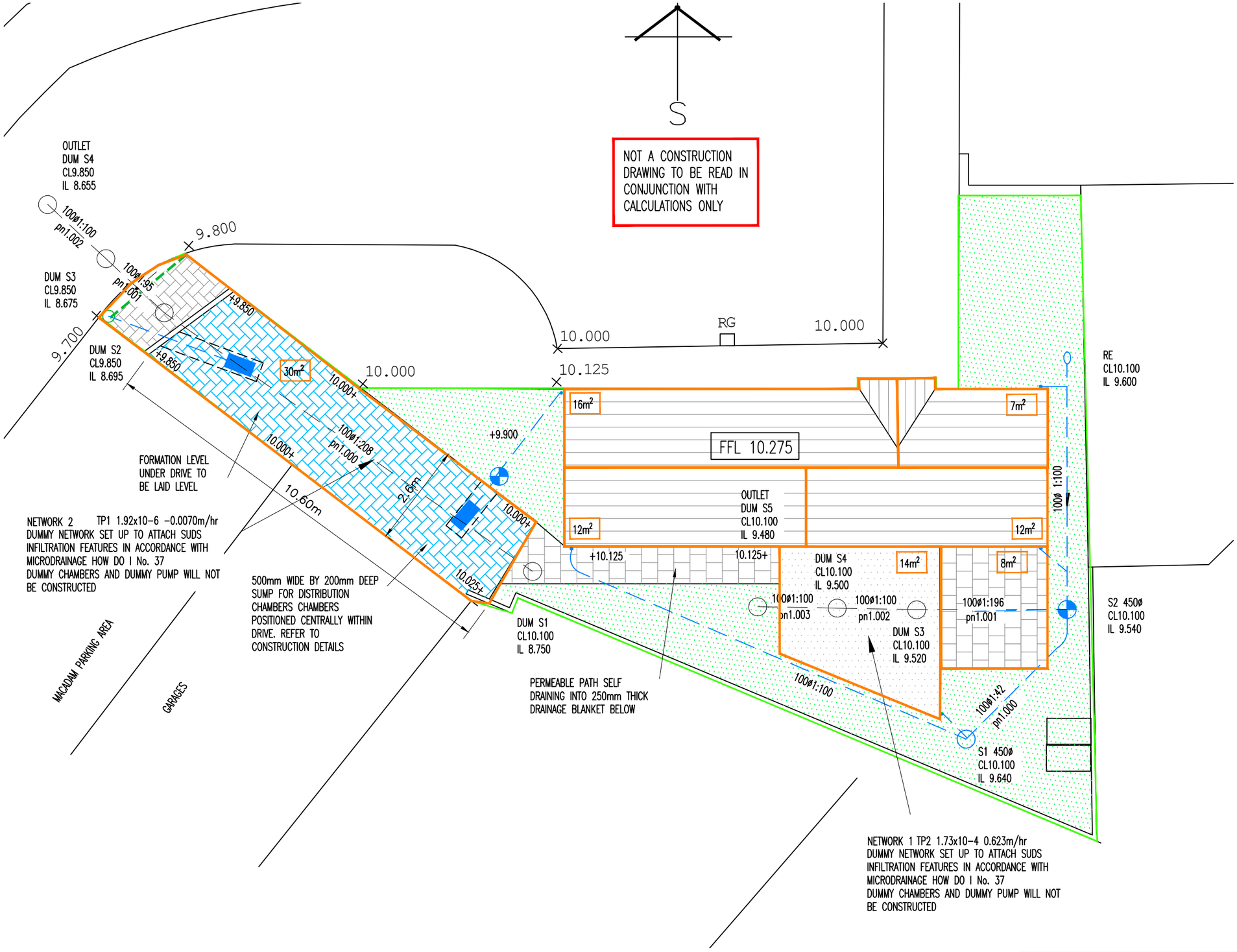
Job No.	Dwg No.	Revision	Status
140	PL 06	E	PLANNING

DPH ARCHITECT
6 WEST GROVE
MERTHYR TYDFIL
CF47 8HJ
T: 07947 243847
www.dpharchitect.co.uk

Soakaway Size



Project.	Drawing	Status			
PROPOSED PLOTS ADJACENT 63 BRECON RISE, PANT, MERTHYR TYDFIL CF48 2EE	PROPOSED DRAINAGE LAYOUT	APPROVAL		Scales:	1:100 @A3
				Date:	AUGUST 2026
				Drawing Number:	01



NETWORK 1 PERMEABLE PATIO TP2 1.73x10-4 0.623m/hr

10m² CATCHMENT AREA USED FOR CALCULATIONS

TOTAL SITE AREA 172m²

PIPE NUMBER	CATCHMENT	TOTAL	MICRO DRAINAGE	LOCATION
1.000	12m²	12m²	10m²	ROOF
1.001	7m² 12m² 14m² 8m²	41m²	40m²	ROOF PERMEABLE PATIO
1.002 1.003		0m²	0m²	
TOTAL		53m²	50m²	

MICRODRAINAGE UNITS INPUT MUST BE IN UNITS OF 10. ROUNDING UP AND DOWN OCCURS FOR BALANCE.11% URBAN CREEP ALSO ADDED AS ADDITIONAL FLOW IN MICRODRAINAGE CALCULATIONS TO MAKE UP FOR LOWER MICRODRAINAGE UNITS THEREFORE DESIGN IS ROBUST AND EXCEEDANCE LIMITED

NETWORK 2 PERMEABLE PARKING AND ROOF TP1 1.92x10-6 -0.00691m/hr

30m² CATCHMENT AREA USED FOR CALCULATIONS

PIPE NUMBER	CATCHMENT	TOTAL	MICRO DRAINAGE	LOCATION
1.000	16m² 12m² 16m²	28m² 16m²	30m² 20m²	ROOF
1.001	30m²	30m²	30m²	DRIVE
1.002	0m²	0m²	0m²	
TOTAL		58m²	60m²	

MICRODRAINAGE UNITS INPUT MUST BE IN UNITS OF 10. ROUNDING UP AND DOWN OCCURS FOR BALANCE. MICRODRAINAGE INPUT IS GREATER THAN ACTUAL CATCHMENT.

-		

Project.	Drawing	Status			
PROPOSED PLOTS ADJACENT 63 BRECON RISE, PANT, MERTHYR TYDFIL CF48 2EE	CONTRIBUTING AREA PLAN	APPROVAL		Scales:	1:100 @A3
				Date:	AUGUST 2026
				Drawing Number:	02

TYPICAL ACCESS CHAMBER DETAIL SIC 250 OR RANGE 315 SITED SOFT LANDSCAPE AREA

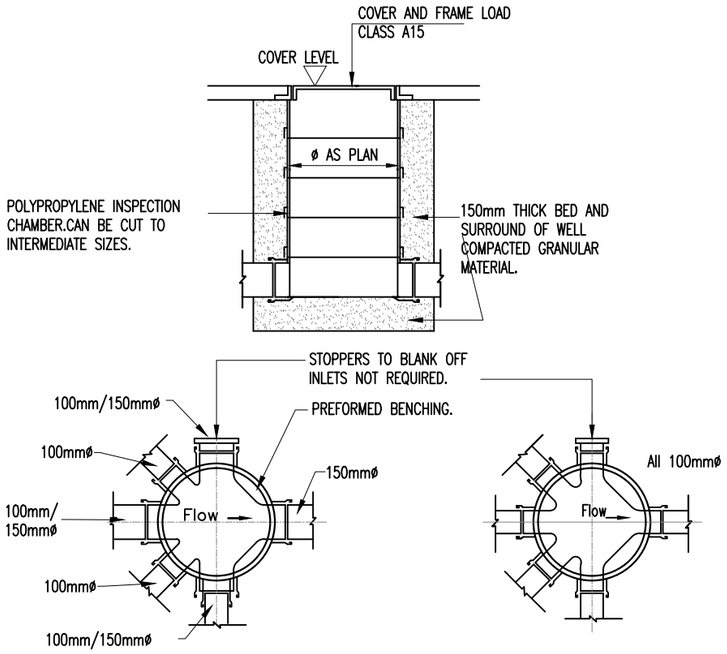


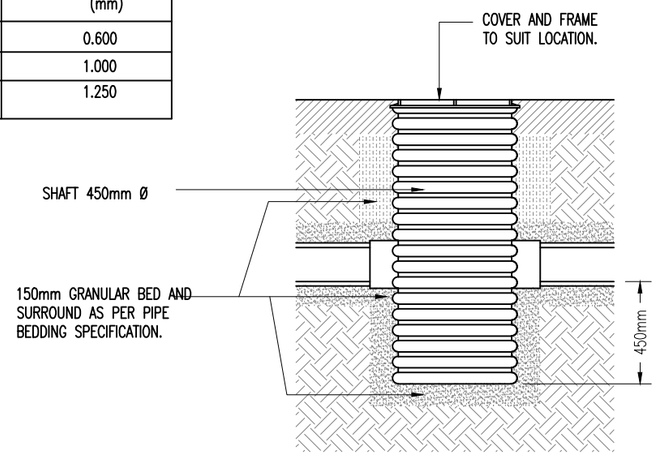
TABLE BASED ON WAVIN INSPECTION CHAMBERS

BASE TYPE	SIC	RANGE 315	RANGE 450	RANGE 600
Max Invert depth (m)	0.6	0.6–2.0	1.2–3.0	1.2–3.0
Base / Shaft dia(mm)	250	315	450	600
No of inlets 1	N	Y	Y	Y
1 to 3	Y	Y	Y	Y
4 to 5	N	N	Y	N
Inlet sizes ID (mm)	100	100	100/150	150/225/300

ROCKER PIPES

Nominal Diameter (mm)	Effective Length (mm)
150–600	0.600
675–750	1.000
over 750	1.250

SILT TRAP

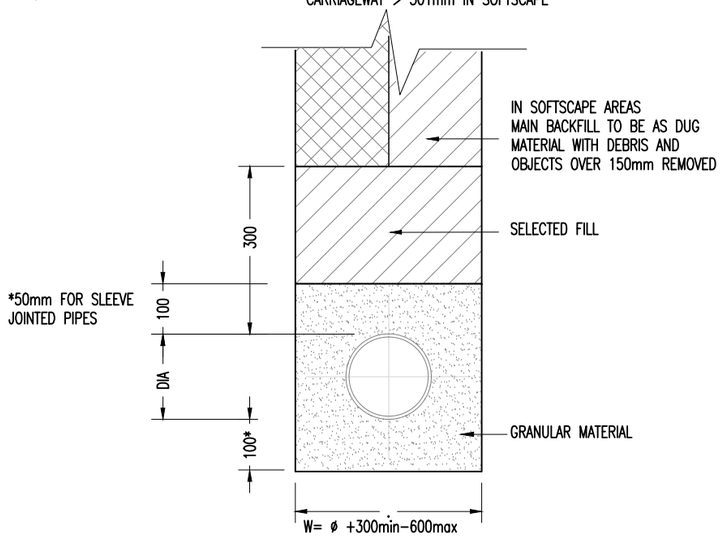


NOTE

PRIVATE DRAINAGE TO BE CONSTRUCTED IN ACCORDANCE WITH THE BUILDING REGULATIONS "APPROVED DOCUMENT H".

CLASS S

TO BE USED WHEN COVER IS > 1.2m IN CARRIAGEWAY > 501mm IN SOFTSCAPE



SELECTED FILL — FREE FROM STONES LARGER THAN 40mm, LUMPS OF CLAY OVER 100mm, TIMBER, FROZEN MATERIAL, VEGETABLE MATTER.

GRANULAR MATERIAL — MATERIAL SHOULD CONFORM TO BS EN 1610 AND SHOULD BE SINGLE SIZE GRADED
MATERIAL DN100 AND DN 150: SIZE 4/10.
DN225 AND DN 300: SIZE4/10,10/20 OR 4/20
DN 375 AND DN 500 SIZE 10/20 OR 4/20
DN 600 AND ABOVE: SIZE 10/20, 20/40, 4/20 OR 4/40

NOTES: (CLASS S & CLASS Z)

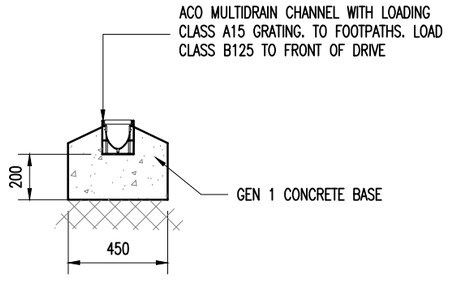
1. BEDDING BENEATH AND AT SIDES OF THE PIPE TO BE WELL COMPACTED.
2. WHERE A CONCRETE CRADLE IS PROVIDED, THE FIRST 300mm OF FILL ABOVE THE CROWN OF THE PIPE IS TO BE LIGHTLY COMPACTED BY HAND. MECHANICAL COMPACTION MAY BE USED ONLY ABOVE THIS LEVEL.
3. CONCRETE CRADLES AND ARCHES MAY BE EXTENDED TO THE SIDES OF THE TRENCH.
4. GEOTEXTILES MAY BE USED WHERE DIRECTED OR APPROVED BY THE ENGINEER TO CONTAIN BEDDING MATERIAL IN CERTAIN SOILS EG. RUNNING SAND.
5. IN VERY WET CONDITIONS, WHERE DIRECTED OR APPROVED BY THE ENGINEER A TEMPORARY LAND DRAIN MAY BE LAID WITHIN THE GRANULAR BED.

NOTES: (CLASS Z ONLY)

6. WHERE PIPES WITH FLEXIBLE JOINTS ARE USED THE CONCRETE PROTECTION SHALL BE INTERRUPTED OVER ITS FULL CROSS–SECTION AT EACH JOINT BY A SHAPED 18mm COMPRESSIBLE FILLER. IF PIPES ARE SURROUNDED IN CONCRETE THE JOINTS SHALL BE PROTECTED FROM THE INGRESS OF CONCRETE BY WRAPPING THEM WITH TWO COATS OF MASTIC BANDAGE TAPE.
7. CONCRETE TO BE GEN 1
8. WHERE FLEXIBLE PIPES ARE USED. CARE MUST BE TAKEN TO PREVENT THE PIPES FROM FLOATING.

LINE DRAIN TO FOOTPATHS

1. DRAINAGE CHANNELS TO BE ACO MULTIDRAIN M100PPD AS SUPPLIED BY ACO POLYMER PRODUCTS LTD, ACCORDANCE WITH MANUFACTURERS INSTRUCTIONS
2. GRATINGS TO BE HEEL GUARD LOAD CLASS A15
3. FOUNDATION FOR CHANNELS TO BE LAID ON A ROLLED SUB–BASE OF 100mm MINIMUM THICKNESS.



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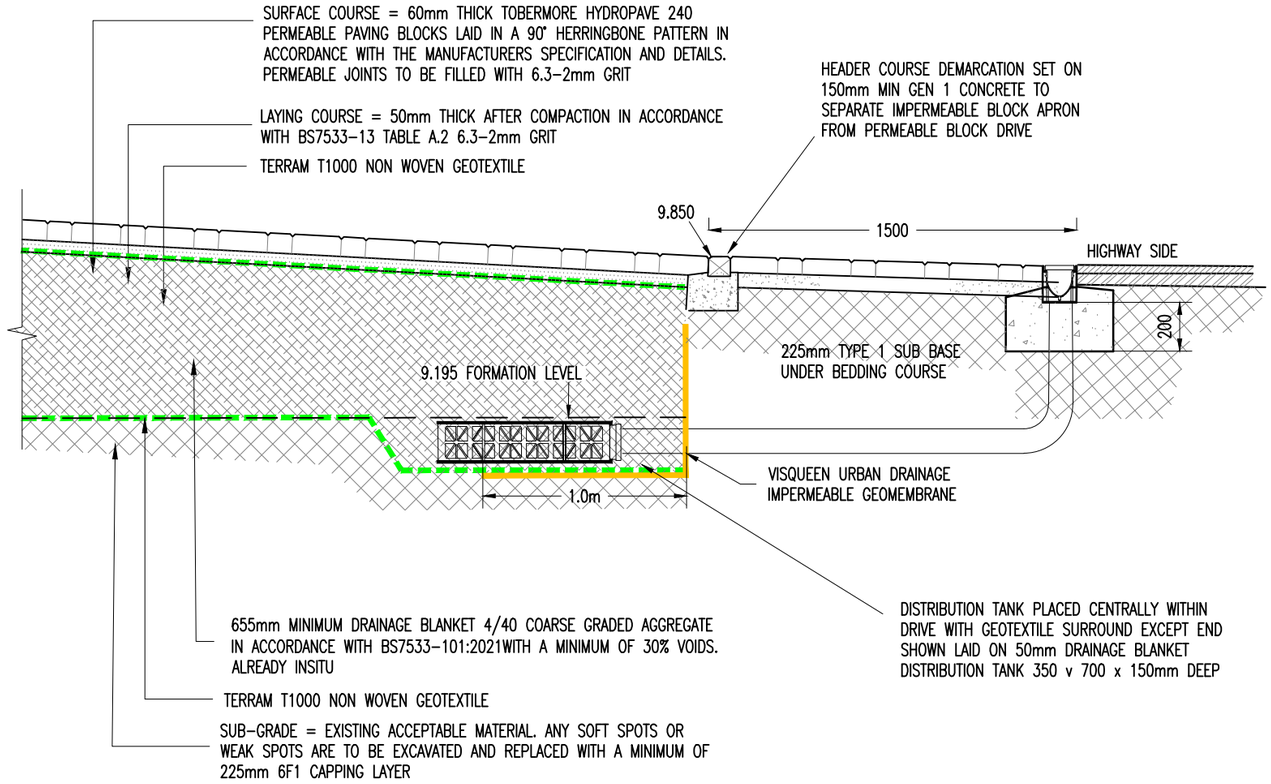
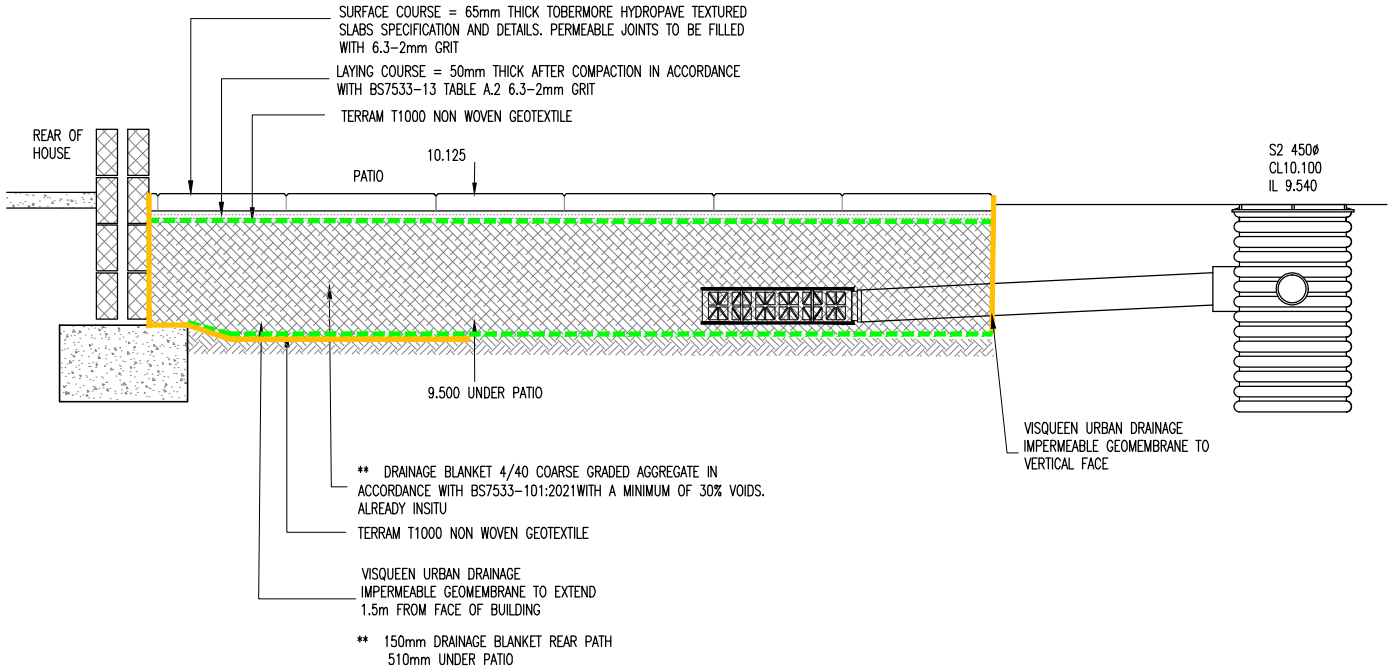
Project.	Drawing	Status			
PROPOSED PLOTS ADJACENT 63 BRECON RISE, PANT, MERTHYR TYDFIL CF48 2EE	CONSTRUCTION DETAILS	APPROVAL		Scales:	1:25 @A3
				Date:	AUGUST 2026
				Drawing Number:	03

SECTION THROUGH PERMEABLE BLOCK PAVED DRIVE WITH SUMP TO LINE DRAIN DISTRIBUTION UNIT



Project.	Drawing	Status		Scales:	1:25 @A3
PROPOSED PLOTS ADJACENT 63 BRECON RISE, PANT, MERTHYR TYDFIL CF48 2EE	CONSTRUCTION DETAILS	APPROVAL		Date:	AUGUST 2026
				Drawing Number:	04

SECTION THROUGH PERMEABLE BLOCK PATIO AND SIDE PATH



Project.	Drawing	Status		Scales:	1:25 @A3
PROPOSED PLOTS ADJACENT 63 BRECON RISE, PANT, MERTHYR TYDFIL CF48 2EE	CONSTRUCTION DETAILS	APPROVAL		Date:	AUGUST 2026
				Drawing Number:	05

Soakaway Calculations

- Plot adjacent 63 Brecon Rise, Merthyr Tydfil CBC
- August 2026,
- Surface water drainage calculations:

1. FEH 2022 Catchment data used for calculations.
2. Calculations provided for:
    a. Network 1: 1:2+40%, 1:30+40% 1:100 +40%, Permeable patio and part roof
    b. Network 2: 1:2+40%, 1:30+40% 1:100 +40%, Permeable drive and part roof
3. CV Winter and Summer set to 1.0

Roof and patio 2+40%ccf	Plot adjacent 63 Brecon Rise MTCBC
Date 21/08/2026 13:05 File Network 1.MDX	Designed by rnelson Checked by RF
Micro Drainage	Network 2020.1.3

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FEH Rainfall Model

Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 306666 209180 So 06666 09180
Data Type	Point
Maximum Rainfall (mm/hr)	150
Maximum Time of Concentration (mins)	30
Foul Sewage (l/s/ha)	0.000
Volumetric Runoff Coeff.	1.000
PIMP (%)	100
Add Flow / Climate Change (%)	0
Minimum Backdrop Height (m)	0.200
Maximum Backdrop Height (m)	1.500
Min Design Depth for Optimisation (m)	1.200
Min Vel for Auto Design only (m/s)	1.00
Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S1.000	4.229	0.100	42.3	0.001	5.00	0.0	0.600	o	100	Pipe/Conduit	
S1.001	3.922	0.020	196.1	0.004	0.00	0.0	0.600	o	100	Pipe/Conduit	
S1.002	2.000	0.020	100.0	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit	
S1.003	2.000	0.020	100.0	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S1.000	137.60	5.06	9.640	0.001	0.0	0.0	0.0	1.19	9.3	0.5
S1.001	136.69	5.18	9.540	0.005	0.0	0.0	0.0	0.55	4.3	2.5
S1.002	136.37	5.22	9.520	0.005	0.0	0.0	0.0	0.77	6.0	2.5
S1.003	136.05	5.27	9.500	0.005	0.0	0.0	0.0	0.77	6.0	2.5

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Roof and patio 2+40%ccf	Plot adjacent 63 Brecon Rise MTCBC
Date 21/08/2026 13:05 File Network 1.MDX	Designed by rnelson Checked by RF
Micro Drainage	Network 2020.1.3

Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
S1	10.100	0.460	Open Manhole	450	S1.000	9.640	100				
S2	10.100	0.560	Open Manhole	1200	S1.001	9.540	100	S1.000	9.540	100	
Sdum2	10.100	0.580	Open Manhole	450	S1.002	9.520	100	S1.001	9.520	100	
S3	10.100	0.600	Open Manhole	450	S1.003	9.500	100	S1.002	9.500	100	
Sdums5	10.100	0.620	Open Manhole	450		OUTFALL		S1.003	9.480	100	

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S1	311670.277	206535.610	311670.277	206535.610	Required	
S2	311672.212	206539.370	311672.212	206539.370	Required	
Sdum2	311668.291	206539.424	311668.291	206539.424	Required	
S3	311666.292	206539.467	311666.292	206539.467	Required	
Sdums5	311664.292	206539.504			No Entry	

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Roof and patio 2+40%ccf	Plot adjacent 63 Brecon Rise MTCBC
Date 21/08/2026 13:05 File Network 1.MDX	Designed by rnelson Checked by RF
Micro Drainage	Network 2020.1.3

Area Summary for Storm

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	-	-	100	0.001	0.001	0.001
1.001	-	-	100	0.004	0.004	0.004
1.002	-	-	100	0.000	0.000	0.000
1.003	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				0.005	0.005	0.005

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
S1.003	Sdums5	10.100	9.480	0.000	450	0

Simulation Criteria for Storm

Volumetric Runoff Coeff	1.000	Additional Flow - % of Total Flow	11.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Inlet Coeffiecient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1

Number of Input Hydrographs	0	Number of Offline Controls	0	Number of Time/Area Diagrams	0
Number of Online Controls	1	Number of Storage Structures	1	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 306666 209180 So 06666 09180
Data Type	Point
Summer Storms	No
Winter Storms	Yes
Cv (Summer)	1.000
Cv (Winter)	1.000
Storm Duration (mins)	30

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Online Controls for Storm

Pump Manhole: S3, DS/PN: S1.003, Volume (m³): 0.1

Invert Level (m) 9.500

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Roof and patio 2+40%ccf	Plot adjacent 63 Brecon Rise MTCBC
Date 21/08/2026 13:05 File Network 1.MDX	Designed by rnelson Checked by RF
Micro Drainage	Network 2020.1.3

Storage Structures for Storm

Porous Car Park Manhole: Sdum2, DS/PN: S1.002

Infiltration Coefficient Base (m/hr)	0.06230	Width (m)	4.0
Membrane Percolation (mm/hr)	3000	Length (m)	4.0
Max Percolation (l/s)	13.3	Slope (1:X)	0.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	9.500	Membrane Depth (mm)	0

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Roof and patio 2+40%ccf	Plot adjacent 63 Brecon Rise MTCBC
Date 21/08/2026 13:05 File Network 1.MDX	Designed by rnelson Checked by RF
Micro Drainage	Network 2020.1.3

Summary of Critical Results by Half Drain Time (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	11.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 1 Number of Storage Structures 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FEH
FEH Rainfall Version	2013
Site Location GB 306666 209180 So 06666 09180	
Data Type	Point
Cv (Summer)	1.000
Cv (Winter)	1.000

Margin for Flood Risk Warning (mm)	100.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	OFF
DVD Status	OFF
Inertia Status	OFF

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440
Return Period(s) (years)	2
Climate Change (%)	40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
S1.000	S1	1440 Winter	2	+40%					9.641
S1.001	S2	1440 Winter	2	+40%	2/120 Summer				9.553
S1.002	Sdum2	1440 Winter	2	+40%	2/60 Summer				9.544
S1.003	S3	1440 Winter	2	+40%	2/30 Summer				9.544

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	S1	-0.099	0.000	0.00			0.0	OK	
S1.001	S2	-0.087	0.000	0.03			0.1	OK	

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Roof and patio 2+40%ccf	Plot adjacent 63 Brecon Rise MTCBC
Date 21/08/2026 13:05 File Network 1.MDX	Designed by rnelson Checked by RF
Micro Drainage	Network 2020.1.3

Summary of Critical Results by Half Drain Time (Rank 1) for Storm

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S1.002	Sdum2	-0.076	0.000	0.00		238	0.0	OK	
S1.003	S3	-0.056	0.000	0.00			0.0	OK	

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Roof and patio 30+40%ccf	Plot adjacent 63 Brecon Rise MTCBC
Date 21/08/2026 13:04 File Network 1.MDX	Designed by rnelson Checked by RF
Micro Drainage	Network 2020.1.3

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FEH Rainfall Model

Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 306666 209180 So 06666 09180
Data Type	Point
Maximum Rainfall (mm/hr)	150
Maximum Time of Concentration (mins)	30
Foul Sewage (l/s/ha)	0.000
Volumetric Runoff Coeff.	1.000
PIMP (%)	100
Add Flow / Climate Change (%)	0
Minimum Backdrop Height (m)	0.200
Maximum Backdrop Height (m)	1.500
Min Design Depth for Optimisation (m)	1.200
Min Vel for Auto Design only (m/s)	1.00
Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S1.000	4.229	0.100	42.3	0.001	5.00	0.0	0.600	o	100	Pipe/Conduit	
S1.001	3.922	0.020	196.1	0.004	0.00	0.0	0.600	o	100	Pipe/Conduit	
S1.002	2.000	0.020	100.0	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit	
S1.003	2.000	0.020	100.0	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S1.000	137.60	5.06	9.640	0.001	0.0	0.0	0.0	1.19	9.3	0.5
S1.001	136.69	5.18	9.540	0.005	0.0	0.0	0.0	0.55	4.3	2.5
S1.002	136.37	5.22	9.520	0.005	0.0	0.0	0.0	0.77	6.0	2.5
S1.003	136.05	5.27	9.500	0.005	0.0	0.0	0.0	0.77	6.0	2.5

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Roof and patio 30+40%ccf	Plot adjacent 63 Brecon Rise MTCBC
Date 21/08/2026 13:04 File Network 1.MDX	Designed by rnelson Checked by RF
Micro Drainage	Network 2020.1.3

Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
S1	10.100	0.460	Open Manhole	450	S1.000	9.640	100				
S2	10.100	0.560	Open Manhole	1200	S1.001	9.540	100	S1.000	9.540	100	
Sdum2	10.100	0.580	Open Manhole	450	S1.002	9.520	100	S1.001	9.520	100	
S3	10.100	0.600	Open Manhole	450	S1.003	9.500	100	S1.002	9.500	100	
Sdums5	10.100	0.620	Open Manhole	450		OUTFALL		S1.003	9.480	100	

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S1	311670.277	206535.610	311670.277	206535.610	Required	
S2	311672.212	206539.370	311672.212	206539.370	Required	
Sdum2	311668.291	206539.424	311668.291	206539.424	Required	
S3	311666.292	206539.467	311666.292	206539.467	Required	
Sdums5	311664.292	206539.504			No Entry	

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Roof and patio 30+40%ccf	Plot adjacent 63 Brecon Rise MTCBC
Date 21/08/2026 13:04 File Network 1.MDX	Designed by rnelson Checked by RF
Micro Drainage	Network 2020.1.3

Area Summary for Storm

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	-	-	100	0.001	0.001	0.001
1.001	-	-	100	0.004	0.004	0.004
1.002	-	-	100	0.000	0.000	0.000
1.003	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				0.005	0.005	0.005

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
S1.003	Sdums5	10.100	9.480	0.000	450	0

Simulation Criteria for Storm

Volumetric Runoff Coeff	1.000	Additional Flow - % of Total Flow	11.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Inlet Coeffiecient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1

Number of Input Hydrographs	0	Number of Offline Controls	0	Number of Time/Area Diagrams	0
Number of Online Controls	1	Number of Storage Structures	1	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 306666 209180 So 06666 09180
Data Type	Point
Summer Storms	No
Winter Storms	Yes
Cv (Summer)	1.000
Cv (Winter)	1.000
Storm Duration (mins)	30

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Roof and patio 30+40%ccf	Plot adjacent 63 Brecon Rise MTCBC
Date 21/08/2026 13:04 File Network 1.MDX	Designed by rnelson Checked by RF
Micro Drainage	Network 2020.1.3

Online Controls for Storm

Pump Manhole: S3, DS/PN: S1.003, Volume (m³): 0.1

Invert Level (m) 9.500

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Roof and patio 30+40%ccf	Plot adjacent 63 Brecon Rise MTCBC	
Date 21/08/2026 13:04 File Network 1.MDX	Designed by rnelson Checked by RF	
Micro Drainage	Network 2020.1.3	

Storage Structures for Storm

Porous Car Park Manhole: Sdum2, DS/PN: S1.002

Infiltration Coefficient Base (m/hr)	0.06230	Width (m)	4.0
Membrane Percolation (mm/hr)	3000	Length (m)	4.0
Max Percolation (l/s)	13.3	Slope (1:X)	0.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	9.500	Membrane Depth (mm)	0

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Roof and patio 30+40%ccf	Plot adjacent 63 Brecon Rise MTCBC
Date 21/08/2026 13:04 File Network 1.MDX	Designed by rnelson Checked by RF
Micro Drainage	Network 2020.1.3

Summary of Critical Results by Half Drain Time (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	11.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 1 Number of Storage Structures 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FEH
FEH Rainfall Version	2013
Site Location GB 306666 209180 So 06666 09180	
Data Type	Point
Cv (Summer)	1.000
Cv (Winter)	1.000

Margin for Flood Risk Warning (mm)	100.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	OFF
DVD Status	OFF
Inertia Status	OFF

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440
Return Period(s) (years)	30
Climate Change (%)	40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
S1.000	S1	480 Summer	30	+40%	30/30 Summer				9.854
S1.001	S2	600 Summer	30	+40%	30/15 Summer				9.839
S1.002	Sdum2	720 Summer	30	+40%	30/15 Summer				9.823
S1.003	S3	720 Summer	30	+40%	30/15 Summer				9.851

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	S1	0.114	0.000	0.01			0.1	SURCHARGED	
S1.001	S2	0.199	0.000	0.13			0.5	SURCHARGED	

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Roof and patio 30+40%ccf	Plot adjacent 63 Brecon Rise MTCBC
Date 21/08/2026 13:04 File Network 1.MDX	Designed by rnelson Checked by RF
Micro Drainage	Network 2020.1.3

Summary of Critical Results by Half Drain Time (Rank 1) for Storm

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S1.002	Sdum2	0.203	0.000	0.03		253	0.1	SURCHARGED	
S1.003	S3	0.251	0.000	0.00			0.0	SURCHARGED	

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Roof and patio 100+40%ccf	Plot adjacent 63 Brecon Rise MTCBC
Date 21/08/2026 13:03 File Network 1.MDX	Designed by rnelson Checked by RF
Micro Drainage	Network 2020.1.3

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FEH Rainfall Model

Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 306666 209180 So 06666 09180
Data Type	Point
Maximum Rainfall (mm/hr)	150
Maximum Time of Concentration (mins)	30
Foul Sewage (l/s/ha)	0.000
Volumetric Runoff Coeff.	1.000
PIMP (%)	100
Add Flow / Climate Change (%)	0
Minimum Backdrop Height (m)	0.200
Maximum Backdrop Height (m)	1.500
Min Design Depth for Optimisation (m)	1.200
Min Vel for Auto Design only (m/s)	1.00
Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S1.000	4.229	0.100	42.3	0.001	5.00	0.0	0.600	o	100	Pipe/Conduit	
S1.001	3.922	0.020	196.1	0.004	0.00	0.0	0.600	o	100	Pipe/Conduit	
S1.002	2.000	0.020	100.0	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit	
S1.003	2.000	0.020	100.0	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S1.000	137.60	5.06	9.640	0.001	0.0	0.0	0.0	1.19	9.3	0.5
S1.001	136.69	5.18	9.540	0.005	0.0	0.0	0.0	0.55	4.3	2.5
S1.002	136.37	5.22	9.520	0.005	0.0	0.0	0.0	0.77	6.0	2.5
S1.003	136.05	5.27	9.500	0.005	0.0	0.0	0.0	0.77	6.0	2.5

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Roof and patio 100+40%ccf	Plot adjacent 63 Brecon Rise MTCBC
Date 21/08/2026 13:03 File Network 1.MDX	Designed by rnelson Checked by RF
Micro Drainage	Network 2020.1.3

Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
S1	10.100	0.460	Open Manhole	450	S1.000	9.640	100				
S2	10.100	0.560	Open Manhole	1200	S1.001	9.540	100	S1.000	9.540	100	
Sdum2	10.100	0.580	Open Manhole	450	S1.002	9.520	100	S1.001	9.520	100	
S3	10.100	0.600	Open Manhole	450	S1.003	9.500	100	S1.002	9.500	100	
Sdums5	10.100	0.620	Open Manhole	450		OUTFALL		S1.003	9.480	100	

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S1	311670.277	206535.610	311670.277	206535.610	Required	
S2	311672.212	206539.370	311672.212	206539.370	Required	
Sdum2	311668.291	206539.424	311668.291	206539.424	Required	
S3	311666.292	206539.467	311666.292	206539.467	Required	
Sdums5	311664.292	206539.504			No Entry	

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Roof and patio 100+40%ccf	Plot adjacent 63 Brecon Rise MTCBC
Date 21/08/2026 13:03 File Network 1.MDX	Designed by rnelson Checked by RF
Micro Drainage	Network 2020.1.3

Area Summary for Storm

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	-	-	100	0.001	0.001	0.001
1.001	-	-	100	0.004	0.004	0.004
1.002	-	-	100	0.000	0.000	0.000
1.003	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				0.005	0.005	0.005

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
S1.003	Sdums5	10.100	9.480	0.000	450	0

Simulation Criteria for Storm

Volumetric Runoff Coeff	1.000	Additional Flow - % of Total Flow	11.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Inlet Coeffiecient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1

Number of Input Hydrographs	0	Number of Offline Controls	0	Number of Time/Area Diagrams	0
Number of Online Controls	1	Number of Storage Structures	1	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 306666 209180 So 06666 09180
Data Type	Point
Summer Storms	No
Winter Storms	Yes
Cv (Summer)	1.000
Cv (Winter)	1.000
Storm Duration (mins)	30

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Online Controls for Storm

Pump Manhole: S3, DS/PN: S1.003, Volume (m³): 0.1

Invert Level (m) 9.500

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Roof and patio 100+40%ccf	Plot adjacent 63 Brecon Rise MTCBC	
Date 21/08/2026 13:03 File Network 1.MDX	Designed by rnelson Checked by RF	
Micro Drainage	Network 2020.1.3	

Storage Structures for Storm

Porous Car Park Manhole: Sdum2, DS/PN: S1.002

Infiltration Coefficient Base (m/hr)	0.06230	Width (m)	4.0
Membrane Percolation (mm/hr)	3000	Length (m)	4.0
Max Percolation (l/s)	13.3	Slope (1:X)	0.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	9.500	Membrane Depth (mm)	0

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Roof and patio 100+40%ccf	Plot adjacent 63 Brecon Rise MTCBC
Date 21/08/2026 13:03 File Network 1.MDX	Designed by rnelson Checked by RF
Micro Drainage	Network 2020.1.3

Summary of Critical Results by Half Drain Time (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	11.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 1 Number of Storage Structures 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FEH
FEH Rainfall Version	2013
Site Location GB 306666 209180 So 06666 09180	
Data Type	Point
Cv (Summer)	1.000
Cv (Winter)	1.000

Margin for Flood Risk Warning (mm)	100.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	OFF
DVD Status	OFF
Inertia Status	OFF

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440
Return Period(s) (years)	100
Climate Change (%)	40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
S1.000	S1	720 Summer	100	+40%	100/15 Summer				9.942
S1.001	S2	720 Summer	100	+40%	100/15 Summer				9.942
S1.002	Sdum2	720 Summer	100	+40%	100/15 Summer				9.943
S1.003	S3	960 Summer	100	+40%	100/15 Summer				9.933

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	S1	0.202	0.000	0.01			0.1	SURCHARGED	
S1.001	S2	0.302	0.000	0.14			0.5	SURCHARGED	

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Roof and patio 100+40%ccf	Plot adjacent 63 Brecon Rise MTCBC
Date 21/08/2026 13:03 File Network 1.MDX	Designed by rnelson Checked by RF
Micro Drainage	Network 2020.1.3

Summary of Critical Results by Half Drain Time (Rank 1) for Storm

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S1.002	Sdum2	0.323	0.000	0.03		315	0.1	SURCHARGED	
S1.003	S3	0.333	0.000	0.00			0.0	SURCHARGED	

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Roof and drive 2+40%ccf	Plot adjacent 63 Brecon Rise MTCBC
Date 21/08/2026 12:44 File Network 2-.MDX	Designed by rnelson Checked by RF
Micro Drainage	Network 2020.1.3

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FEH Rainfall Model

Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 306666 209180 So 06666 09180
Data Type	Point
Maximum Rainfall (mm/hr)	150
Maximum Time of Concentration (mins)	30
Foul Sewage (l/s/ha)	0.000
Volumetric Runoff Coeff.	1.000
PIMP (%)	100
Add Flow / Climate Change (%)	0
Minimum Backdrop Height (m)	0.200
Maximum Backdrop Height (m)	1.500
Min Design Depth for Optimisation (m)	1.200
Min Vel for Auto Design only (m/s)	1.00
Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S1.000	11.438	0.055	208.0	0.003	5.00	0.0	0.600	o	100	Pipe/Conduit	
S1.001	1.895	0.020	94.8	0.002	0.00	0.0	0.600	o	100	Pipe/Conduit	
S1.002	2.000	0.020	100.0	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S1.000	135.36	5.36	9.250	0.003	0.0	0.0	0.0	0.53	4.2	1.5
S1.001	135.08	5.40	9.195	0.005	0.0	0.0	0.0	0.79	6.2	2.4
S1.002	134.76	5.44	9.175	0.005	0.0	0.0	0.0	0.77	6.0	2.4

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Roof and drive 2+40%ccf	Plot adjacent 63 Brecon Rise MTCBC
Date 21/08/2026 12:44 File Network 2-.MDX	Designed by rnelson Checked by RF
Micro Drainage	Network 2020.1.3

Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
Sdum1	10.100	0.850	Open Manhole	450	S1.000	9.250	100				
Sdum2	10.100	0.905	Open Manhole	450	S1.001	9.195	100	S1.000	9.195	100	
Sdum3	9.850	0.675	Open Manhole	450	S1.002	9.175	100	S1.001	9.175	100	
Sdums4	10.100	0.945	Open Manhole	450		OUTFALL		S1.002	9.155	100	

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
Sdum1	311658.633	206540.391	311658.633	206540.391	Required	
Sdum2	311649.220	206546.888	311649.220	206546.888	Required	
Sdum3	311647.905	206548.253	311647.905	206548.253	Required	
Sdums4	311646.441	206549.616			No Entry	

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Roof and drive 2+40%ccf	Plot adjacent 63 Brecon Rise MTCBC
Date 21/08/2026 12:44 File Network 2-.MDX	Designed by rnelson Checked by RF
Micro Drainage	Network 2020.1.3

Area Summary for Storm

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	-	-	100	0.003	0.003	0.003
1.001	-	-	100	0.002	0.002	0.002
1.002	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				0.005	0.005	0.005

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
S1.002	Sdums4	10.100	9.155	0.000	450	0

Simulation Criteria for Storm

Volumetric Runoff Coeff	1.000	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Inlet Coeffiecient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1

Number of Input Hydrographs	0	Number of Offline Controls	0	Number of Time/Area Diagrams	0
Number of Online Controls	1	Number of Storage Structures	1	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 306666 209180 So 06666 09180
Data Type	Point
Summer Storms	No
Winter Storms	Yes
Cv (Summer)	1.000
Cv (Winter)	1.000
Storm Duration (mins)	30

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Roof and drive 2+40%ccf	Plot adjacent 63 Brecon Rise MTCBC
Date 21/08/2026 12:44 File Network 2-.MDX	Designed by rnelson Checked by RF
Micro Drainage	Network 2020.1.3

Online Controls for Storm

Pump Manhole: Sdum3, DS/PN: S1.002, Volume (m^3): 0.1

Invert Level (m) 9.175

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Roof and drive 2+40%ccf	Plot adjacent 63 Brecon Rise MTCBC
Date 21/08/2026 12:44 File Network 2-.MDX	Designed by rnelson Checked by RF
Micro Drainage	Network 2020.1.3

Storage Structures for Storm

Porous Car Park Manhole: Sdum2, DS/PN: S1.001

Infiltration Coefficient Base (m/hr)	0.00700	Width (m)	2.6
Membrane Percolation (mm/hr)	3000	Length (m)	10.6
Max Percolation (l/s)	23.0	Slope (1:X)	0.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	9.195	Membrane Depth (mm)	0

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Roof and drive 2+40%ccf	Plot adjacent 63 Brecon Rise MTCBC
Date 21/08/2026 12:44 File Network 2-.MDX	Designed by rnelson Checked by RF
Micro Drainage	Network 2020.1.3

Summary of Critical Results by Half Drain Time (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
Hot Start Level (mm) 0 Inlet Coeffiecient 0.800
Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 1 Number of Storage Structures 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FEH
FEH Rainfall Version 2013
Site Location GB 306666 209180 So 06666 09180
Data Type Point
Cv (Summer) 1.000
Cv (Winter) 1.000

Margin for Flood Risk Warning (mm) 100.0
Analysis Timestep 2.5 Second Increment (Extended)
DTS Status ON
DVD Status ON
Inertia Status OFF

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440
Return Period(s) (years) 2
Climate Change (%) 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
S1.000	Sdum1	1440 Summer	2	+40%	2/180 Summer				9.435
S1.001	Sdum2	1440 Summer	2	+40%	2/120 Summer				9.436
S1.002	Sdum3	1440 Summer	2	+40%	2/30 Summer				9.471

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	Sdum1	0.085	0.000	0.03			0.1	SURCHARGED	
S1.001	Sdum2	0.141	0.000	0.06		969	0.2	SURCHARGED	
S1.002	Sdum3	0.196	0.000	0.00			0.0	SURCHARGED	

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Roof and drive 30+40%ccf	Plot adjacent 63 Brecon Rise MTCBC
Date 21/08/2026 12:43 File Network 2-.MDX	Designed by rnelson Checked by RF
Micro Drainage	Network 2020.1.3

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FEH Rainfall Model	
Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 306666 209180 So 06666 09180
Data Type	Point
Maximum Rainfall (mm/hr)	150
Maximum Time of Concentration (mins)	30
Foul Sewage (l/s/ha)	0.000
Volumetric Runoff Coeff.	1.000
PIMP (%)	100
Add Flow / Climate Change (%)	0
Minimum Backdrop Height (m)	0.200
Maximum Backdrop Height (m)	1.500
Min Design Depth for Optimisation (m)	1.200
Min Vel for Auto Design only (m/s)	1.00
Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S1.000	11.438	0.055	208.0	0.003	5.00	0.0	0.600	o	100	Pipe/Conduit	
S1.001	1.895	0.020	94.8	0.002	0.00	0.0	0.600	o	100	Pipe/Conduit	
S1.002	2.000	0.020	100.0	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S1.000	135.36	5.36	9.250	0.003	0.0	0.0	0.0	0.53	4.2	1.5
S1.001	135.08	5.40	9.195	0.005	0.0	0.0	0.0	0.79	6.2	2.4
S1.002	134.76	5.44	9.175	0.005	0.0	0.0	0.0	0.77	6.0	2.4

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Roof and drive 30+40%ccf	Plot adjacent 63 Brecon Rise MTCBC
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Micro Drainage	Network 2020.1.3

Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
Sdum1	10.100	0.850	Open Manhole	450	S1.000	9.250	100				
Sdum2	10.100	0.905	Open Manhole	450	S1.001	9.195	100	S1.000	9.195	100	
Sdum3	9.850	0.675	Open Manhole	450	S1.002	9.175	100	S1.001	9.175	100	
Sdums4	10.100	0.945	Open Manhole	450		OUTFALL		S1.002	9.155	100	

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
Sdum1	311658.633	206540.391	311658.633	206540.391	Required	
Sdum2	311649.220	206546.888	311649.220	206546.888	Required	
Sdum3	311647.905	206548.253	311647.905	206548.253	Required	
Sdums4	311646.441	206549.616			No Entry	

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Roof and drive 30+40%ccf	Plot adjacent 63 Brecon Rise MTCBC
Date 21/08/2026 12:43 File Network 2-.MDX	Designed by rnelson Checked by RF
Micro Drainage	Network 2020.1.3

Area Summary for Storm

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	-	-	100	0.003	0.003	0.003
1.001	-	-	100	0.002	0.002	0.002
1.002	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				0.005	0.005	0.005

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
S1.002	Sdums4	10.100	9.155	0.000	450	0

Simulation Criteria for Storm

Volumetric Runoff Coeff	1.000	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Inlet Coeffiecient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1

Number of Input Hydrographs	0	Number of Offline Controls	0	Number of Time/Area Diagrams	0
Number of Online Controls	1	Number of Storage Structures	1	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 306666 209180 So 06666 09180
Data Type	Point
Summer Storms	No
Winter Storms	Yes
Cv (Summer)	1.000
Cv (Winter)	1.000
Storm Duration (mins)	30

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Online Controls for Storm

Pump Manhole: Sdum3, DS/PN: S1.002, Volume (m³): 0.1

Invert Level (m) 9.175

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Roof and drive 30+40%ccf	Plot adjacent 63 Brecon Rise MTCBC
Date 21/08/2026 12:43 File Network 2-.MDX	Designed by rnelson Checked by RF
Micro Drainage	Network 2020.1.3

Storage Structures for Storm

Porous Car Park Manhole: Sdum2, DS/PN: S1.001

Infiltration Coefficient Base (m/hr)	0.00700	Width (m)	2.6
Membrane Percolation (mm/hr)	3000	Length (m)	10.6
Max Percolation (l/s)	23.0	Slope (1:X)	0.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	9.195	Membrane Depth (mm)	0

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Roof and drive 30+40%ccf	Plot adjacent 63 Brecon Rise MTCBC
Date 21/08/2026 12:43 File Network 2-.MDX	Designed by rnelson Checked by RF
Micro Drainage	Network 2020.1.3

Summary of Critical Results by Half Drain Time (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
Hot Start Level (mm) 0 Inlet Coeffiecient 0.800
Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 1 Number of Storage Structures 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FEH
FEH Rainfall Version 2013
Site Location GB 306666 209180 So 06666 09180
Data Type Point
Cv (Summer) 1.000
Cv (Winter) 1.000

Margin for Flood Risk Warning (mm) 100.0
Analysis Timestep 2.5 Second Increment (Extended)
DTS Status ON
DVD Status ON
Inertia Status OFF

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440
Return Period(s) (years) 30
Climate Change (%) 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
S1.000	Sdum1	1440 Summer	30	+40%	30/30 Summer				9.640
S1.001	Sdum2	1440 Summer	30	+40%	30/15 Summer				9.641
S1.002	Sdum3	1440 Summer	30	+40%	30/15 Summer				9.675

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	Sdum1	0.290	0.000	0.04			0.2	SURCHARGED	
S1.001	Sdum2	0.346	0.000	0.05		1383	0.2	SURCHARGED	
S1.002	Sdum3	0.400	0.000	0.00			0.0	SURCHARGED	

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Roof and drive 100+40%ccf	Plot adjacent 63 Brecon Rise MTCBC
Date 21/08/2026 12:42 File Network 2-.MDX	Designed by rnelson Checked by RF
Micro Drainage	Network 2020.1.3

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FEH Rainfall Model	
Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 306666 209180 So 06666 09180
Data Type	Point
Maximum Rainfall (mm/hr)	150
Maximum Time of Concentration (mins)	30
Foul Sewage (l/s/ha)	0.000
Volumetric Runoff Coeff.	1.000
PIMP (%)	100
Add Flow / Climate Change (%)	0
Minimum Backdrop Height (m)	0.200
Maximum Backdrop Height (m)	1.500
Min Design Depth for Optimisation (m)	1.200
Min Vel for Auto Design only (m/s)	1.00
Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S1.000	11.438	0.055	208.0	0.003	5.00	0.0	0.600	o	100	Pipe/Conduit	
S1.001	1.895	0.020	94.8	0.002	0.00	0.0	0.600	o	100	Pipe/Conduit	
S1.002	2.000	0.020	100.0	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S1.000	135.36	5.36	9.250	0.003	0.0	0.0	0.0	0.53	4.2	1.5
S1.001	135.08	5.40	9.195	0.005	0.0	0.0	0.0	0.79	6.2	2.4
S1.002	134.76	5.44	9.175	0.005	0.0	0.0	0.0	0.77	6.0	2.4

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Roof and drive 100+40%ccf	Plot adjacent 63 Brecon Rise MTCBC
Date 21/08/2026 12:42 File Network 2-.MDX	Designed by rnelson Checked by RF
Micro Drainage	Network 2020.1.3

Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
Sdum1	10.100	0.850	Open Manhole	450	S1.000	9.250	100				
Sdum2	10.100	0.905	Open Manhole	450	S1.001	9.195	100	S1.000	9.195	100	
Sdum3	9.850	0.675	Open Manhole	450	S1.002	9.175	100	S1.001	9.175	100	
Sdums4	10.100	0.945	Open Manhole	450		OUTFALL		S1.002	9.155	100	

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
Sdum1	311658.633	206540.391	311658.633	206540.391	Required	
Sdum2	311649.220	206546.888	311649.220	206546.888	Required	
Sdum3	311647.905	206548.253	311647.905	206548.253	Required	
Sdums4	311646.441	206549.616			No Entry	

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Roof and drive 100+40%ccf	Plot adjacent 63 Brecon Rise MTCBC
Date 21/08/2026 12:42 File Network 2-.MDX	Designed by rnelson Checked by RF
Micro Drainage	Network 2020.1.3

Area Summary for Storm

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	-	-	100	0.003	0.003	0.003
1.001	-	-	100	0.002	0.002	0.002
1.002	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				0.005	0.005	0.005

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
S1.002	Sdums4	10.100	9.155	0.000	450	0

Simulation Criteria for Storm

Volumetric Runoff Coeff	1.000	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Inlet Coeffiecient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1

Number of Input Hydrographs	0	Number of Offline Controls	0	Number of Time/Area Diagrams	0
Number of Online Controls	1	Number of Storage Structures	1	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 306666 209180 So 06666 09180
Data Type	Point
Summer Storms	No
Winter Storms	Yes
Cv (Summer)	1.000
Cv (Winter)	1.000
Storm Duration (mins)	30

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Online Controls for Storm

Pump Manhole: Sdum3, DS/PN: S1.002, Volume (m³): 0.1

Invert Level (m) 9.175

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Roof and drive 100+40%ccf	Plot adjacent 63 Brecon Rise MTCBC
Date 21/08/2026 12:42 File Network 2-.MDX	Designed by rnelson Checked by RF
Micro Drainage	Network 2020.1.3

Storage Structures for Storm

Porous Car Park Manhole: Sdum2, DS/PN: S1.001

Infiltration Coefficient Base (m/hr)	0.00700	Width (m)	2.6
Membrane Percolation (mm/hr)	3000	Length (m)	10.6
Max Percolation (l/s)	23.0	Slope (1:X)	0.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	9.195	Membrane Depth (mm)	0

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Roof and drive 100+40%ccf	Plot adjacent 63 Brecon Rise MTCBC
Date 21/08/2026 12:42 File Network 2-.MDX	Designed by rnelson Checked by RF
Micro Drainage	Network 2020.1.3

Summary of Critical Results by Half Drain Time (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
Hot Start Level (mm) 0 Inlet Coeffiecient 0.800
Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 1 Number of Storage Structures 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FEH
FEH Rainfall Version 2013
Site Location GB 306666 209180 So 06666 09180
Data Type Point
Cv (Summer) 1.000
Cv (Winter) 1.000

Margin for Flood Risk Warning (mm) 100.0
Analysis Timestep 2.5 Second Increment (Extended)
DTS Status ON
DVD Status ON
Inertia Status OFF

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440
Return Period(s) (years) 100
Climate Change (%) 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
S1.000	Sdum1	1440 Winter	100	+40%	100/15 Summer				9.767
S1.001	Sdum2	1440 Winter	100	+40%	100/15 Summer				9.767
S1.002	Sdum3	1440 Winter	100	+40%	100/15 Summer				9.802

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	Sdum1	0.417	0.000	0.03			0.1	SURCHARGED	
S1.001	Sdum2	0.472	0.000	0.04		1438	0.1	SURCHARGED	
S1.002	Sdum3	0.527	0.000	0.00			0.0	FLOOD RISK	

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Infiltration Information

Infiltration Testing For:

63 Brecon Rise,
Merthyr Tydfil,
Wales,
CF48 2EE

Prepared for: **Mathew Phillips**

REF: **63 Brecon Rise #1054**

DATE: 12/08/2026

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Document Control

Project	**63 Brecon Rise**
Client	**Mathew Phillips**
Ref:	**63 Brecon Rise #1054**

Document Checking:

Prepared By: **Oliver Gibbs** **Signed:**

Issue	Date	Status
01	12/08/2026	Written and submitted
02		
03		

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2.1 Method of testing 4
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GibbsGeoTechnical

1 Introduction

1.1 Brief

Gibbs Geotechnical has been instructed by Mathew Phillips (the Client) to undertake 2 soil infiltration tests to BRE365 standard at **63 Brecon Rise, Merthyr Tydfil, Wales, CF48 2EE.**

National Grid Reference:	**SO 06670 09177**
OSGB36 Easting/Northing:	**306670 , 209177**
Latitude, Longitude:	**51.773454 , -3.354075**

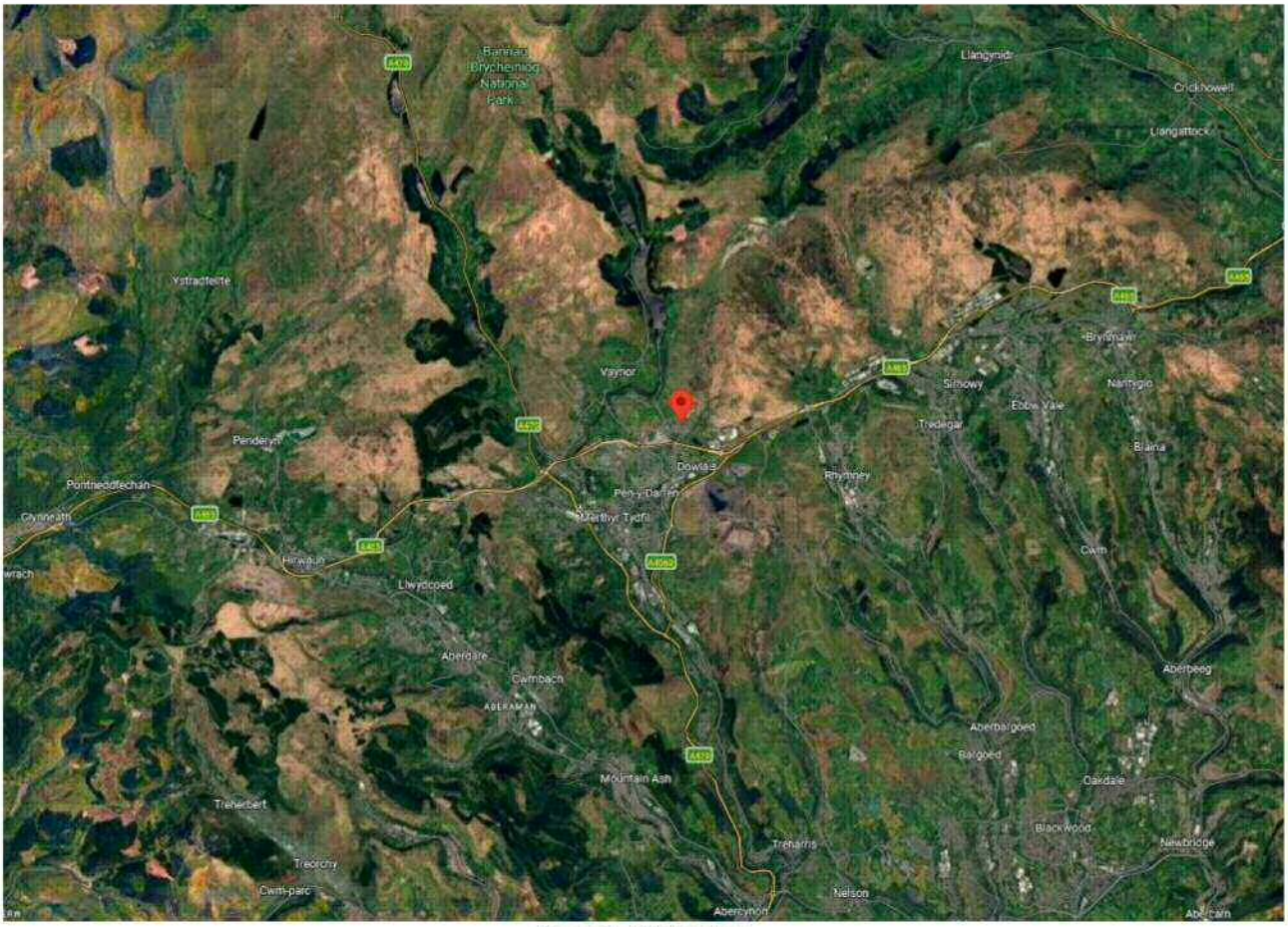

Figure 1 - Site location

2 BRE365 infiltration tests have been proposed to determine the local geology and permeation rates on site. These BRE365 test pits will be 0.5x1x1m minimum and tested a maximum of 3 times or as many as possible in the timeframe allowed. Refer to **Appendix A** – Site Test Plans

1.2 Site Investigations

The tests were performed by Oliver Gibbs (of Gibbs Geotechnical) on 06/08/2026.
Refer to **Appendix B** – Site photos

2 Site findings

The following tests were performed to the best of the ability of those involved, subject to site constraints and weather conditions. The test pits were successfully excavated to 2.0m depth, shown in the location on **Appendix A**.

2.1 British Geological Records

Local searches from the British Geological Survey (BGS) online records show the site to have the following superficial soils and bedrock:

Bedrock: Twrch Sandstone Formation-Interbedded sandstone and conglomerate. These sedimentary rocks are fluvial in origin. They are detrital, ranging from coarse- to fine-grained and form beds and lenses of deposits reflecting the channels, floodplains and levees of a river or estuary (if in a coastal setting).

- Minimum Age (Years):319,000,000
- Minimum Period:Carboniferous
- Maximum Age (Years):329,000,000
- Maximum Period:Carboniferous

Superficial soils N/A – None listed.

Refer to **Appendix C** for BGS records https://geologyviewer.bgs.ac.uk/

2.2 Trial pit soil conditions

Soils encountered were logged at the following approximate depths:

Pit 1

Topsoil:	*0-0.4m*	*- Made ground*
Superficial soils:	*0.4-2.0m*	*- Clay/till*

Pit 2

Topsoil:	*0-0.3m*	*- Grassed loam/silt topsoil*
Superficial soils:	*0.3-2.0m*	*- Till/clay/sand and gravel with 2-30cm jagged mudstone rocks*

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3 Results

Soakaway Test Results - BRE 365 Digest standards			Site: 63 Brecon Rise
			Client: Mathew Phillips
Trial Pit	1	Date:	06/08/2026
		Performed by:	Gabriel Usher (of Gibbs Geotechnical)
Dimensions	(m)	Weather:	Clear and sunny
Width	0.5	Topsoil:	Made ground
Length	1	Superficial soil:	Clay sand and gravel
Total depth of hole	2	Comments	

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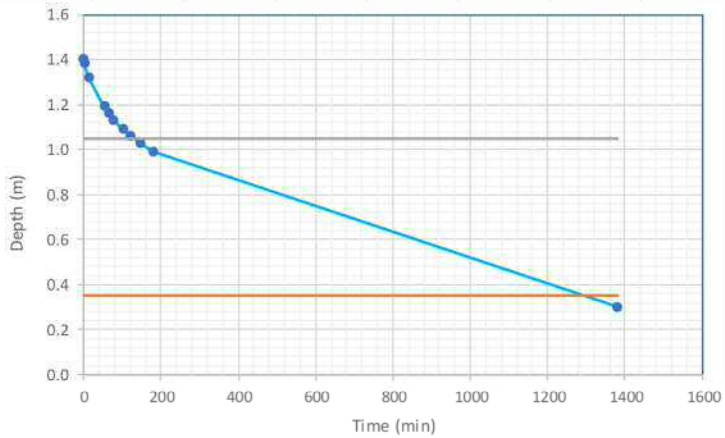
Test No.	Time (min)	Depth (m)		
1	0	1.40	Time (min) 75% =	130
	3	1.38	Time (min) 25% =	1300
	13	1.32	Area (m²) =	0.5
	54	1.19	Depth 75% =	1.05
	65	1.16	Depth 25% =	0.35
	78	1.13	Vp75 (m³) =	0.525
	102	1.09	Vp25 (m³) =	0.175
	123	1.06		
	147	1.03		
	179	0.99		
	1380	0.30	Vp75-25 (m³) =	0.35
			ap50 (m²) =	2.6
			tp75-25 (sec) =	70200
			f (m/s) =	1.92E-06



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Soakaway Test Results - BRE 365 Digest standards

Site:	63 Brecon Rise
Client:	Mathew Phillips

Trial Pit	**2**	**Date:**	06/08/2026
		Performed by:	Gabriel Usher (of Gibbs Geotechnical)
Dimensions	(m)	**Weather:**	Clear and sunny
Width	0.5	**Topsoil:**	Made ground
Length	1	**Superficial soil:**	Till/clay/sand and gravel + 2-30cm jagged mudstone
Total depth of hole	2	**Comments**	

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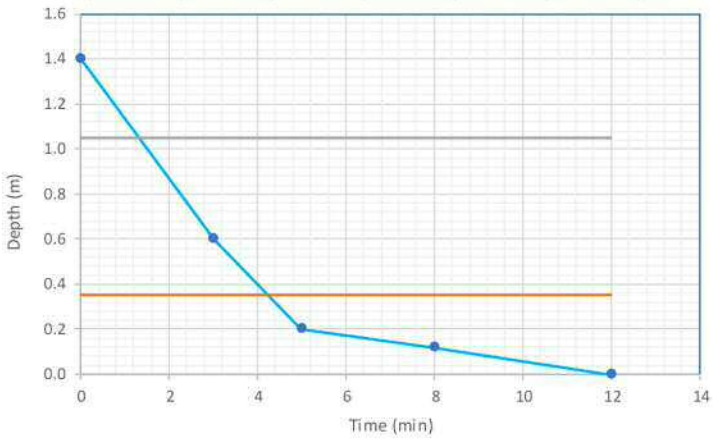
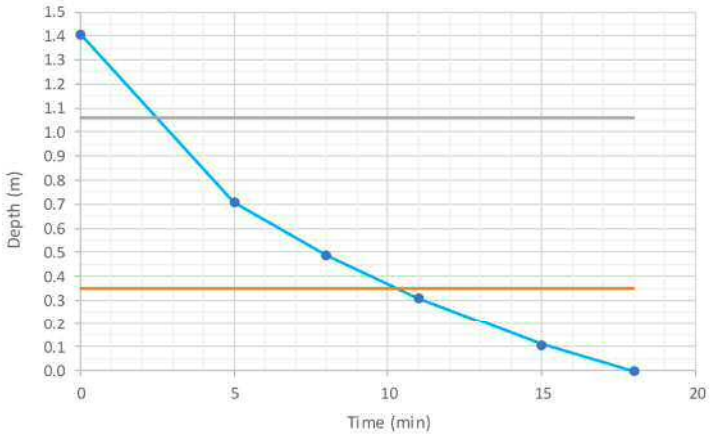
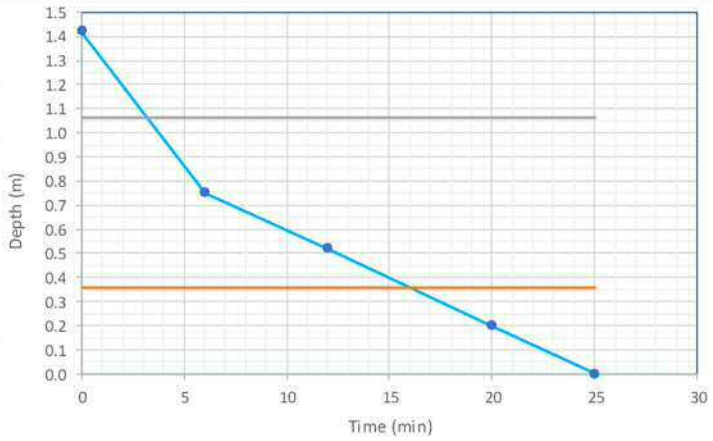
Test No.	Time (min)	Depth (m)		
1	0	1.40	**Time (min) 75% =**	1.5
	3	0.60	**Time (min) 25% =**	4
	5	0.20	**Area (m²) =**	0.5
	8	0.12	**Depth 75% =**	1.05
	12	0.00	**Depth 25% =**	0.35
			Vp75 (m³) =	0.525
			Vp25 (m³) =	0.175
			Vp75-25 (m³) =	0.35
			ap50 (m²) =	2.6
			tp75-25 (sec) =	150
			f (m/s) =	**8.97E-04**



Test No.	Time (min)	Depth (m)		
2	0	1.41	**Time (min) 75% =**	2.5
	5	0.71	**Time (min) 25% =**	10.5
	8	0.49	**Area (m²) =**	0.5
	11	0.31	**Depth 75% =**	1.0575
	15	0.11	**Depth 25% =**	0.3525
	18	0.00	**Vp75 (m³) =**	0.52875
			Vp25 (m³) =	0.17625
			Vp75-25 (m³) =	0.3525
			ap50 (m²) =	2.615
			tp75-25 (sec) =	480
			f (m/s) =	**2.81E-04**



Test No.	Time (min)	Depth (m)		
3	0	1.42	**Time (min) 75% =**	3
	6	0.75	**Time (min) 25% =**	16
	12	0.52	**Area (m²) =**	0.5
	20	0.20	**Depth 75% =**	1.065
	25	0.00	**Depth 25% =**	0.355
			Vp75 (m³) =	0
			Vp25 (m³) =	0
			Vp75-25 (m³) =	0.355
			ap50 (m²) =	2.63
			tp75-25 (sec) =	780
			f (m/s) =	**1.73E-04**



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4 Conclusions

The tests which could be performed in the timeframe allowed found infiltration results of:

Test Pit 1: 1.92E-06m/s
Test Pit 2: 1.73E-04m/s

APPENDIX A: Site Test Plans

Figure 1- Test pit locations

APPENDIX B: Site Photos

Figure 2 - Test pit 1 during excavation

Figure 3 – TP1 strata

Figure 4 – Test pit 1 during filling

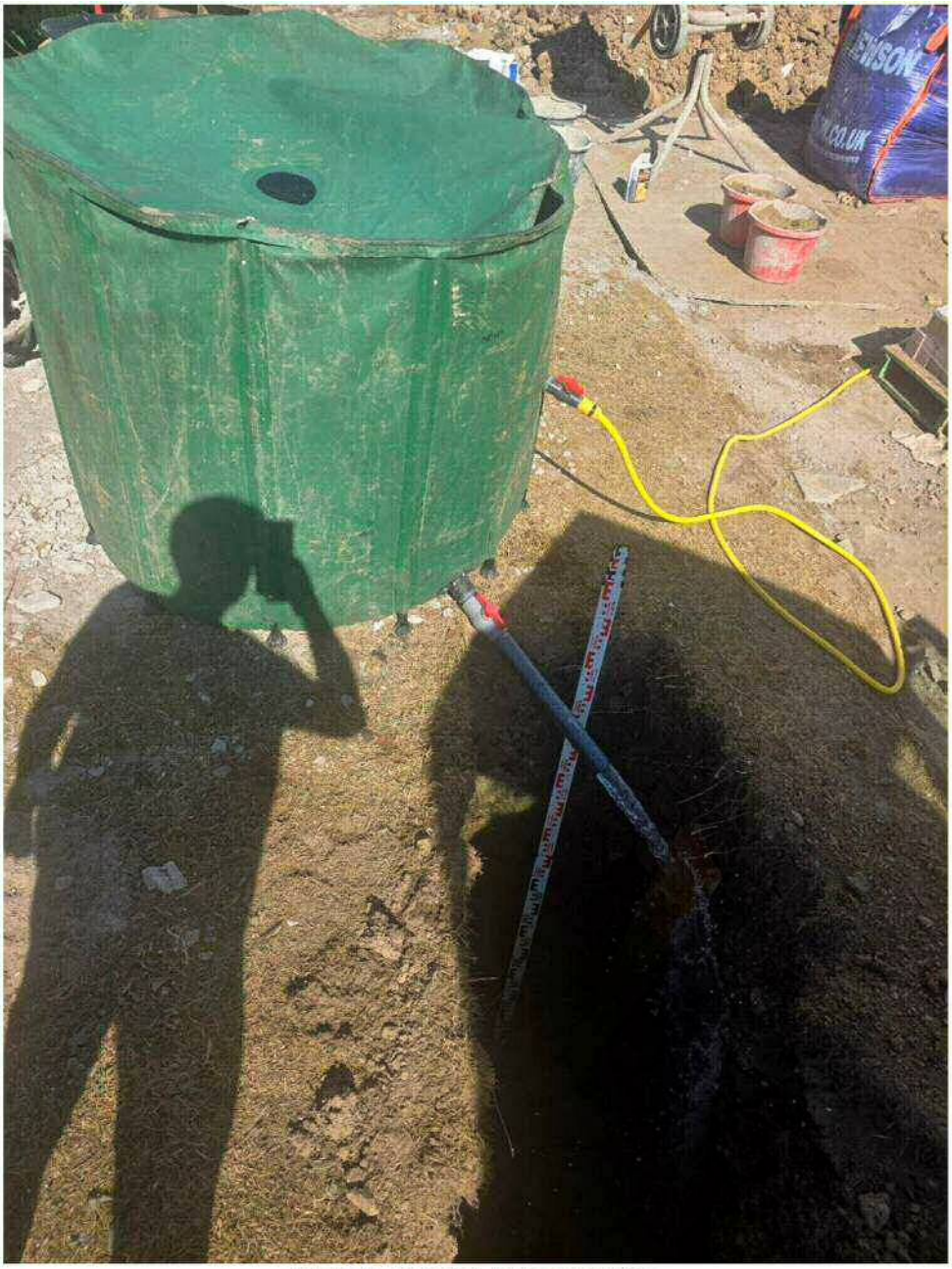

Figure 5 – Test pit 2 during excavation

Figure 6 - Test pit 2 strata

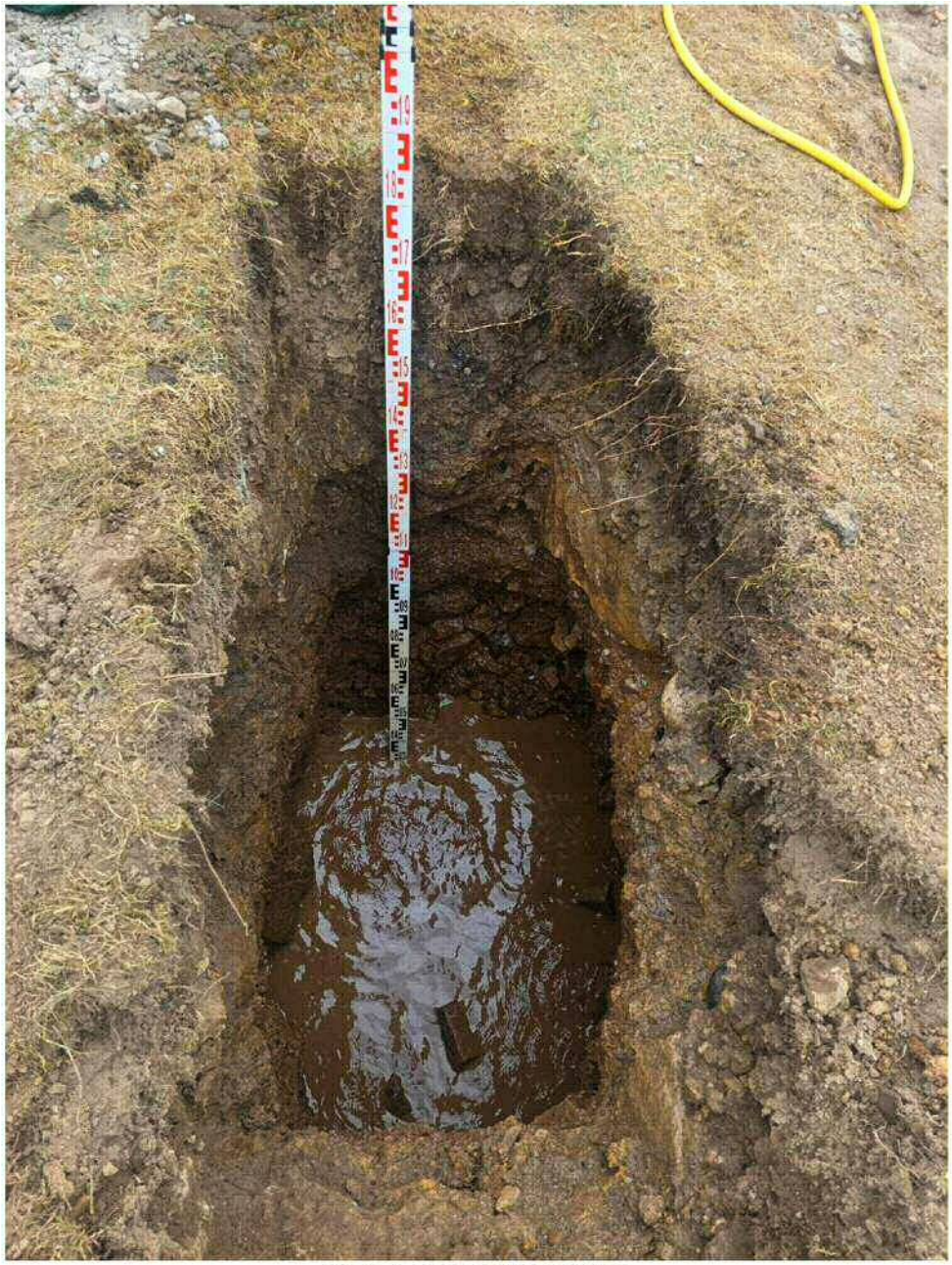

Figure 7 - Test pit 2 during filling

(More pictures available upon request)

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APPENDIX C: BGS Records

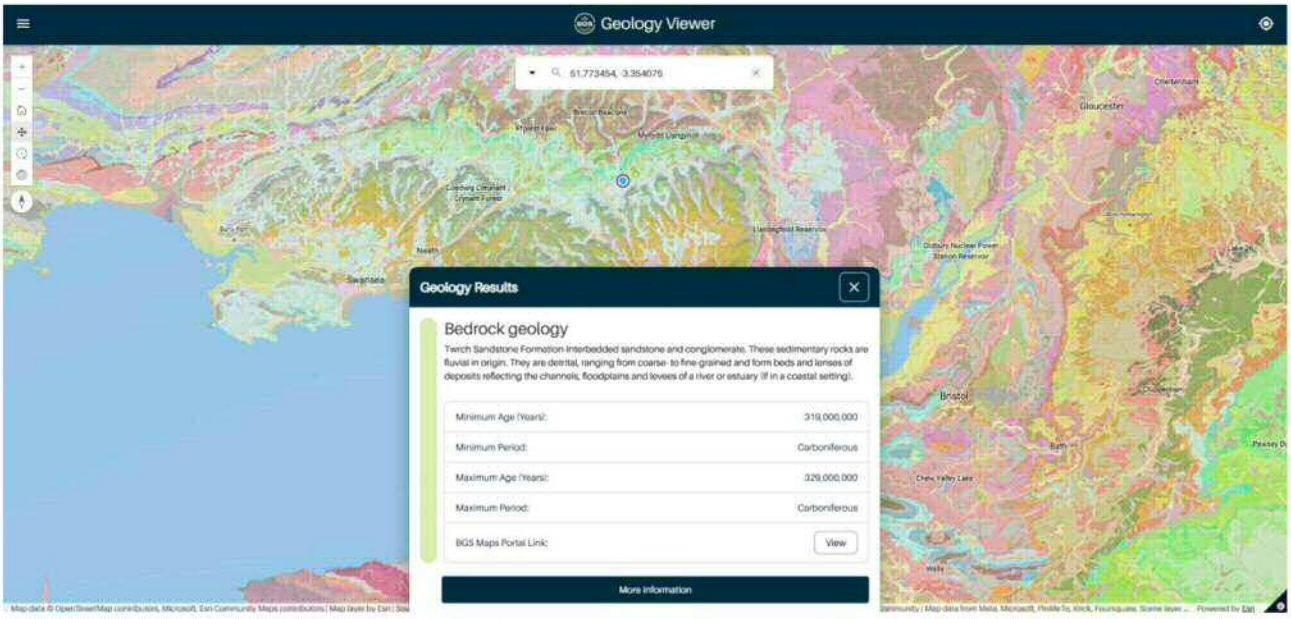

Figure 8 - Royal Geological survey records of the site

Maintenance Details

Infiltration Drainage Operation and Maintenance Requirements

The location of the soakaway should be clearly identified on the development plan, therfore allowing a point of reference to any future property owners or those involved in maintenance.

Infiltration systems will require regular maintenance to ensure continuing operation to the design performance standards. Different designs will have different operation and maintenance requirements.
Maintenance will usually be carried out manually, although a suction tanker can be used for sediment/debris removal for larger systems.
Roads and/or parking areas draining to infiltration components should be regularly swept to prevent silt being washed of the surface. This will minimise the need for maintenance.
Replacement of the aggregate or geocellular units will be necessary if the system becomes blocked with silt.
Effective monitoring will give information on changes in infiltration rate and provide a warning of potential failure in the long term.

Sections 4 and 5 of BRE 365 2016 provides guidence on the construction, maintenance, inspection and monitoring of soakaways
Section 13.12 of The Suds Manual (CIRIA 753) provides guidence on the type of operational and maintenance requirements that may be appropriate.

13.12.1 Soakaways, Trenches and Blankets.
The design of soakaways, infiltration trenches and blankets should include monitoring points where the water level in the system can be observed and measured.
This can either be via an inspection well or inspection cover (where the storage space is a void).
For larger installations the inspection access should provide a clear view of the infiltration surface(even if the storage zone is filled). For small filled soakawys a 50mm perforated pipe is adequate.
The usefull life and effective operation of an infiltration component is related to the frequency of maintenance and the risk of sedement being introduced into the system.

Table 13.1 of The SuDS manual (CIRIA 753) provides guidence on the type of operational and maintenance requirements that may be appropriate for soakaways. The list of actions is not exaustive and some actions may not always be required

CIRIA SuDS Manual 2015

TABLE 13.1 Operation and maintenance requirements for soakaways

Maintenance schedule	Required action	Typical frequency
Regular maintenance	Inspect for sediment and debris in pre-treatment components and floor of inspection tube or chamber and inside of concrete manhole rings	Annually
	Cleaning of gutters and any filters on downpipes	Annually (or as required based on inspections)
	Trimming any roots that may be causing blockages	Annually (or as required)
Occasional maintenance	Remove sediment and debris from pre-treatment components and floor of inspection tube or chamber and inside of concrete manhole rings	As required, based on inspections
Remedial actions	Reconstruct soakaway and/or replace or clean void fill, if performance deteriorates or failure occurs	As required
	Replacement of clogged geotextile (will require reconstruction of soakaway)	As required
Monitoring	Inspect silt traps and note rate of sediment accumulation	Monthly in the first year and then annually
	Check soakaway to ensure emptying is occurring	Annually