

Surface Water Drainage Calculation

**For
Twinham,
34 Hurst Road,
Hassocks,
East Sussex,
BN6 9NL**

**Date: September 2025
Project No: 63770 Rev02**



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Location Plan 1:1250@A1



Block Plan 1:500@A1

B | D

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NOTES

DO NOT SCALE OFF THIS DRAWING.

CHECK ALL DIMENSIONS ON SITE BEFORE ANY WORK IS COMMENCED.
ALL GOODS MATERIALS AND WORKMANSHIP MUST CONFORM WITH CURRENT BUILDING REGULATIONS, BRITISH STANDARDS AND CODES OF PRACTICE.

Rev	Date	By	Amendment
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Client
Mr & Mrs J Bullivant

Site Address
**Land adjacent to Twinham
34 Hurst Road
Hassocks
BN6 9NL**

Project
**Proposed detached dwelling
with parking**

Drawing Title
**Proposed Location and
Block Plans - Planning**

Date	Scale	Drawn By	JM
Dec 2024	1:100@A1	Checked By	JTM
Job No	Dwg No	Rev	
B.043.24	05	*	

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A	26/02/2025	JM	Drainage
Rev	Date	By	Amendment

Client
Mr & Mrs J Bullivant

Site Address
Land adjacent to Twinham
34 Hurst Road
Hassocks
BN6 9NL

Project
Proposed detached dwelling
with parking

Drawing Title
Site Layout Plan - Planning

Date Dec 2024	Scale 1:100@A1	Drawn By JM
		Checked By JTM
Job No B043.24	Dwg No 01	Rev A

PROPOSED SITE LAYOUT PLAN



EXISTING 0.6m x 2.0m DEEP FOUL
SEWER DRAINING STATION
PIL: 61.20
BSL: 62.00(TBC)
DEPTH: 2.00m

NEW FW CONNECTION INTO
THE EXISTING FW MANHOLE
LEVEL: 63.32
DEPTH: 2.00m

ASSUMED ROUTE OF THE EXISTING FW
RISING MAIN TO BE CONFIRMED ON
SITE BY THE CONTRACTOR PRIOR TO
CONSTRUCTION

THE EXISTING FW RISING MAIN TO
BE MAINTAINED AND PROTECTED BY THE
CONTRACTOR DURING CONSTRUCTION

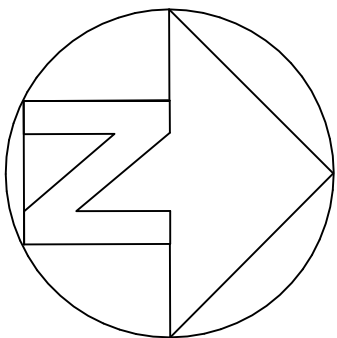
RAIN GARDEN
5m DEEP RAIN GARDEN
FILLED WITH MAXIMUM 300mm LAYER
OF BLENDED COMPOST/SAND AND
NATIVE SOIL ON A SHINGLE BED
INSTALLED IN RESIDENTIAL MEMORANE.

100mm PERFORATED
DISTRIBUTION DRAIN

PERFECT FLOW CONTROL
DISCHARGE ORATE 0.4 L/S

ATTENUATION STORAGE TANK
Eas Versa Void Cellular Structure Modules
(500x500x600mm units)
CL 64.1 (TBC)
BOT: 63.25 (TBC)
TONK SIZE 14.5x2.0x0.40m dp
Storage = 11.02 cum
Note: Greater strength units may be required
depending on the design and soil conditions during the
construction period – Contractor to liaise with
manufacturer.

EXISTING FW RISING MAIN TO PRIVATE
DRAINAGE SYSTEM OF THE HAM SITE
PROPERTY TO BE MAINTAINED



KEY

- Soil Vent Pipe with Rodding Access
- RWP Rain Water Pipe with Rodding Access
- SS Stub Stack with Air Admittance Valve
- RE Rodding Eye
- CD Channel Drain
- FW –Existing Private Surface Water Sewer
- SW –Proposed Private Surface Water Sewer
- SW –Proposed Private Perforate Drain
- SW –Existing Public Surface Water Sewer
- FW –Existing Private Foul Water Sewer
- FW –Proposed Private Foul Water Sewer
- FW –Existing Public Foul Water Sewer
- FW –Existing Private Foul Water Pumping Main
- F6 Foul Manhole
- S6 Surface Water Manhole
- EX.FLIC Existing Private Foul Water Manhole
- Existing Private Foul Water Pumping Station
- SW Rain Garden

FOUL WATER MANHOLE SCHEDULE						
M/H REF	APPROX. COVER LEVEL	INVERT LEVEL	DEPTH (M)	M/H TYPE	COVER TYPE	COMMENTS
F1	65.46	64.86	0.60	3	B125	
F2	64.85	64.20	0.65	3	B125	
F3	64.43	63.83	0.60	3	B125	TO EXISTING FW MH IL:63.26
SURFACE WATER MANHOLE SCHEDULE						
M/H REF	APPROX. COVER LEVEL	INVERT LEVEL	DEPTH (M)	M/H TYPE	COVER TYPE	COMMENTS
RE1	66.00	65.40	0.60	RODDING EYE	-	
S1	64.10	63.50	0.60	3	B125	TO ATTENUATION TANK
RE2	66.00	65.40	0.60	RODDING EYE	-	
S2	65.65	65.00	0.65	3	B125	
S3	64.10	63.50	0.60	3A SILT TRAP	B125	TO ATTENUATION TANK
S4	64.00	63.25	0.75	3B 600ø FLOW CONTROL MH	B125	TO RAIN GARDEN

In addition to these notes, reference shall be made to the specification of works and the relevant Architect's and Specialist's drawings and specifications. The Contractor is responsible for verifying all site dimensions before commencing works.

All dimensions are in millimetres unless noted otherwise.

This drawing has been produced electronically and may have been photo reduced or enlarged when printed or copied. Dimensions on this drawing shall be taken from the electronic file and not the printed drawing. Any discrepancies or errors or omissions are to be reported to the engineer immediately.

Levels are in metres unless noted otherwise to Ordnance Survey datum.

The Contractor is responsible for the stability of the building whilst the works are in progress.

NOTES

- THIS DRAWING IS BASED ON DRAWING NO. B04.3.24 BY BELMONT DESIGNS ARCHITECTURE PRACTICE LIMITED.
- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THE FOLLOWING DRAWING:
63770/11 DRAINAGE DETAILS SHEET 1 OF 2
63770/12 DRAINAGE DETAILS SHEET 2 OF 2
- CONTRACTOR IS TO TAKE NECESSARY PRECAUTIONS TO ENSURE THAT TRENCHES ARE KEPT CLEAR OF GROUND WATER DURING CONSTRUCTION.
- ALL DRAINAGE WORKS TO BE CARRIED OUT IN ACCORDANCE WITH 'SEWERS FOR ADOPTION' 7TH EDITION.
- ALL ADOPTED PIPEWORK TO BE 100% VITRIFIED CLAY UNLESS NOTED OTHERWISE.
- ALL PIPEWORK THROUGH WALLS TO BE IN ACCORDANCE WITH THE BUILDING REGULATIONS.
- ALL PIPEWORK UNDER ROADS WITH LESS THAN 900MM COVER TO HAVE 150MM CONCRETE SURROUND.
- MINIMUM GRADIENT TO DRAINS TO BE 1:40 FOR 110Ø OR 110Ø FW AND 1:100 FOR 110Ø SW.
- ALL ADOPTED PIPEWORK, DRAINAGE LATERALS OR PIPE CONNECTION TO THE PUBLIC SHALL BE VITRIFIED CLAY (VC) PIPE MATERIAL TO SOUTHERN WATER APPROVAL.
- POSITIONS OF MANHOLES SHOWN ON THIS DRAWING ARE INDICATIVE ONLY. ACTUAL LOCATIONS TO BE FINALIZED ON SITE.
- PROVIDE CONCRETE LINTELS OVER OPENINGS WHERE PIPES PASS THROUGH WALLS. ALLOW FOR 150MM CLEARANCE ALL ROUND PIPE.

ALL DIMENSIONS AND LEVELS
TO BE CHECKED AND
CONFIRMED BY THE ARCHITECT
PRIOR TO CONSTRUCTION.

C	MENDED SW DRAINAGE LAYOUT	04/08/25JS
B	MENDED SW DRAINAGE LAYOUT	07/08/25JS
A	MENDED DRAINAGE LAYOUT	05/06/25JS
O	ORIGINAL ISSUE	30/04/25JS
REV	DESCRIPTION	DATE BY

DIXON HURST

CONSULTING CIVIL & STRUCTURAL ENGINEERS

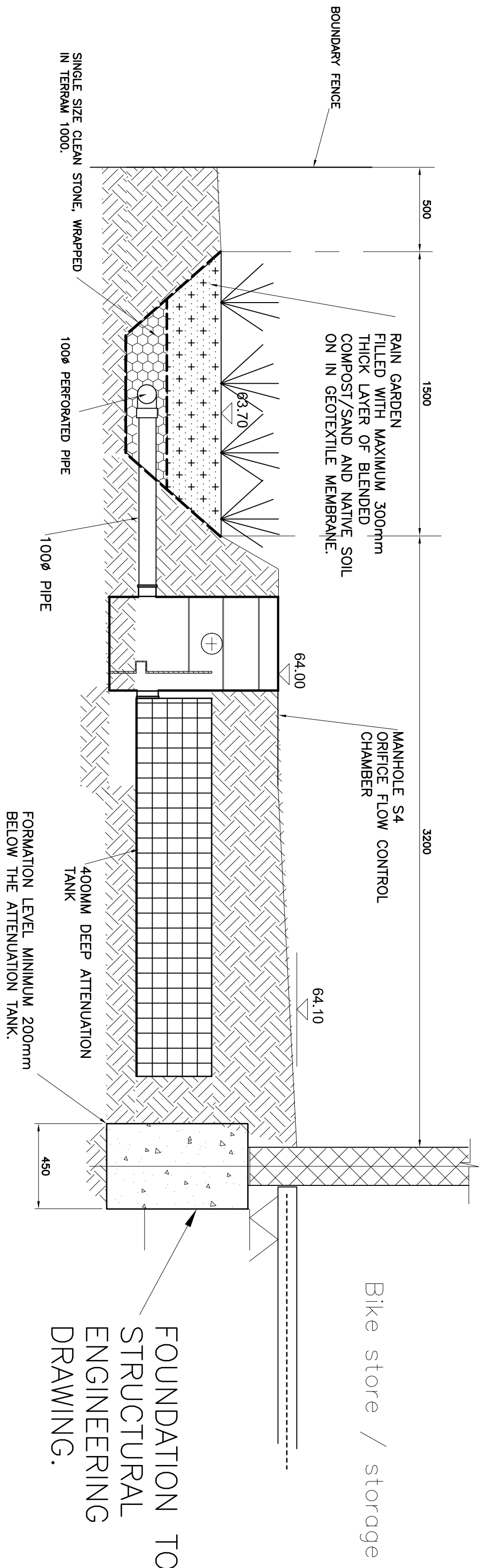
HEDERSHAM HOUSE, 18-22 BOUNDARY ROAD, HOVE, BN1 4EF
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www.dih.co.uk

Registered in England No. 3483720 - Registered Office 4 Franchise, Totton, Brighton BN1 1AX

CONTRACT
**LAND ADJACENT TO TWINHAM
34 HURST ROAD,
HAS SOCKS, BN6 9NL**

DRAWING		
DRAINAGE LAYOUT		
DRAWING NO.	REV	CHECKED
63770 / 10	C	
SCALE 1:125@ A1	DATE JULY 25	DRAWN APPROVED
AutoCAD Ref: 63770-10.dwg	JS	

This drawing is produced using AutoCAD. Only written dimensions are to be respected.



SECTION THROUGH ATTENUATION TANK,
FLOW CONTROL AND RAIN GARDEN

SCALE 1:20

FOUNDATION TO
STRUCTURAL
ENGINEERING
DRAWING.

Bike store / storage

In addition to these notes, reference shall be made to the specification of works and the relevant Architect's and Specialist's drawings and specifications. The Contractor is responsible for verifying all site dimensions before commencing work.

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63770/11 DRAINAGE DETAIL SHEET 1 OF 2
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PRIOR TO CONSTRUCTION.

0	ORIGINAL ISSUE	04/09/25	JS
REV	DESCRIPTION	DATE	BY

DIXON HURST

CONSULTING CIVIL & STRUCTURAL ENGINEERS

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CONTRACT

LAND ADJACENT TO TWINHAM
34 HURST ROAD,
HASSECKS, BN6 9NL

DRAINAGE DETAILS
SHEET 2 OF 2

DRAWING No.	63770	/ 11	REV	0	CHECKED
SCALE	1:20 @	A1	DATE	SEPT 25	
AutoCAD Ref: 63770--10.dwg			DRAWN	JS	APPROVED

AutoCAD Ref: 63770-10.dwg

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Dixon Hurst Kemp		Page 1
Victoria Court	Twinham 34 Hurst Road Hass...	
22 St Pancras	Surface Water Drainage	
West Sussex PO19 7GD	Attenuation Tank Design Rev01	
Date Sept 25	Designed by JS	
File ATTENUATION TANK REV0...	Checked by	
Elstree Computing Ltd	Source Control w.12.6	

Summary of Results for 1 year Return Period (+45%)

Half Drain Time : 220 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	63.309	0.059	0.0	0.1	0.1	1.6	OK
30 min Summer	63.327	0.077	0.0	0.1	0.1	2.1	OK
60 min Summer	63.346	0.096	0.0	0.1	0.1	2.7	OK
120 min Summer	63.363	0.113	0.0	0.2	0.2	3.1	OK
180 min Summer	63.371	0.121	0.0	0.2	0.2	3.3	OK
240 min Summer	63.376	0.126	0.0	0.2	0.2	3.5	OK
360 min Summer	63.380	0.130	0.0	0.2	0.2	3.6	OK
480 min Summer	63.382	0.132	0.0	0.2	0.2	3.6	OK
600 min Summer	63.382	0.132	0.0	0.2	0.2	3.6	OK
720 min Summer	63.381	0.131	0.0	0.2	0.2	3.6	OK
960 min Summer	63.377	0.127	0.0	0.2	0.2	3.5	OK
1440 min Summer	63.369	0.119	0.0	0.2	0.2	3.3	OK
2160 min Summer	63.356	0.106	0.0	0.1	0.1	2.9	OK
2880 min Summer	63.344	0.094	0.0	0.1	0.1	2.6	OK
4320 min Summer	63.327	0.077	0.0	0.1	0.1	2.1	OK
5760 min Summer	63.315	0.065	0.0	0.1	0.1	1.8	OK
7200 min Summer	63.306	0.056	0.0	0.1	0.1	1.5	OK
8640 min Summer	63.298	0.048	0.0	0.1	0.1	1.3	OK
10080 min Summer	63.293	0.043	0.0	0.1	0.1	1.2	OK
15 min Winter	63.309	0.059	0.0	0.1	0.1	1.6	OK
30 min Winter	63.327	0.077	0.0	0.1	0.1	2.1	OK
60 min Winter	63.346	0.096	0.0	0.1	0.1	2.7	OK
120 min Winter	63.364	0.114	0.0	0.2	0.2	3.1	OK

Storm Event	Rain (mm/hr)	Time-Peak (mins)
15 min Summer	42.867	25
30 min Summer	28.558	39
60 min Summer	18.560	66
120 min Summer	11.847	122
180 min Summer	9.076	162
240 min Summer	7.499	194
360 min Summer	5.677	258
480 min Summer	4.658	328
600 min Summer	3.996	398
720 min Summer	3.526	466
960 min Summer	2.895	604
1440 min Summer	2.194	870
2160 min Summer	1.659	1256
2880 min Summer	1.362	1628
4320 min Summer	1.032	2376
5760 min Summer	0.848	3112
7200 min Summer	0.726	3816
8640 min Summer	0.639	4504
10080 min Summer	0.574	5248
15 min Winter	42.867	25
30 min Winter	28.558	38
60 min Winter	18.560	66
120 min Winter	11.847	120

Dixon Hurst Kemp		Page 2
Victoria Court 22 St Pancras West Sussex PO19 7GD	Twinham 34 Hurst Road Hass... Surface Water Drainage Attenuation Tank Design Rev01	
Date Sept 25	Designed by JS	
File ATTENUATION TANK REV0...	Checked by	
Elstree Computing Ltd	Source Control w.12.6	

Summary of Results for 1 year Return Period (+45%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
180 min Winter	63.372	0.122	0.0	0.2	0.2	3.3	0 K
240 min Winter	63.376	0.126	0.0	0.2	0.2	3.5	0 K
360 min Winter	63.379	0.129	0.0	0.2	0.2	3.5	0 K
480 min Winter	63.379	0.129	0.0	0.2	0.2	3.5	0 K
600 min Winter	63.377	0.127	0.0	0.2	0.2	3.5	0 K
720 min Winter	63.374	0.124	0.0	0.2	0.2	3.4	0 K
960 min Winter	63.368	0.118	0.0	0.2	0.2	3.2	0 K
1440 min Winter	63.354	0.104	0.0	0.1	0.1	2.9	0 K
2160 min Winter	63.337	0.087	0.0	0.1	0.1	2.4	0 K
2880 min Winter	63.323	0.073	0.0	0.1	0.1	2.0	0 K
4320 min Winter	63.304	0.054	0.0	0.1	0.1	1.5	0 K
5760 min Winter	63.293	0.043	0.0	0.1	0.1	1.2	0 K
7200 min Winter	63.285	0.035	0.0	0.1	0.1	1.0	0 K
8640 min Winter	63.279	0.029	0.0	0.1	0.1	0.8	0 K
10080 min Winter	63.276	0.026	0.0	0.1	0.1	0.7	0 K

Storm Event	Rain (mm/hr)	Time-Peak (mins)
180 min Winter	9.076	174
240 min Winter	7.499	198
360 min Winter	5.677	274
480 min Winter	4.658	352
600 min Winter	3.996	426
720 min Winter	3.526	500
960 min Winter	2.895	644
1440 min Winter	2.194	918
2160 min Winter	1.659	1308
2880 min Winter	1.362	1684
4320 min Winter	1.032	2424
5760 min Winter	0.848	3120
7200 min Winter	0.726	3824
8640 min Winter	0.639	4576
10080 min Winter	0.574	5240

Dixon Hurst Kemp		Page 3
Victoria Court 22 St Pancras West Sussex PO19 7GD	Twinham 34 Hurst Road Hass... Surface Water Drainage Attenuation Tank Design Rev01	
Date Sept 25	Designed by JS	
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Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	1	Cv (Summer)	1.000
Region	England and Wales	Cv (Winter)	1.000
M5-60 (mm)	20.000	Shortest Storm (mins)	15
Ratio R	0.347	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+45

Time / Area Diagram

Total Area (ha) 0.016

Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.005	4-8	0.005	8-12	0.005

Dixon Hurst Kemp		Page 4
Victoria Court 22 St Pancras West Sussex PO19 7GD	Twinham 34 Hurst Road Hass... Surface Water Drainage Attenuation Tank Design Rev01	
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Model Details

Storage is Online Cover Level (m) 64.100

Cellular Storage Structure

Invert Level (m) 63.250 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

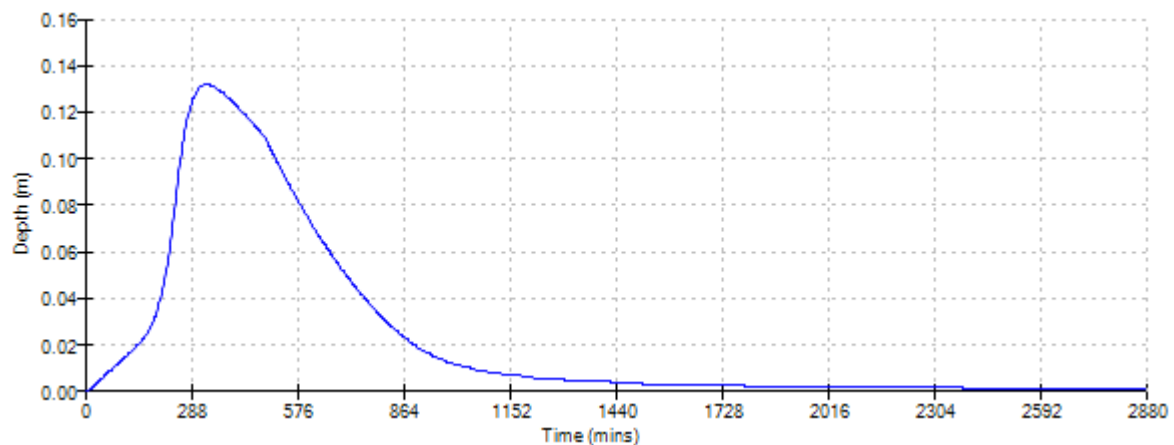
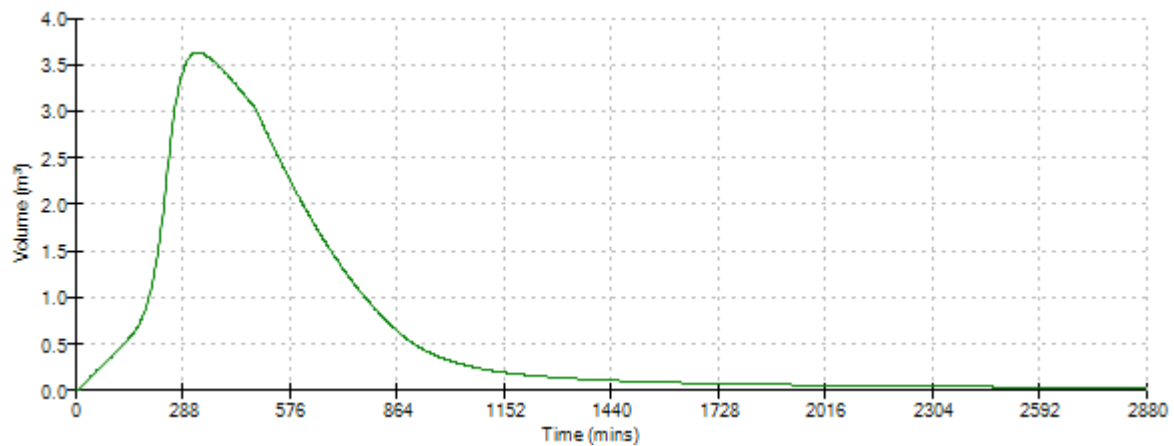
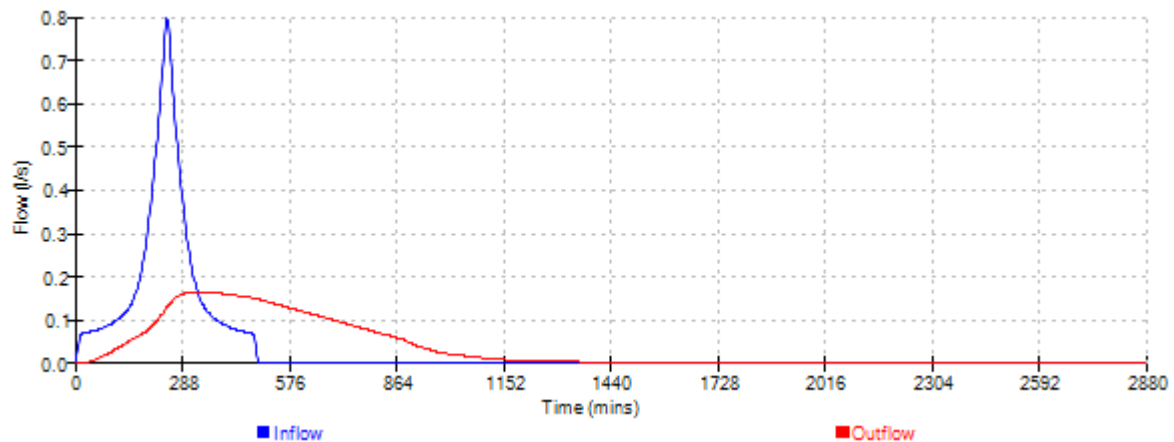
Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	29.0	29.0	0.500	0.0	42.2
0.400	29.0	42.2			

Orifice Outflow Control

Diameter (m) 0.015 Discharge Coefficient 0.600 Invert Level (m) 63.250

Dixon Hurst Kemp		Page 5
Victoria Court 22 St Pancras West Sussex PO19 7GD	Twinham 34 Hurst Road Hass... Surface Water Drainage Attenuation Tank Design Rev01	
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Event: 480 min Summer



Dixon Hurst Kemp		Page 1
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Summary of Results for 30 year Return Period (+45%)

Half Drain Time : 334 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	63.397	0.147	0.0	0.2	0.2	4.0	OK
30 min Summer	63.443	0.193	0.0	0.2	0.2	5.3	OK
60 min Summer	63.489	0.239	0.0	0.2	0.2	6.6	OK
120 min Summer	63.530	0.280	0.0	0.2	0.2	7.7	OK
180 min Summer	63.547	0.297	0.0	0.3	0.3	8.2	OK
240 min Summer	63.553	0.303	0.0	0.3	0.3	8.3	OK
360 min Summer	63.559	0.309	0.0	0.3	0.3	8.5	OK
480 min Summer	63.560	0.310	0.0	0.3	0.3	8.6	OK
600 min Summer	63.560	0.310	0.0	0.3	0.3	8.5	OK
720 min Summer	63.557	0.307	0.0	0.3	0.3	8.5	OK
960 min Summer	63.549	0.299	0.0	0.3	0.3	8.2	OK
1440 min Summer	63.529	0.279	0.0	0.2	0.2	7.7	OK
2160 min Summer	63.500	0.250	0.0	0.2	0.2	6.9	OK
2880 min Summer	63.473	0.223	0.0	0.2	0.2	6.2	OK
4320 min Summer	63.432	0.182	0.0	0.2	0.2	5.0	OK
5760 min Summer	63.402	0.152	0.0	0.2	0.2	4.2	OK
7200 min Summer	63.379	0.129	0.0	0.2	0.2	3.6	OK
8640 min Summer	63.362	0.112	0.0	0.2	0.2	3.1	OK
10080 min Summer	63.348	0.098	0.0	0.1	0.1	2.7	OK
15 min Winter	63.397	0.147	0.0	0.2	0.2	4.0	OK
30 min Winter	63.443	0.193	0.0	0.2	0.2	5.3	OK
60 min Winter	63.490	0.240	0.0	0.2	0.2	6.6	OK
120 min Winter	63.531	0.281	0.0	0.2	0.2	7.7	OK

Storm Event	Rain (mm/hr)	Time-Peak (mins)
15 min Summer	105.082	26
30 min Summer	70.021	40
60 min Summer	44.676	68
120 min Summer	27.642	124
180 min Summer	20.622	182
240 min Summer	16.674	234
360 min Summer	12.359	290
480 min Summer	9.980	354
600 min Summer	8.449	422
720 min Summer	7.371	492
960 min Summer	5.939	628
1440 min Summer	4.374	902
2160 min Summer	3.217	1300
2880 min Summer	2.585	1684
4320 min Summer	1.896	2428
5760 min Summer	1.521	3176
7200 min Summer	1.282	3896
8640 min Summer	1.116	4592
10080 min Summer	0.992	5344
15 min Winter	105.082	26
30 min Winter	70.021	39
60 min Winter	44.676	68
120 min Winter	27.642	122

Dixon Hurst Kemp		Page 2
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Elstree Computing Ltd	Source Control w.12.6	

Summary of Results for 30 year Return Period (+45%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
180 min Winter	63.548	0.298	0.0	0.3	0.3	8.2	0 K
240 min Winter	63.555	0.305	0.0	0.3	0.3	8.4	0 K
360 min Winter	63.559	0.309	0.0	0.3	0.3	8.5	0 K
480 min Winter	63.559	0.309	0.0	0.3	0.3	8.5	0 K
600 min Winter	63.556	0.306	0.0	0.3	0.3	8.4	0 K
720 min Winter	63.551	0.301	0.0	0.3	0.3	8.3	0 K
960 min Winter	63.538	0.288	0.0	0.2	0.2	7.9	0 K
1440 min Winter	63.508	0.258	0.0	0.2	0.2	7.1	0 K
2160 min Winter	63.468	0.218	0.0	0.2	0.2	6.0	0 K
2880 min Winter	63.435	0.185	0.0	0.2	0.2	5.1	0 K
4320 min Winter	63.388	0.138	0.0	0.2	0.2	3.8	0 K
5760 min Winter	63.356	0.106	0.0	0.1	0.1	2.9	0 K
7200 min Winter	63.335	0.085	0.0	0.1	0.1	2.3	0 K
8640 min Winter	63.320	0.070	0.0	0.1	0.1	1.9	0 K
10080 min Winter	63.309	0.059	0.0	0.1	0.1	1.6	0 K

Storm Event	Rain (mm/hr)	Time-Peak (mins)
180 min Winter	20.622	178
240 min Winter	16.674	234
360 min Winter	12.359	298
480 min Winter	9.980	372
600 min Winter	8.449	448
720 min Winter	7.371	526
960 min Winter	5.939	674
1440 min Winter	4.374	962
2160 min Winter	3.217	1368
2880 min Winter	2.585	1764
4320 min Winter	1.896	2512
5760 min Winter	1.521	3232
7200 min Winter	1.282	3968
8640 min Winter	1.116	4672
10080 min Winter	0.992	5352

Dixon Hurst Kemp		Page 3
Victoria Court 22 St Pancras West Sussex PO19 7GD	Twinham 34 Hurst Road Hass... Surface Water Drainage Attenuation Tank Design Rev01	
Date Sept 25	Designed by JS	
File ATTENUATION TANK REV0...	Checked by	
Elstree Computing Ltd	Source Control w.12.6	

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	30	Cv (Summer)	1.000
Region	England and Wales	Cv (Winter)	1.000
M5-60 (mm)	20.000	Shortest Storm (mins)	15
Ratio R	0.347	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+45

Time / Area Diagram

Total Area (ha) 0.016

Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.005	4-8	0.005	8-12	0.005

Dixon Hurst Kemp		Page 4
Victoria Court 22 St Pancras West Sussex PO19 7GD	Twinham 34 Hurst Road Hass... Surface Water Drainage Attenuation Tank Design Rev01	
Date Sept 25	Designed by JS	
File ATTENUATION TANK REV0...	Checked by	
Elstree Computing Ltd	Source Control w.12.6	

Model Details

Storage is Online Cover Level (m) 64.100

Cellular Storage Structure

Invert Level (m) 63.250 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

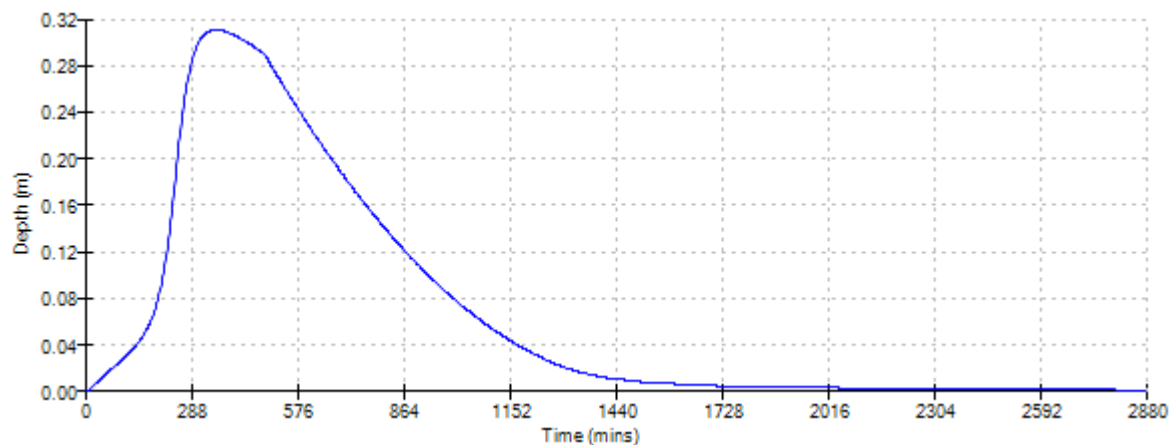
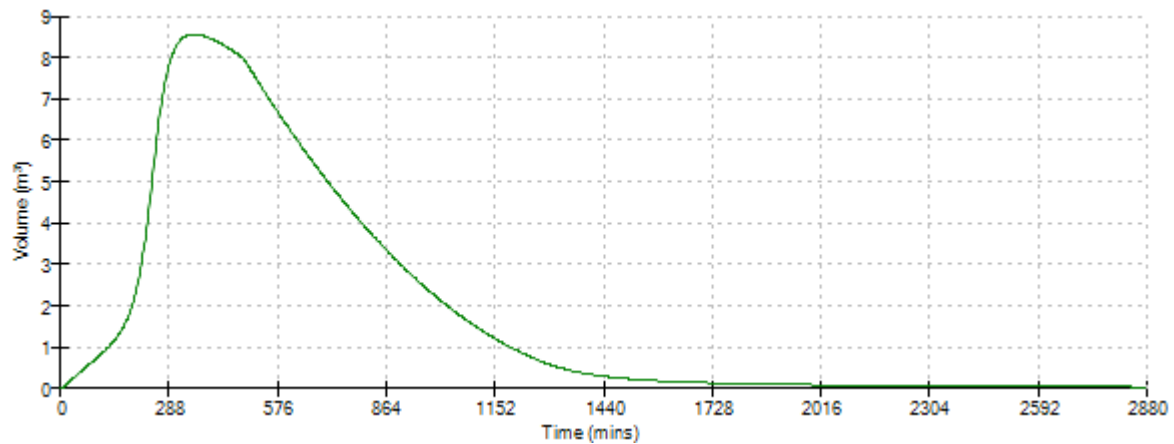
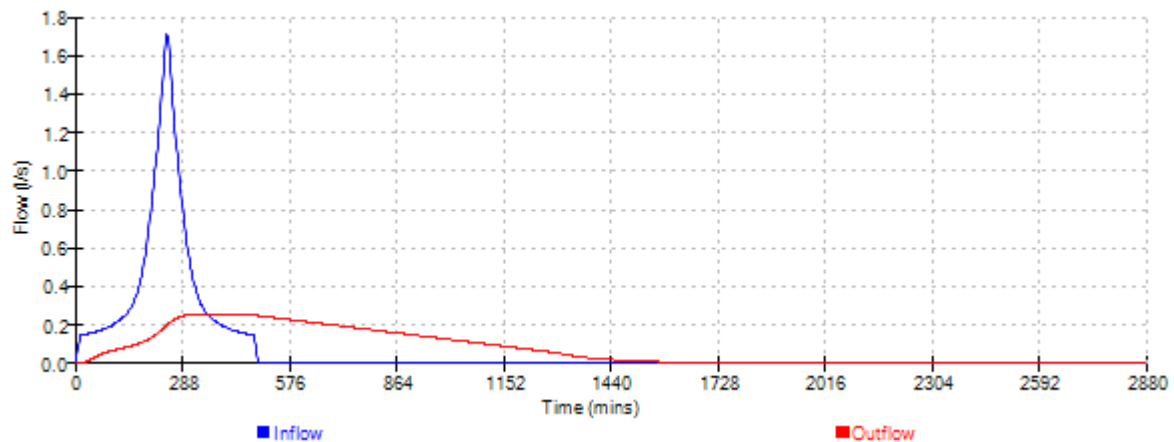
Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	29.0	29.0	0.500	0.0	42.2
0.400	29.0	42.2			

Orifice Outflow Control

Diameter (m) 0.015 Discharge Coefficient 0.600 Invert Level (m) 63.250

Dixon Hurst Kemp		Page 5
Victoria Court 22 St Pancras West Sussex PO19 7GD	Twinham 34 Hurst Road Hass...	
	Surface Water Drainage Attenuation Tank Design Rev01	
	Designed by JS	
Date Sept 25	Checked by	
File ATTENUATION TANK REV0...	Source Control w.12.6	
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Event: 480 min Summer



Dixon Hurst Kemp		Page 1
Victoria Court 22 St Pancras West Sussex PO19 7GD	Twinham 34 Hurst Road Hass... Surface Water Drainage Attenuation Tank Design Rev01	
Date Sept 25	Designed by JS	
File ATTENUATION TANK REV0...	Checked by	
Elstree Computing Ltd	Source Control w.12.6	

Summary of Results for 100 year Return Period (+45%)

Half Drain Time : 374 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	63.441	0.191	0.0	0.2	0.2	5.3	OK
30 min Summer	63.504	0.254	0.0	0.2	0.2	7.0	OK
60 min Summer	63.568	0.318	0.0	0.3	0.3	8.8	OK
120 min Summer	63.624	0.374	0.0	0.3	0.3	10.3	OK
180 min Summer	63.646	0.396	0.0	0.3	0.3	10.9	OK
240 min Summer	63.655	0.405	0.0	0.3	0.3	11.2	OK
360 min Summer	63.661	0.411	0.0	0.3	0.3	11.3	OK
480 min Summer	63.663	0.413	0.0	0.3	0.3	11.3	OK
600 min Summer	63.661	0.411	0.0	0.3	0.3	11.3	OK
720 min Summer	63.657	0.407	0.0	0.3	0.3	11.2	OK
960 min Summer	63.647	0.397	0.0	0.3	0.3	10.9	OK
1440 min Summer	63.621	0.371	0.0	0.3	0.3	10.2	OK
2160 min Summer	63.581	0.331	0.0	0.3	0.3	9.1	OK
2880 min Summer	63.547	0.297	0.0	0.3	0.3	8.2	OK
4320 min Summer	63.492	0.242	0.0	0.2	0.2	6.7	OK
5760 min Summer	63.452	0.202	0.0	0.2	0.2	5.6	OK
7200 min Summer	63.421	0.171	0.0	0.2	0.2	4.7	OK
8640 min Summer	63.398	0.148	0.0	0.2	0.2	4.1	OK
10080 min Summer	63.379	0.129	0.0	0.2	0.2	3.6	OK
15 min Winter	63.441	0.191	0.0	0.2	0.2	5.3	OK
30 min Winter	63.504	0.254	0.0	0.2	0.2	7.0	OK
60 min Winter	63.568	0.318	0.0	0.3	0.3	8.8	OK
120 min Winter	63.625	0.375	0.0	0.3	0.3	10.3	OK

Storm Event	Rain (mm/hr)	Time-Peak (mins)
15 min Summer	136.149	26
30 min Summer	91.587	40
60 min Summer	58.739	68
120 min Summer	36.305	126
180 min Summer	26.955	184
240 min Summer	21.679	240
360 min Summer	15.967	306
480 min Summer	12.831	368
600 min Summer	10.820	432
720 min Summer	9.407	500
960 min Summer	7.537	640
1440 min Summer	5.504	914
2160 min Summer	4.010	1320
2880 min Summer	3.199	1708
4320 min Summer	2.322	2468
5760 min Summer	1.848	3184
7200 min Summer	1.549	3904
8640 min Summer	1.341	4664
10080 min Summer	1.188	5352
15 min Winter	136.149	26
30 min Winter	91.587	40
60 min Winter	58.739	68
120 min Winter	36.305	124

Dixon Hurst Kemp		Page 2
Victoria Court 22 St Pancras West Sussex PO19 7GD	Twinham 34 Hurst Road Hass... Surface Water Drainage Attenuation Tank Design Rev01	
Date Sept 25	Designed by JS	
File ATTENUATION TANK REV0...	Checked by	
Elstree Computing Ltd	Source Control w.12.6	

Summary of Results for 100 year Return Period (+45%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
180 min Winter	63.648	0.398	0.0	0.3	0.3	11.0	0 K
240 min Winter	63.658	0.408	0.0	0.3	0.3	11.2	0 K
360 min Winter	63.663	0.413	0.0	0.3	0.3	11.3	0 K
480 min Winter	63.662	0.412	0.0	0.3	0.3	11.3	0 K
600 min Winter	63.658	0.408	0.0	0.3	0.3	11.2	0 K
720 min Winter	63.651	0.401	0.0	0.3	0.3	11.0	0 K
960 min Winter	63.635	0.385	0.0	0.3	0.3	10.6	0 K
1440 min Winter	63.597	0.347	0.0	0.3	0.3	9.6	0 K
2160 min Winter	63.545	0.295	0.0	0.3	0.3	8.1	0 K
2880 min Winter	63.502	0.252	0.0	0.2	0.2	6.9	0 K
4320 min Winter	63.438	0.188	0.0	0.2	0.2	5.2	0 K
5760 min Winter	63.395	0.145	0.0	0.2	0.2	4.0	0 K
7200 min Winter	63.365	0.115	0.0	0.2	0.2	3.2	0 K
8640 min Winter	63.344	0.094	0.0	0.1	0.1	2.6	0 K
10080 min Winter	63.329	0.079	0.0	0.1	0.1	2.2	0 K

Storm Event	Rain (mm/hr)	Time-Peak (mins)
180 min Winter	26.955	180
240 min Winter	21.679	236
360 min Winter	15.967	336
480 min Winter	12.831	380
600 min Winter	10.820	458
720 min Winter	9.407	534
960 min Winter	7.537	686
1440 min Winter	5.504	976
2160 min Winter	4.010	1392
2880 min Winter	3.199	1792
4320 min Winter	2.322	2556
5760 min Winter	1.848	3288
7200 min Winter	1.549	4032
8640 min Winter	1.341	4688
10080 min Winter	1.188	5440

Dixon Hurst Kemp		Page 3
Victoria Court 22 St Pancras West Sussex PO19 7GD	Twinham 34 Hurst Road Hass... Surface Water Drainage Attenuation Tank Design Rev01	
Date Sept 25	Designed by JS	
File ATTENUATION TANK REV0...	Checked by	
Elstree Computing Ltd	Source Control w.12.6	

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	1.000
Region	England and Wales	Cv (Winter)	1.000
M5-60 (mm)	20.000	Shortest Storm (mins)	15
Ratio R	0.347	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+45

Time / Area Diagram

Total Area (ha) 0.016

Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.005	4-8	0.005	8-12	0.005

Dixon Hurst Kemp		Page 4
Victoria Court 22 St Pancras West Sussex PO19 7GD	Twinham 34 Hurst Road Hass... Surface Water Drainage Attenuation Tank Design Rev01	
Date Sept 25	Designed by JS	
File ATTENUATION TANK REV0...	Checked by	
Elstree Computing Ltd	Source Control w.12.6	

Model Details

Storage is Online Cover Level (m) 64.100

Cellular Storage Structure

Invert Level (m) 63.250 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

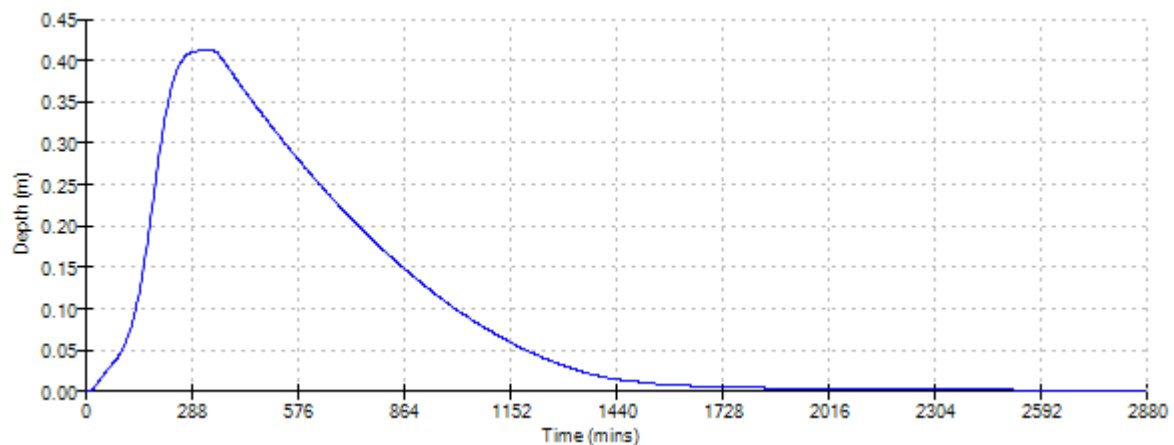
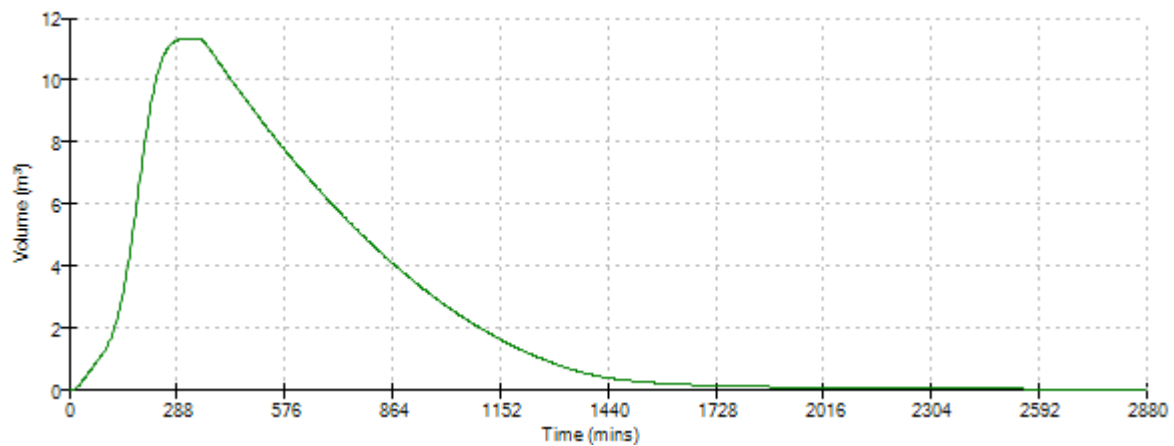
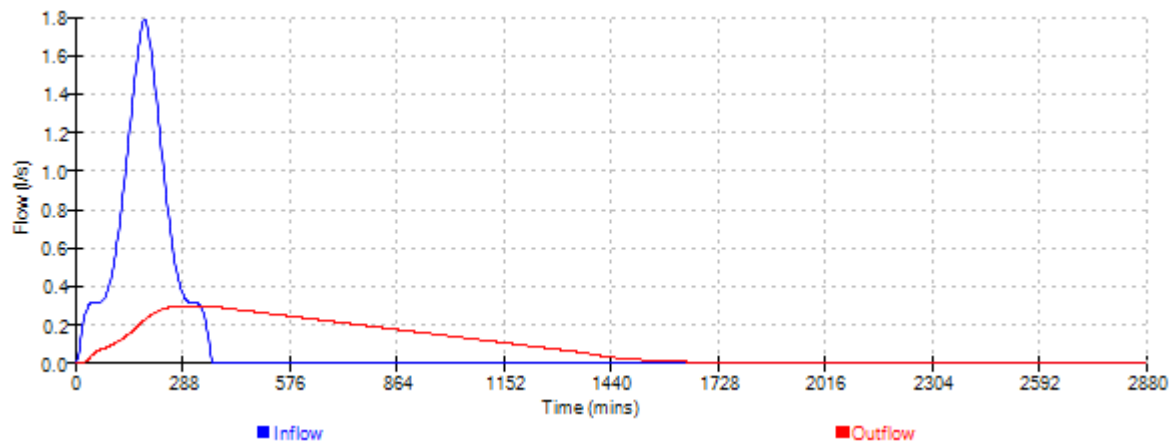
Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	29.0	29.0	0.500	0.0	42.2
0.400	29.0	42.2			

Orifice Outflow Control

Diameter (m) 0.015 Discharge Coefficient 0.600 Invert Level (m) 63.250

Dixon Hurst Kemp		Page 5
Victoria Court 22 St Pancras West Sussex PO19 7GD	Twinham 34 Hurst Road Hass...	
	Surface Water Drainage Attenuation Tank Design Rev01	
	Designed by JS	
Date Sept 25	Checked by	
File ATTENUATION TANK REV0...	Source Control w.12.6	
Elstree Computing Ltd		

Event: 360 min Winter



Dixon Hurst Kemp				Page 1	
Victoria Court 22 St Pancras West Sussex PO19 7GD		Hurst Road, Hassocks Surface Water Drainage Rain Garden Design			
Date SEPT 25		Designed by JS			
File RAIN GARDEN STORAGE D...		Checked by			
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<u>Summary of Results for 1 year Return Period (+45%)</u>					
Half Drain Time : 44 minutes.					
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	63.236	0.036	0.0	0.1	O K
30 min Summer	63.245	0.045	0.0	0.1	O K
60 min Summer	63.251	0.051	0.0	0.1	O K
120 min Summer	63.254	0.054	0.0	0.1	O K
180 min Summer	63.253	0.053	0.0	0.1	O K
240 min Summer	63.251	0.051	0.0	0.1	O K
360 min Summer	63.247	0.047	0.0	0.1	O K
480 min Summer	63.244	0.044	0.0	0.1	O K
600 min Summer	63.241	0.041	0.0	0.1	O K
720 min Summer	63.238	0.038	0.0	0.1	O K
960 min Summer	63.234	0.034	0.0	0.1	O K
1440 min Summer	63.228	0.028	0.0	0.1	O K
2160 min Summer	63.223	0.023	0.0	0.1	O K
2880 min Summer	63.219	0.019	0.0	0.0	O K
4320 min Summer	63.215	0.015	0.0	0.0	O K
5760 min Summer	63.213	0.013	0.0	0.0	O K
7200 min Summer	63.211	0.011	0.0	0.0	O K
8640 min Summer	63.210	0.010	0.0	0.0	O K
10080 min Summer	63.209	0.009	0.0	0.0	O K
15 min Winter	63.236	0.036	0.0	0.1	O K
30 min Winter	63.245	0.045	0.0	0.1	O K
60 min Winter	63.250	0.050	0.0	0.1	O K
120 min Winter	63.251	0.051	0.0	0.1	O K
Storm Event		Rain (mm/hr)	Time-Peak (mins)		
15 min Summer		42.908	22		
30 min Summer		28.573	32		
60 min Summer		18.560	50		
120 min Summer		11.840	84		
180 min Summer		9.068	116		
240 min Summer		7.491	148		
360 min Summer		5.668	212		
480 min Summer		4.650	274		
600 min Summer		3.989	336		
720 min Summer		3.519	398		
960 min Summer		2.888	520		
1440 min Summer		2.188	760		
2160 min Summer		1.654	1124		
2880 min Summer		1.357	1480		
4320 min Summer		1.028	2208		
5760 min Summer		0.845	2936		
7200 min Summer		0.723	3664		
8640 min Summer		0.637	4400		
10080 min Summer		0.572	5136		
15 min Winter		42.908	22		
30 min Winter		28.573	32		
60 min Winter		18.560	52		
120 min Winter		11.840	88		
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Dixon Hurst Kemp		Page 2
Victoria Court 22 St Pancras West Sussex PO19 7GD	Hurst Road, Hassocks Surface Water Drainage Rain Garden Design	
Date SEPT 25	Designed by JS	
File RAIN GARDEN STORAGE D...	Checked by	
Elstree Computing Ltd	Source Control w.12.6	

Summary of Results for 1 year Return Period (+45%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
180 min Winter	63.249	0.049	0.0	0.1	0 K
240 min Winter	63.246	0.046	0.0	0.1	0 K
360 min Winter	63.241	0.041	0.0	0.1	0 K
480 min Winter	63.237	0.037	0.0	0.1	0 K
600 min Winter	63.233	0.033	0.0	0.1	0 K
720 min Winter	63.230	0.030	0.0	0.1	0 K
960 min Winter	63.226	0.026	0.0	0.1	0 K
1440 min Winter	63.221	0.021	0.0	0.1	0 K
2160 min Winter	63.216	0.016	0.0	0.0	0 K
2880 min Winter	63.213	0.013	0.0	0.0	0 K
4320 min Winter	63.210	0.010	0.0	0.0	0 K
5760 min Winter	63.208	0.008	0.0	0.0	0 K
7200 min Winter	63.207	0.007	0.0	0.0	0 K
8640 min Winter	63.206	0.006	0.0	0.0	0 K
10080 min Winter	63.206	0.006	0.0	0.0	0 K

Storm Event	Rain (mm/hr)	Time-Peak (mins)
180 min Winter	9.068	122
240 min Winter	7.491	156
360 min Winter	5.668	222
480 min Winter	4.650	284
600 min Winter	3.989	346
720 min Winter	3.519	410
960 min Winter	2.888	534
1440 min Winter	2.188	768
2160 min Winter	1.654	1148
2880 min Winter	1.357	1480
4320 min Winter	1.028	2188
5760 min Winter	0.845	2952
7200 min Winter	0.723	3640
8640 min Winter	0.637	4416
10080 min Winter	0.572	5112

Dixon Hurst Kemp		Page 3
Victoria Court 22 St Pancras West Sussex PO19 7GD	Hurst Road, Hassocks Surface Water Drainage Rain Garden Design	
Date SEPT 25	Designed by JS	
File RAIN GARDEN STORAGE D...	Checked by	
Elstree Computing Ltd	Source Control w.12.6	

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	1	Cv (Summer)	1.000
Region	England and Wales	Cv (Winter)	1.000
M5-60 (mm)	20.000	Shortest Storm (mins)	15
Ratio R	0.348	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+45

Time / Area Diagram

Total Area (ha) 0.001

Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.000	4-8	0.000	8-12	0.000

Dixon Hurst Kemp		Page 4
Victoria Court 22 St Pancras West Sussex PO19 7GD	Hurst Road, Hassocks Surface Water Drainage Rain Garden Design	
Date SEPT 25	Designed by JS	
File RAIN GARDEN STORAGE D...	Checked by	
Elstree Computing Ltd	Source Control w.12.6	

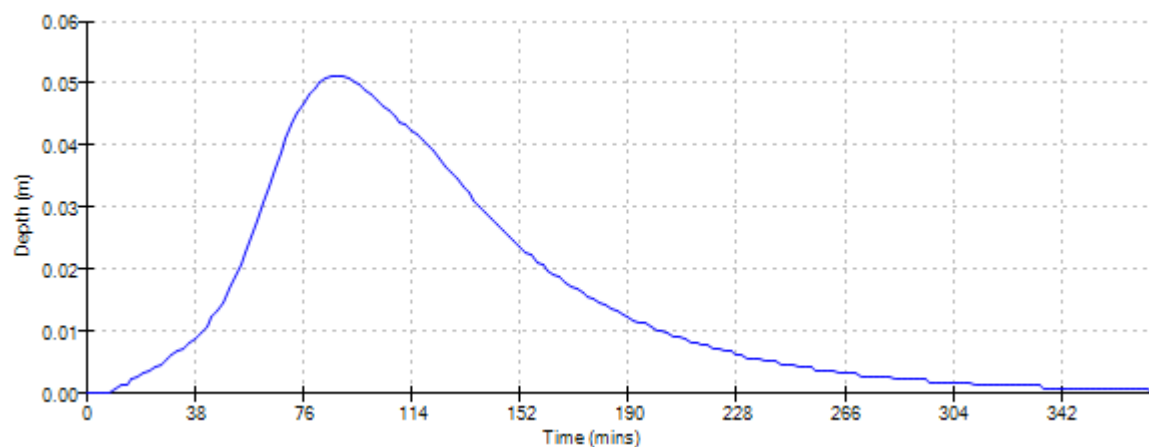
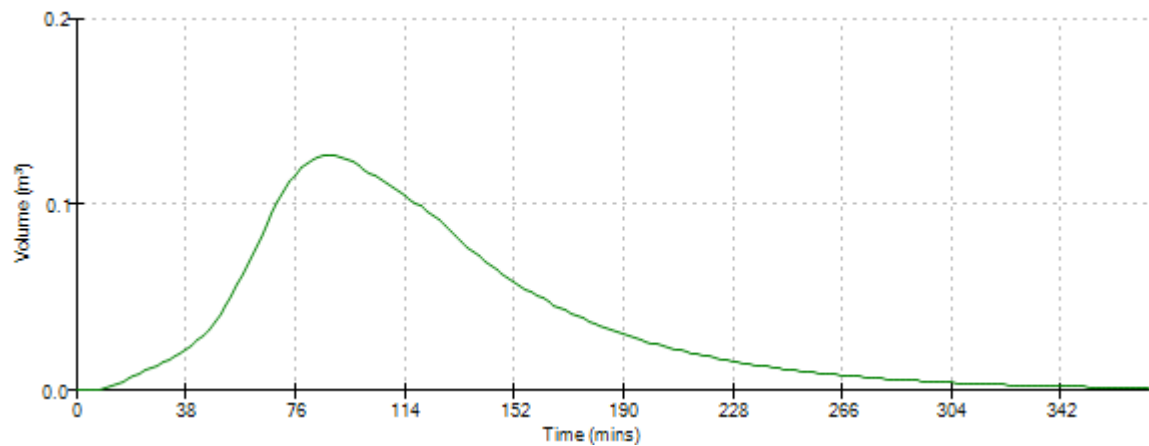
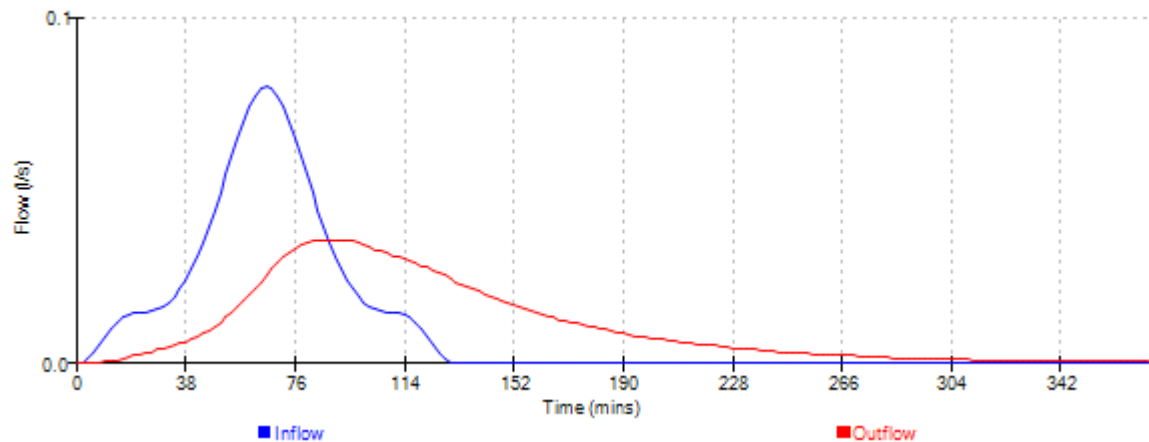
Model Details

Storage is Online Cover Level (m) 63.700

Infiltration Blanket Structure

Infiltration Coefficient Base (m/hr)	0.03100	Diameter/Width (m)	1.1
Safety Factor	2.0	Length (m)	7.5
Porosity	0.30	Cap Volume Depth (m)	0.000
Invert Level (m)	63.200		

Event: 120 min Winter



Dixon Hurst Kemp			Page 1		
Victoria Court 22 St Pancras West Sussex PO19 7GD		Hurst Road, Hassocks Surface Water Drainage Rain Garden Design			
Date SEPT 25		Designed by JS			
File RAIN GARDEN STORAGE D...		Checked by			
Elstree Computing Ltd		Source Control w.12.6			
Summary of Results for 30 year Return Period (+45%)					
Half Drain Time : 98 minutes.					
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	63.293	0.093	0.0	0.2	O K
30 min Summer	63.320	0.120	0.0	0.3	O K
60 min Summer	63.343	0.143	0.0	0.4	O K
120 min Summer	63.352	0.152	0.0	0.4	O K
180 min Summer	63.352	0.152	0.0	0.4	O K
240 min Summer	63.349	0.149	0.0	0.4	O K
360 min Summer	63.339	0.139	0.0	0.3	O K
480 min Summer	63.328	0.128	0.0	0.3	O K
600 min Summer	63.316	0.116	0.0	0.3	O K
720 min Summer	63.306	0.106	0.0	0.3	O K
960 min Summer	63.287	0.087	0.0	0.2	O K
1440 min Summer	63.260	0.060	0.0	0.1	O K
2160 min Summer	63.244	0.044	0.0	0.1	O K
2880 min Summer	63.237	0.037	0.0	0.1	O K
4320 min Summer	63.228	0.028	0.0	0.1	O K
5760 min Summer	63.223	0.023	0.0	0.1	O K
7200 min Summer	63.219	0.019	0.0	0.0	O K
8640 min Summer	63.217	0.017	0.0	0.0	O K
10080 min Summer	63.215	0.015	0.0	0.0	O K
15 min Winter	63.293	0.093	0.0	0.2	O K
30 min Winter	63.320	0.120	0.0	0.3	O K
60 min Winter	63.343	0.143	0.0	0.4	O K
120 min Winter	63.351	0.151	0.0	0.4	O K
Storm Event	Rain (mm/hr)		Time-Peak (mins)		
15 min Summer	105.185		23		
30 min Summer	70.056		36		
60 min Summer	44.676		62		
120 min Summer	27.629		102		
180 min Summer	20.607		134		
240 min Summer	16.658		168		
360 min Summer	12.345		238		
480 min Summer	9.967		304		
600 min Summer	8.436		370		
720 min Summer	7.359		434		
960 min Summer	5.929		554		
1440 min Summer	4.365		780		
2160 min Summer	3.210		1124		
2880 min Summer	2.578		1480		
4320 min Summer	1.891		2208		
5760 min Summer	1.516		2936		
7200 min Summer	1.279		3672		
8640 min Summer	1.112		4408		
10080 min Summer	0.989		5128		
15 min Winter	105.185		23		
30 min Winter	70.056		36		
60 min Winter	44.676		62		
120 min Winter	27.629		106		
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Dixon Hurst Kemp		Page 2
Victoria Court 22 St Pancras West Sussex PO19 7GD	Hurst Road, Hassocks Surface Water Drainage Rain Garden Design	
Date SEPT 25	Designed by JS	
File RAIN GARDEN STORAGE D...	Checked by	
Elstree Computing Ltd	Source Control w.12.6	

Summary of Results for 30 year Return Period (+45%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
180 min Winter	63.349	0.149	0.0	0.4	0 K
240 min Winter	63.342	0.142	0.0	0.4	0 K
360 min Winter	63.326	0.126	0.0	0.3	0 K
480 min Winter	63.309	0.109	0.0	0.3	0 K
600 min Winter	63.292	0.092	0.0	0.2	0 K
720 min Winter	63.277	0.077	0.0	0.2	0 K
960 min Winter	63.255	0.055	0.0	0.1	0 K
1440 min Winter	63.241	0.041	0.0	0.1	0 K
2160 min Winter	63.231	0.031	0.0	0.1	0 K
2880 min Winter	63.225	0.025	0.0	0.1	0 K
4320 min Winter	63.219	0.019	0.0	0.0	0 K
5760 min Winter	63.215	0.015	0.0	0.0	0 K
7200 min Winter	63.213	0.013	0.0	0.0	0 K
8640 min Winter	63.211	0.011	0.0	0.0	0 K
10080 min Winter	63.210	0.010	0.0	0.0	0 K

Storm Event	Rain (mm/hr)	Time-Peak (mins)
180 min Winter	20.607	142
240 min Winter	16.658	180
360 min Winter	12.345	252
480 min Winter	9.967	320
600 min Winter	8.436	384
720 min Winter	7.359	444
960 min Winter	5.929	548
1440 min Winter	4.365	776
2160 min Winter	3.210	1136
2880 min Winter	2.578	1476
4320 min Winter	1.891	2204
5760 min Winter	1.516	2952
7200 min Winter	1.279	3584
8640 min Winter	1.112	4320
10080 min Winter	0.989	5144

Dixon Hurst Kemp		Page 3
Victoria Court 22 St Pancras West Sussex PO19 7GD	Hurst Road, Hassocks Surface Water Drainage Rain Garden Design	
Date SEPT 25	Designed by JS	
File RAIN GARDEN STORAGE D...	Checked by	
Elstree Computing Ltd	Source Control w.12.6	

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	30	Cv (Summer)	1.000
Region	England and Wales	Cv (Winter)	1.000
M5-60 (mm)	20.000	Shortest Storm (mins)	15
Ratio R	0.348	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+45

Time / Area Diagram

Total Area (ha) 0.001

Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.000	4-8	0.000	8-12	0.000

Dixon Hurst Kemp		Page 4
Victoria Court 22 St Pancras West Sussex PO19 7GD	Hurst Road, Hassocks Surface Water Drainage Rain Garden Design	
Date SEPT 25	Designed by JS	
File RAIN GARDEN STORAGE D...	Checked by	
Elstree Computing Ltd	Source Control w.12.6	

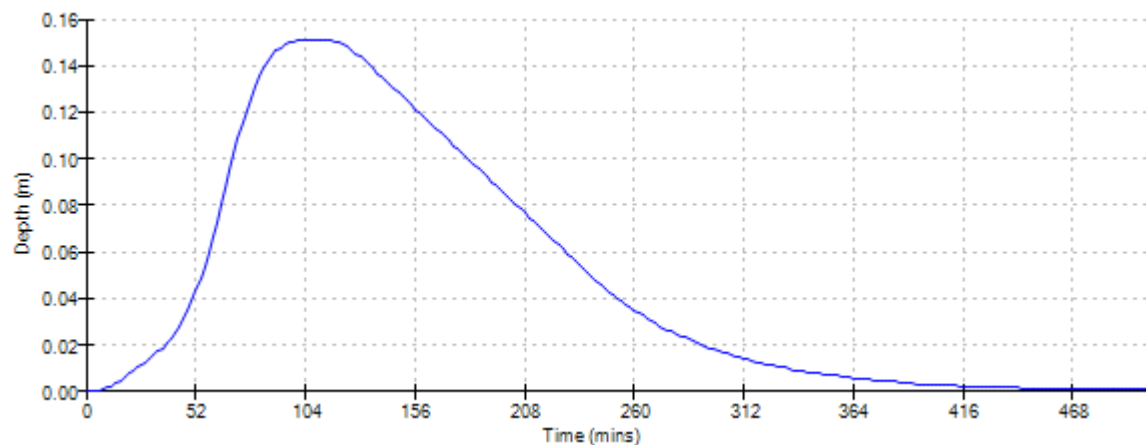
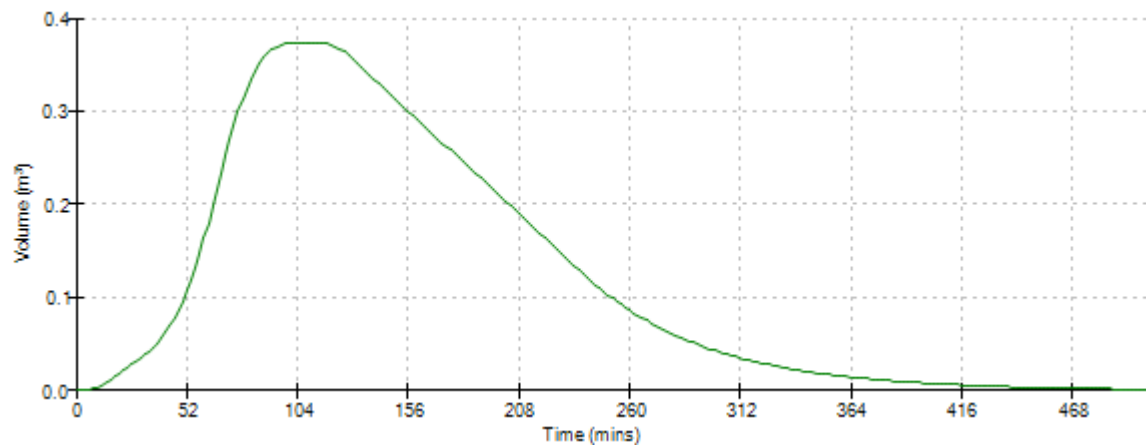
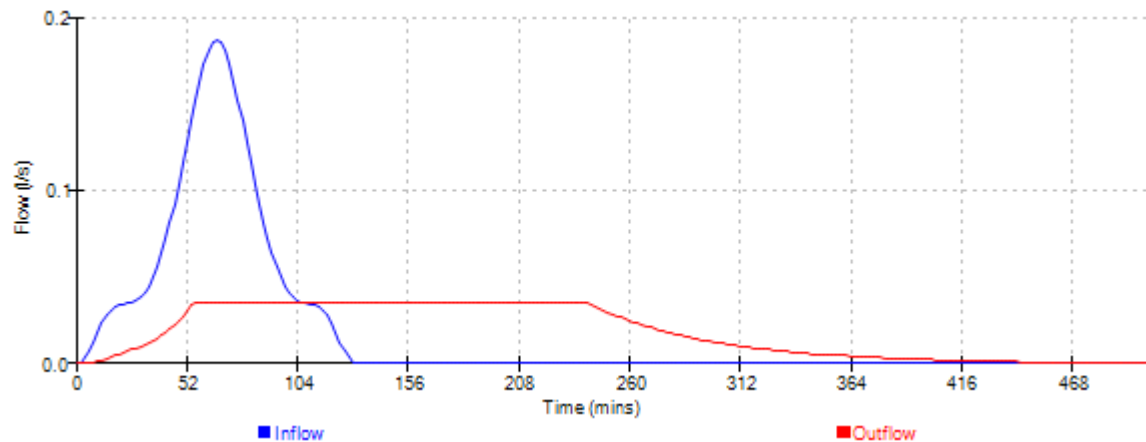
Model Details

Storage is Online Cover Level (m) 63.700

Infiltration Blanket Structure

Infiltration Coefficient Base (m/hr)	0.03100	Diameter/Width (m)	1.1
Safety Factor	2.0	Length (m)	7.5
Porosity	0.30	Cap Volume Depth (m)	0.000
Invert Level (m)	63.200		

Event: 120 min Winter



Dixon Hurst Kemp		Page 1
Victoria Court 22 St Pancras West Sussex PO19 7GD	Hurst Road, Hassocks Surface Water Drainage Rain Garden Design	
Date SEPT 25	Designed by JS	
File RAIN GARDEN STORAGE D...	Checked by	
Elstree Computing Ltd	Source Control w.12.6	

Summary of Results for 100 year Return Period (+45%)

Half Drain Time : 136 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	63.323	0.123	0.0	0.3	O K
30 min Summer	63.362	0.162	0.0	0.4	O K
60 min Summer	63.396	0.196	0.0	0.5	O K
120 min Summer	63.415	0.215	0.0	0.5	O K
180 min Summer	63.415	0.215	0.0	0.5	O K
240 min Summer	63.411	0.211	0.0	0.5	O K
360 min Summer	63.400	0.200	0.0	0.5	O K
480 min Summer	63.387	0.187	0.0	0.5	O K
600 min Summer	63.374	0.174	0.0	0.4	O K
720 min Summer	63.361	0.161	0.0	0.4	O K
960 min Summer	63.336	0.136	0.0	0.3	O K
1440 min Summer	63.296	0.096	0.0	0.2	O K
2160 min Summer	63.258	0.058	0.0	0.1	O K
2880 min Summer	63.245	0.045	0.0	0.1	O K
4320 min Summer	63.234	0.034	0.0	0.1	O K
5760 min Summer	63.228	0.028	0.0	0.1	O K
7200 min Summer	63.223	0.023	0.0	0.1	O K
8640 min Summer	63.220	0.020	0.0	0.1	O K
10080 min Summer	63.218	0.018	0.0	0.0	O K
15 min Winter	63.323	0.123	0.0	0.3	O K
30 min Winter	63.362	0.162	0.0	0.4	O K
60 min Winter	63.397	0.197	0.0	0.5	O K
120 min Winter	63.415	0.215	0.0	0.5	O K

Storm Event	Rain (mm/hr)	Time-Peak (mins)
15 min Summer	136.286	24
30 min Summer	91.635	37
60 min Summer	58.739	64
120 min Summer	36.288	118
180 min Summer	26.937	148
240 min Summer	21.660	180
360 min Summer	15.950	248
480 min Summer	12.815	316
600 min Summer	10.804	384
720 min Summer	9.393	448
960 min Summer	7.524	578
1440 min Summer	5.493	816
2160 min Summer	4.002	1148
2880 min Summer	3.192	1480
4320 min Summer	2.316	2208
5760 min Summer	1.843	2936
7200 min Summer	1.545	3672
8640 min Summer	1.338	4408
10080 min Summer	1.184	5112
15 min Winter	136.286	24
30 min Winter	91.635	37
60 min Winter	58.739	64
120 min Winter	36.288	118

Dixon Hurst Kemp		Page 2
Victoria Court 22 St Pancras West Sussex PO19 7GD	Hurst Road, Hassocks Surface Water Drainage Rain Garden Design	
Date SEPT 25	Designed by JS	
File RAIN GARDEN STORAGE D...	Checked by	
Elstree Computing Ltd	Source Control w.12.6	

Summary of Results for 100 year Return Period (+45%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
180 min Winter	63.413	0.213	0.0	0.5	0 K
240 min Winter	63.407	0.207	0.0	0.5	0 K
360 min Winter	63.390	0.190	0.0	0.5	0 K
480 min Winter	63.370	0.170	0.0	0.4	0 K
600 min Winter	63.350	0.150	0.0	0.4	0 K
720 min Winter	63.331	0.131	0.0	0.3	0 K
960 min Winter	63.297	0.097	0.0	0.2	0 K
1440 min Winter	63.252	0.052	0.0	0.1	0 K
2160 min Winter	63.238	0.038	0.0	0.1	0 K
2880 min Winter	63.231	0.031	0.0	0.1	0 K
4320 min Winter	63.223	0.023	0.0	0.1	0 K
5760 min Winter	63.218	0.018	0.0	0.0	0 K
7200 min Winter	63.215	0.015	0.0	0.0	0 K
8640 min Winter	63.213	0.013	0.0	0.0	0 K
10080 min Winter	63.212	0.012	0.0	0.0	0 K

Storm Event	Rain (mm/hr)	Time-Peak (mins)
180 min Winter	26.937	152
240 min Winter	21.660	188
360 min Winter	15.950	264
480 min Winter	12.815	336
600 min Winter	10.804	406
720 min Winter	9.393	472
960 min Winter	7.524	594
1440 min Winter	5.493	788
2160 min Winter	4.002	1144
2880 min Winter	3.192	1484
4320 min Winter	2.316	2208
5760 min Winter	1.843	2872
7200 min Winter	1.545	3672
8640 min Winter	1.338	4376
10080 min Winter	1.184	4992

Dixon Hurst Kemp		Page 3
Victoria Court 22 St Pancras West Sussex PO19 7GD	Hurst Road, Hassocks Surface Water Drainage Rain Garden Design	
Date SEPT 25	Designed by JS	
File RAIN GARDEN STORAGE D...	Checked by	
Elstree Computing Ltd	Source Control w.12.6	

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	1.000
Region	England and Wales	Cv (Winter)	1.000
M5-60 (mm)	20.000	Shortest Storm (mins)	15
Ratio R	0.348	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+45

Time / Area Diagram

Total Area (ha) 0.001

Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.000	4-8	0.000	8-12	0.000

Dixon Hurst Kemp		Page 4
Victoria Court 22 St Pancras West Sussex PO19 7GD	Hurst Road, Hassocks Surface Water Drainage Rain Garden Design	
Date SEPT 25	Designed by JS	
File RAIN GARDEN STORAGE D...	Checked by	
Elstree Computing Ltd	Source Control w.12.6	

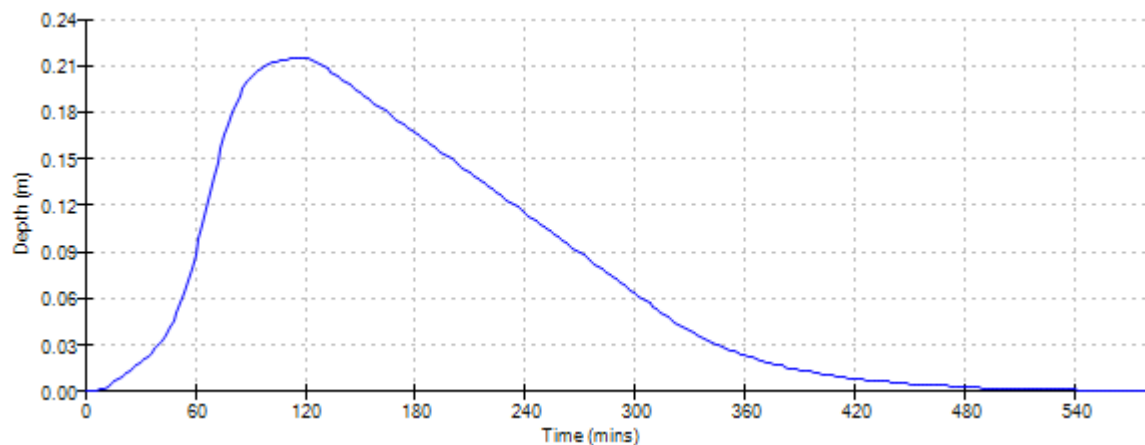
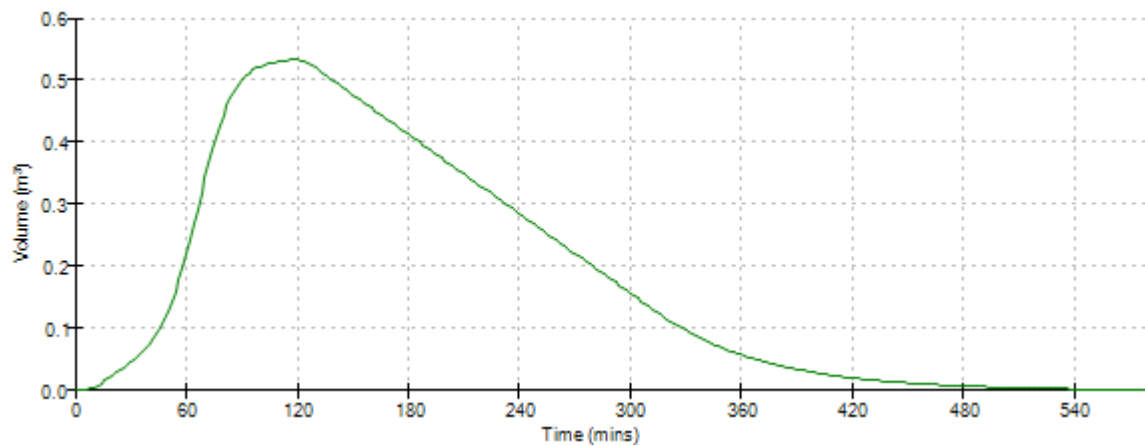
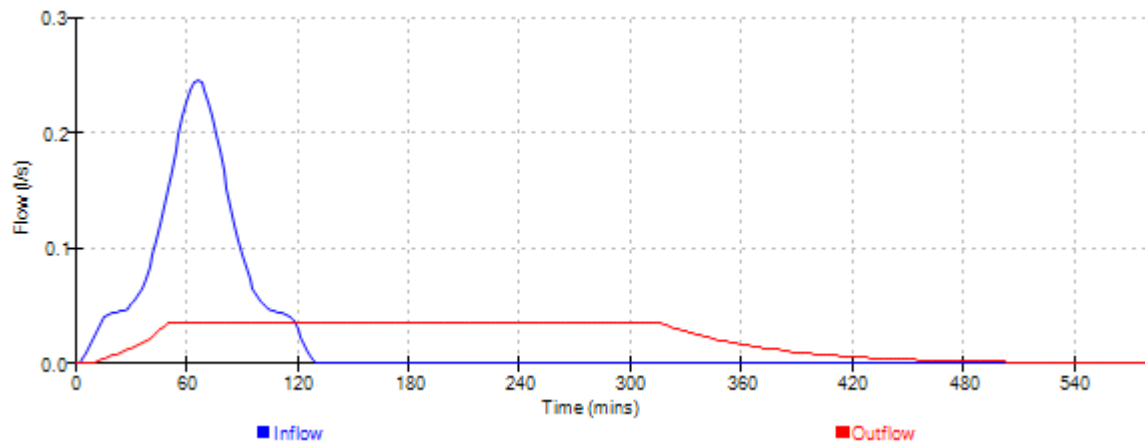
Model Details

Storage is Online Cover Level (m) 63.700

Infiltration Blanket Structure

Infiltration Coefficient Base (m/hr)	0.03100	Diameter/Width (m)	1.1
Safety Factor	2.0	Length (m)	7.5
Porosity	0.30	Cap Volume Depth (m)	0.000
Invert Level (m)	63.200		

Event: 120 min Winter



Dixon Hurst Kemp		Page 1
Victoria Court 22 St Pancras West Sussex PO19 7GD	34 Hurst Road. Hassocks Surface Water Drainage Design Simulation	
Date SEPT 25	Designed by JS	
File Rain Garden.MDX	Checked by	
Elstree Computing Ltd	Network W.12.6	

Existing Network Details for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	k (mm)	HYD SECT	DIA (mm)	
1.000	3.600	0.360	10.0	0.004	5.00	0.600	o	110	
1.001	9.200	1.150	8.0	0.004	0.00	0.600	o	110	
1.002	11.200	0.600	18.7	0.000	0.00	0.600	o	110	
2.000	16.200	1.620	10.0	0.004	5.00	0.600	o	110	
2.001	5.000	0.250	20.0	0.004	0.00	0.600	o	110	
1.003	1.700	0.017	100.0	0.000	0.00	0.600	o	110	
1.004	1.000	0.010	100.0	0.000	0.00	0.600	o	110	
PN	US/MH Name	US/CL (m)	US/IL (m)	US C.Depth (m)	DS/CL (m)	DS/IL (m)	DS C.Depth (m)	Ctrl	US/MH (mm)
1.000	RE1	66.000	65.400	0.490	65.650	65.040	0.500		110
1.001	S1	65.650	65.000	0.540	64.100	63.850	0.140		450
1.002	S2	64.100	63.850	0.140	64.000	63.250	0.640		600
2.000	RE2	66.000	65.400	0.490	64.100	63.780	0.210		110
2.001	S3	64.100	63.500	0.490	64.000	63.250	0.640		600
1.003	S4	64.000	63.250	0.640	64.000	63.233	0.657	Orifice	600
1.004	Rain Garden	64.000	63.233	0.657	63.700	63.223	0.367	Orifice 7500 x 1100	

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)
1.004	Dummy	63.700	63.223	63.230	450	450

Simulation Criteria for Storm

Volumetric Runoff Coeff	1.000	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	45.000
Hot Start (mins)	0	MADD Factor * 10m ³ /ha Storage	2.000
Hot Start Level (mm)	0	Run Time (mins)	60
Manhole Headloss Coeff (Global)	0.500	Output Interval (mins)	1
Number of Input Hydrographs	0	Number of Storage Structures	2
Number of Online Controls	2	Number of Time/Area Diagrams	0
Number of Offline Controls	0		

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	1	Cv (Summer)	1.000
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	20.000	Storm Duration (mins)	30
Ratio R	0.343		

Dixon Hurst Kemp		Page 2
Victoria Court 22 St Pancras West Sussex PO19 7GD	34 Hurst Road. Hassocks Surface Water Drainage Design Simulation	
Date SEPT 25	Designed by JS	
File Rain Garden.MDX	Checked by	
Elstree Computing Ltd	Network W.12.6	

Online Controls for Storm

Orifice Manhole: S4, DS/PN: 1.003, Volume (m³): 0.4

Diameter (m) 0.017 Discharge Coefficient 0.600 Invert Level (m) 63.250

Orifice Manhole: Rain Garden, DS/PN: 1.004, Volume (m³): 6.3

Diameter (m) 0.008 Discharge Coefficient 0.600 Invert Level (m) 63.233

Dixon Hurst Kemp		Page 3
Victoria Court 22 St Pancras West Sussex PO19 7GD	34 Hurst Road. Hassocks Surface Water Drainage Design Simulation	
Date SEPT 25	Designed by JS	
File Rain Garden.MDX	Checked by	
Elstree Computing Ltd	Network W.12.6	

Storage Structures for Storm

cellular Storage Manhole: S4, DS/PN: 1.003

Invert Level (m) 63.150 Safety Factor 2.0
 Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
 Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	21.8	21.8	0.500	0.0	34.6
0.400	21.8	34.6			

Infiltration Blanket Manhole: Rain Garden, DS/PN: 1.004

Infiltration Coefficient Base (m/hr) 0.03100 Diameter/Width (m) 1.1
 Safety Factor 2.0 Length (m) 7.5
 Porosity 0.30 Cap Volume Depth (m) 0.000
 Invert Level (m) 63.500

Manhole Headloss for Storm

PN	US/MH Name	US/MH Headloss
1.000	RE1	0.500
1.001	S1	0.500
1.002	S2	0.500
2.000	RE2	0.500
2.001	S3	0.500
1.003	S4	0.500
1.004	Rain Garden	0.500

Dixon Hurst Kemp		Page 4
Victoria Court 22 St Pancras West Sussex PO19 7GD	34 Hurst Road. Hassocks Surface Water Drainage Design Simulation	
Date SEPT 25	Designed by JS	
File Rain Garden.MDX	Checked by	
Elstree Computing Ltd	Network W.12.6	

Summary of Results for 30 minute 1 year Summer (Storm)

Margin for Flood Risk Warning (mm) 150.0 DVD Status OFF
 Analysis Timestep Fine Inertia Status OFF
 DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	RE1	65.415	-0.095	0.000	0.04	0.0	0.9	OK
1.001	S1	65.018	-0.092	0.000	0.07	0.0	1.7	OK
1.002	S2	63.873	-0.087	0.000	0.10	0.0	1.7	OK
2.000	RE2	65.414	-0.096	0.000	0.04	0.0	0.9	OK
2.001	S3	63.524	-0.086	0.000	0.11	0.0	1.7	OK
1.003	S4	63.259	-0.101	0.000	0.00	0.0	0.0	OK
1.004	Rain Garden	63.240	-0.103	0.000	0.00	0.0	0.0	OK

Dixon Hurst Kemp		Page 1
Victoria Court 22 St Pancras West Sussex PO19 7GD	34 Hurst Road. Hassocks Surface Water Drainage Design Simulation	
Date SEPT 25	Designed by JS	
File Rain Garden.MDX	Checked by	
Elstree Computing Ltd	Network W.12.6	

Existing Network Details for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	k (mm)	HYD SECT	DIA (mm)	
1.000	3.600	0.360	10.0	0.004	5.00	0.600	o	110	
1.001	9.200	1.150	8.0	0.004	0.00	0.600	o	110	
1.002	11.200	0.600	18.7	0.000	0.00	0.600	o	110	
2.000	16.200	1.620	10.0	0.004	5.00	0.600	o	110	
2.001	5.000	0.250	20.0	0.004	0.00	0.600	o	110	
1.003	1.700	0.017	100.0	0.000	0.00	0.600	o	110	
1.004	1.000	0.010	100.0	0.000	0.00	0.600	o	110	
PN	US/MH Name	US/CL (m)	US/IL (m)	US C.Depth (m)	DS/CL (m)	DS/IL (m)	DS C.Depth (m)	Ctrl	US/MH (mm)
1.000	RE1	66.000	65.400	0.490	65.650	65.040	0.500		110
1.001	S1	65.650	65.000	0.540	64.100	63.850	0.140		450
1.002	S2	64.100	63.850	0.140	64.000	63.250	0.640		600
2.000	RE2	66.000	65.400	0.490	64.100	63.780	0.210		110
2.001	S3	64.100	63.500	0.490	64.000	63.250	0.640		600
1.003	S4	64.000	63.250	0.640	64.000	63.233	0.657	Orifice	600
1.004	Rain Garden	64.000	63.233	0.657	63.700	63.223	0.367	Orifice 7500 x 1100	

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)
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1.004	Dummy	63.700	63.223	63.230	450	450
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Simulation Criteria for Storm

Volumetric Runoff Coeff	1.000	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	45.000
Hot Start (mins)	0	MADD Factor * 10m ³ /ha Storage	2.000
Hot Start Level (mm)	0	Run Time (mins)	60
Manhole Headloss Coeff (Global)	0.500	Output Interval (mins)	1

Number of Input Hydrographs	0	Number of Storage Structures	2
Number of Online Controls	2	Number of Time/Area Diagrams	0
Number of Offline Controls	0		

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	30	Cv (Summer)	1.000
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	20.000	Storm Duration (mins)	30
Ratio R	0.343		

Dixon Hurst Kemp		Page 2
Victoria Court 22 St Pancras West Sussex PO19 7GD	34 Hurst Road. Hassocks Surface Water Drainage Design Simulation	
Date SEPT 25	Designed by JS	
File Rain Garden.MDX	Checked by	
Elstree Computing Ltd	Network W.12.6	

Online Controls for Storm

Orifice Manhole: S4, DS/PN: 1.003, Volume (m³): 0.4

Diameter (m) 0.017 Discharge Coefficient 0.600 Invert Level (m) 63.250

Orifice Manhole: Rain Garden, DS/PN: 1.004, Volume (m³): 6.3

Diameter (m) 0.008 Discharge Coefficient 0.600 Invert Level (m) 63.233

Dixon Hurst Kemp		Page 3
Victoria Court 22 St Pancras West Sussex PO19 7GD	34 Hurst Road. Hassocks Surface Water Drainage Design Simulation	
Date SEPT 25	Designed by JS	
File Rain Garden.MDX	Checked by	
Elstree Computing Ltd	Network W.12.6	

Storage Structures for Storm

cellular Storage Manhole: S4, DS/PN: 1.003

Invert Level (m) 63.150 Safety Factor 2.0
 Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
 Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	21.8	21.8	0.500	0.0	34.6
0.400	21.8	34.6			

Infiltration Blanket Manhole: Rain Garden, DS/PN: 1.004

Infiltration Coefficient Base (m/hr) 0.03100 Diameter/Width (m) 1.1
 Safety Factor 2.0 Length (m) 7.5
 Porosity 0.30 Cap Volume Depth (m) 0.000
 Invert Level (m) 63.500

Manhole Headloss for Storm

PN	US/MH Name	US/MH Headloss
1.000	RE1	0.500
1.001	S1	0.500
1.002	S2	0.500
2.000	RE2	0.500
2.001	S3	0.500
1.003	S4	0.500
1.004	Rain Garden	0.500

Dixon Hurst Kemp		Page 4
Victoria Court 22 St Pancras West Sussex PO19 7GD	34 Hurst Road. Hassocks Surface Water Drainage Design Simulation	
Date SEPT 25	Designed by JS	
File Rain Garden.MDX	Checked by	
Elstree Computing Ltd	Network W.12.6	

Summary of Results for 30 minute 30 year Summer (Storm)

Margin for Flood Risk Warning (mm) 150.0 DVD Status OFF
 Analysis Timestep Fine Inertia Status OFF
 DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	RE1	65.424	-0.086	0.000	0.11	0.0	2.2	OK
1.001	S1	65.031	-0.079	0.000	0.18	0.0	4.5	OK
1.002	S2	63.889	-0.071	0.000	0.27	0.0	4.5	OK
2.000	RE2	65.423	-0.087	0.000	0.09	0.0	2.2	OK
2.001	S3	63.541	-0.069	0.000	0.30	0.0	4.5	OK
1.003	S4	63.408	0.048	0.000	0.04	0.0	0.2	SURCHARGED
1.004	Rain Garden	63.275	-0.068	0.000	0.00	0.0	0.0	OK

Dixon Hurst Kemp		Page 1
Victoria Court 22 St Pancras West Sussex PO19 7GD	34 Hurst Road. Hassocks Surface Water Drainage Design Simulation	
Date SEPT 25	Designed by JS	
File Surface Water Drainag...	Checked by	
Elstree Computing Ltd	Network W.12.6	

Existing Network Details for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	k (mm)	HYD SECT	DIA (mm)	
1.000	3.600	0.360	10.0	0.004	5.00	0.600	o	110	
1.001	9.200	1.150	8.0	0.004	0.00	0.600	o	110	
1.002	11.200	0.600	18.7	0.000	0.00	0.600	o	110	
2.000	16.200	1.620	10.0	0.004	5.00	0.600	o	110	
2.001	5.000	0.250	20.0	0.004	0.00	0.600	o	110	
1.003	1.700	0.017	100.0	0.000	0.00	0.600	o	110	
1.004	1.000	0.010	100.0	0.000	0.00	0.600	o	110	
PN	US/MH Name	US/CL (m)	US/IL (m)	US C.Depth (m)	DS/CL (m)	DS/IL (m)	DS C.Depth (m)	Ctrl	US/MH (mm)
1.000	RE1	66.000	65.400	0.490	65.650	65.040	0.500		110
1.001	S1	65.650	65.000	0.540	64.100	63.850	0.140		450
1.002	S2	64.100	63.850	0.140	64.000	63.250	0.640		600
2.000	RE2	66.000	65.400	0.490	64.100	63.780	0.210		110
2.001	S3	64.100	63.500	0.490	64.000	63.250	0.640		600
1.003	S4	64.000	63.250	0.640	64.000	63.233	0.657	Orifice	600
1.004	Rain Garden	64.000	63.233	0.657	63.700	63.223	0.367	Orifice 7500 x 1100	

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)
1.004	Dummy	63.700	63.223	63.230	450	450

Simulation Criteria for Storm

Volumetric Runoff Coeff	1.000	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	45.000
Hot Start (mins)	0	MADD Factor * 10m ³ /ha Storage	2.000
Hot Start Level (mm)	0	Run Time (mins)	60
Manhole Headloss Coeff (Global)	0.500	Output Interval (mins)	1
Number of Input Hydrographs	0	Number of Storage Structures	2
Number of Online Controls	2	Number of Time/Area Diagrams	0
Number of Offline Controls	0		

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	100	Cv (Summer)	1.000
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	20.000	Storm Duration (mins)	30
Ratio R	0.343		

Dixon Hurst Kemp		Page 2
Victoria Court 22 St Pancras West Sussex PO19 7GD	34 Hurst Road. Hassocks Surface Water Drainage Design Simulation	
Date SEPT 25	Designed by JS	
File Surface Water Drainag...	Checked by	
Elstree Computing Ltd	Network W.12.6	

Online Controls for Storm

Orifice Manhole: S4, DS/PN: 1.003, Volume (m³): 0.4

Diameter (m) 0.017 Discharge Coefficient 0.600 Invert Level (m) 63.250

Orifice Manhole: Rain Garden, DS/PN: 1.004, Volume (m³): 6.3

Diameter (m) 0.008 Discharge Coefficient 0.600 Invert Level (m) 63.233

Dixon Hurst Kemp		Page 3
Victoria Court 22 St Pancras West Sussex PO19 7GD	34 Hurst Road. Hassocks Surface Water Drainage Design Simulation	
Date SEPT 25	Designed by JS	
File Surface Water Drainag...	Checked by	
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Storage Structures for Storm

cellular Storage Manhole: S4, DS/PN: 1.003

Invert Level (m) 63.150 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	21.8	21.8	0.500	0.0	34.6
0.400	21.8	34.6			

Infiltration Blanket Manhole: Rain Garden, DS/PN: 1.004

Infiltration Coefficient Base (m/hr) 0.03100 Diameter/Width (m) 1.1
Safety Factor 2.0 Length (m) 7.5
Porosity 0.30 Cap Volume Depth (m) 0.000
Invert Level (m) 63.500

Manhole Headloss for Storm

PN	US/MH Name	US/MH Headloss
1.000	RE1	0.500
1.001	S1	0.500
1.002	S2	0.500
2.000	RE2	0.500
2.001	S3	0.500
1.003	S4	0.500
1.004	Rain Garden	0.500

Dixon Hurst Kemp		Page 4
Victoria Court 22 St Pancras West Sussex PO19 7GD	34 Hurst Road. Hassocks Surface Water Drainage Design Simulation	
Date SEPT 25	Designed by JS	
File Surface Water Drainag...	Checked by	
Elstree Computing Ltd	Network W.12.6	

Summary of Results for 30 minute 100 year Summer (Storm)

Margin for Flood Risk Warning (mm) 150.0 DVD Status OFF
 Analysis Timestep Fine Inertia Status OFF
 DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	RE1	65.428	-0.082	0.000	0.14	0.0	2.9	OK
1.001	S1	65.036	-0.074	0.000	0.23	0.0	5.9	OK
1.002	S2	63.895	-0.065	0.000	0.35	0.0	5.9	OK
2.000	RE2	65.425	-0.085	0.000	0.12	0.0	2.9	OK
2.001	S3	63.548	-0.062	0.000	0.39	0.0	5.9	OK
1.003	S4	63.486	0.126	0.000	0.05	0.0	0.3	SURCHARGED
1.004	Rain Garden	63.300	-0.043	0.000	0.00	0.0	0.0	OK

Dixon Hurst Kemp		Page 1
Victoria Court 22 St Pancras West Sussex PO19 7GD	34 Hurst Road, Hassocks Surface Water Drainage Greenfield Runoff Assessment	
Date Sept 25	Designed by JS	
File TRENCH DESIGN 1 IN 10...	Checked by	
Elstree Computing Ltd	Source Control w.12.6	

ICP SUDS Mean Annual Flood

Input

Return Period (years)	2	Soil	0.450
Area (ha)	0.087	Urban	0.000
SAAR (mm)	800	Region Number	Region 7

Results 1/s

QBAR Rural 0.4
QBAR Urban 0.4

Q2 years 0.4

Q1 year 0.4
Q30 years 1.0
Q100 years 1.4

**LAND ADJACENT TO TWINHAM 34 HURST ROAD, HASSOCKS,
EAST SUSSEX, BN6 9NL.
PROPOSED MAINTENANCE & INSPECTION SCHEDULE FOR BELOW GROUND DRAINAGE
(FOUL WATER AND SURFACE WATER) INCLUDING SUSTAINABLE DRAINAGE SYSTEMS (SuDS)**

Item	Required Maintenance/Monitoring	Suggested Frequency	Responsibility
Foul Water Drainage	Check inspection chambers and manholes for damage, condition and function.	Every six months	Property Owner
	Undertake a CCTV drainage survey of the drainage network to establish condition.	Every ten years	Specialist
	Replace or repair malfunctioning parts or structures	As required	Specialist
Surface Water Drainage	Check inspection chambers and manholes for damage, condition and function	Every six months	Property Owner
	Undertake a CCTV drainage survey of the drainage network to establish condition.	Every ten years	Property Owner
	Replace or repair malfunctioning parts or structures.	As required	Specialist
Gullies and Channel Drains	Check gullies and channel drains for damage, condition and function.	Every six months	Property Owner
	Remove sediment, oil/grease, litter and debris.	As necessary	Property Owner
	Replace or repair malfunctioning parts or structures.	As required	Specialist
Surface Water Soakaway	Check silt traps and inspection chambers, and note the rate of sediment accumulation.	Every month for the first year and then annually, or as conditions require	Property Owner
	Undertake a CCTV drainage survey of tanks and soakaway chambers. Note sediment build up and remove sediment/debris if present.	Every five years, or as conditions require	Specialist
Petrol Interceptor	Inspection in accordance with manufacturer's requirements.	Every six months	Specialist
	Full service and general inspection with separator system emptied.	Every 5 years	
Permeable Block Paving	Sweep clean of debris and inspect integrity of bedding grit. Replace bedding grit locally if required.	Every six months	Property Owner
	Lift blocks and remove bedding grit and replace and re-bed paving.	Full bedding replacement currently recommended by manufacturers every 20 years	Specialist
Bioretention areas	Inspect infiltration surfaces for silting and ponding, record drain down time to monitor performance.	Quarterly	Property Owner

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(FOUL WATER AND SURFACE WATER) INCLUDING SUSTAINABLE DRAINAGE SYSTEMS (SuDS)**

General	Check underdrains are free flowing and inlets/outlets are blockage free.	Quarterly	Property Owner
	Assess plants for health and invasive weed growth replace/remove as necessary.	Quarterly	Property Owner
	Remove litter and general detritus.	Quarterly and after heavy storms	Property Owner
	Remove and replace filter medium and vegetation	As required – SuDS Manual recommends every 20 years	Specialist
	Remove sediment, litter, debris and vegetation from the surface of pathways areas	As necessary and after heavy rainfall	Property Owner
Flood Flow Routes	Ensure flood flow routes are not obstructed (i.e. lower lying portions of the land that will direct surface water runoff away from vulnerable assets in the event of drainage failure).	Every six months and during periods of heavy rainfall	Property Owner

NOTES

The property owners will be responsible for the implementation of the maintenance schedule for below ground drainage or appoint appropriate persons and/or sub-consultants that are qualified to undertake these operations.

Maintenance is to be carried out by the property owners or by a specialist contractor, as noted in Responsibility column above.

This maintenance schedule has been produced with reference to the guidelines outlined in 'The SuDS Manual' (CIRIA C753: 2015). The suggested frequency of maintenance is considered a guide, and should not replace the guidance from manufacturers of proprietary systems.

Refer to Engineering drawings for location and details of below ground drainage assets and SuDS features.

B | D

BELMONT DESIGNS
ARCHITECTURAL PRACTICE

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NOTES

DO NOT SCALE OFF THIS DRAWING.

CHECK ALL DIMENSIONS ON SITE BEFORE ANY WORK IS COMMENCED.
ALL GOODS MATERIALS AND WORKMANSHIP MUST CONFORM WITH CURRENT BUILDING REGULATIONS, BRITISH STANDARDS AND CODES OF PRACTICE.

A	26/02/2025	JM	Drainage
Rev	Date	By	Amendment

Client
Mr & Mrs J Bullivant

Site Address
Land adjacent to Twinham
34 Hurst Road
Hassocks
BN6 9NL

Project
Proposed detached dwelling
with parking

Drawing Title
Site Layout Plan - Planning

Date Dec 2024	Scale 1:100@A1	Drawn By JM
Job No B.043.24	Dwg No 01	Checked By JTM
		Rev A

PROPOSED SITE LAYOUT PLAN

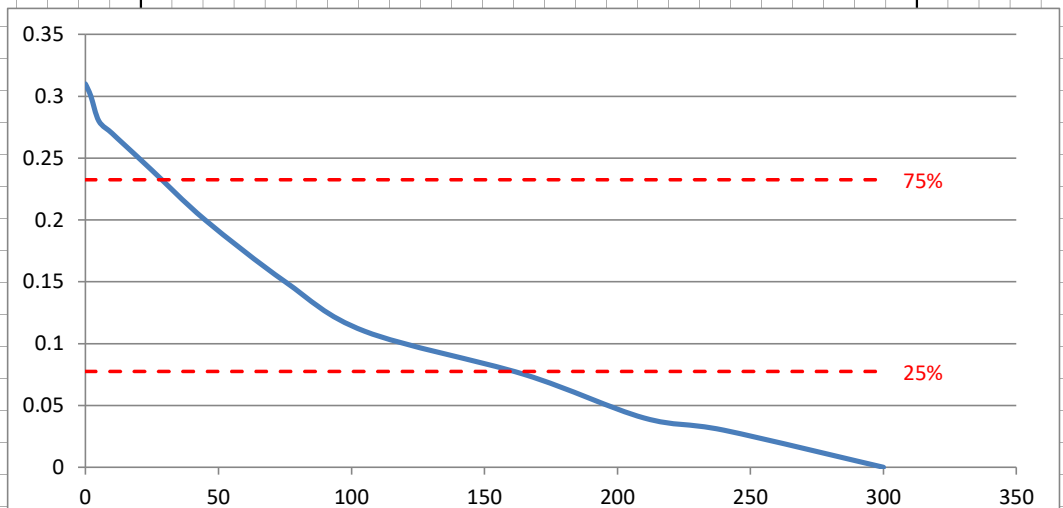


DIXON HURST CONSULTING CIVIL & STRUCTURAL ENGINEERS	Project:	Twinham, 34 Hurst Road, Lindfield			By:
	Calculation:	Soakaway Design			JS
	Infiltration Rate - Test				Approved:
	Sheet Number:	1	Date:	Jul-25	JS

Infiltration Test (BRE 365)**Trial Pit Details**

Total Pit Depth	0.31	m
Total Pit Length	1.2	m
Total Pit Width	0.3	m

Test Results		
	Time (Mins)	Water Level (From Base)
1	0	0.31
2	2	0.30
3	5	0.28
4	10	0.27
5	15	0.26
6	25	0.24
7	45	0.20
8	75	0.15
9	105	0.11
10	165	0.08
11	210	0.04
12	240	0.03
13	300	0.00
14		
15		
16		
17		
18		
19		
20		



Project:	Twinham, 34 Hurst Road, Lindfield			By:
Calculation:	Soakaway Design			JS
Infiltration Rate - Test 1				Approved:
Sheet Number:	2	Date:	Oct-21	JS

Results

Time to reach 75% depth: 28.8 mins
 Time to reach 25% depth: 160.7 mins

Soil Infiltration Rate: **8.54226E-06** m/s
 0.030752122 m/hr



Service And Maintenance Report

SITE

SITE
Twinham

SERVICE TIME
10:35am on 24/12/2024

OPERATIVE
Engineer 1

General - Pumping Station

✓ Cut grass and overhanging bushes

✓ Clean all kiosks, covers and tank lids

✓ Check primary sludge levels

Visual effluent quality: N/A

Notes:
None

✓ Tidy site removing rubbish

✓ Check safety of system

✓ Ensure manhole covers are secure

Overall system operation: Ok



Moody Sewage Ltd

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Registered in England and Wales no. 06767655

Registered office: 254 Upper Shoreham Road, Shoreham By Sea, BN43 6BF



Pumping Station

- | | |
|---|--|
| ✓ Control floats operation normal | ✓ Pump 1 operation normal |
| ✓ Alarm system OK if applicable | ✓ Check weeds in and around |
| ✓ Pump 2 operation normal (if applies) | ✓ Electrical system clean and safe |
| ✓ Kiosk condition acceptable | ✓ Wet well pipe / guide rails OK |
| ✓ Check control panel - electrics working OK and safe (no sparking, secure) | ✓ Wet well clean and scum removed |
| ✓ Control floats clean and secure (hang right, working) | ✓ Auto controls and electrics acceptable |
| ✓ Non-return valves normal | ✓ Wet well pipe work |
| ✓ Guide rails - not rusted, secure and pumps able to slide up and down | ✓ Chains and pipe work OK |
| ✓ Non return valves - condition / working | ✓ Pump down wet well |
| ✓ Pumps seated correctly | Sludge level: Good |
| Pump 1 megger reading: ok | Pump 1 operation: Good |
| Pump 2 megger reading: n/a | Pump 2 operation: n/a |
| Amp readings pump 1: ok | Amp readings pump 2: n/a |



Moody Sewage Ltd

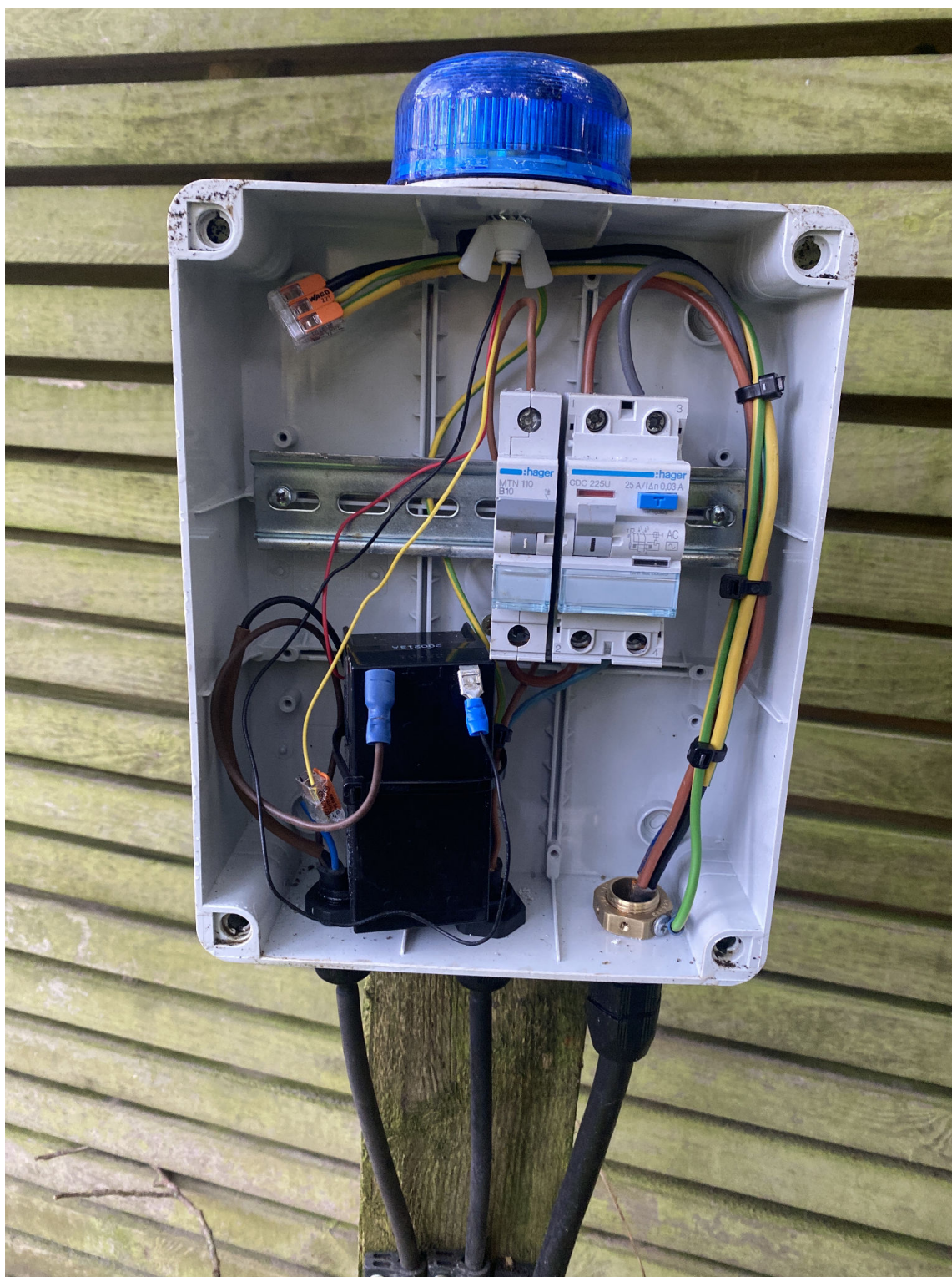
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