7. Appendices

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Appendix 7

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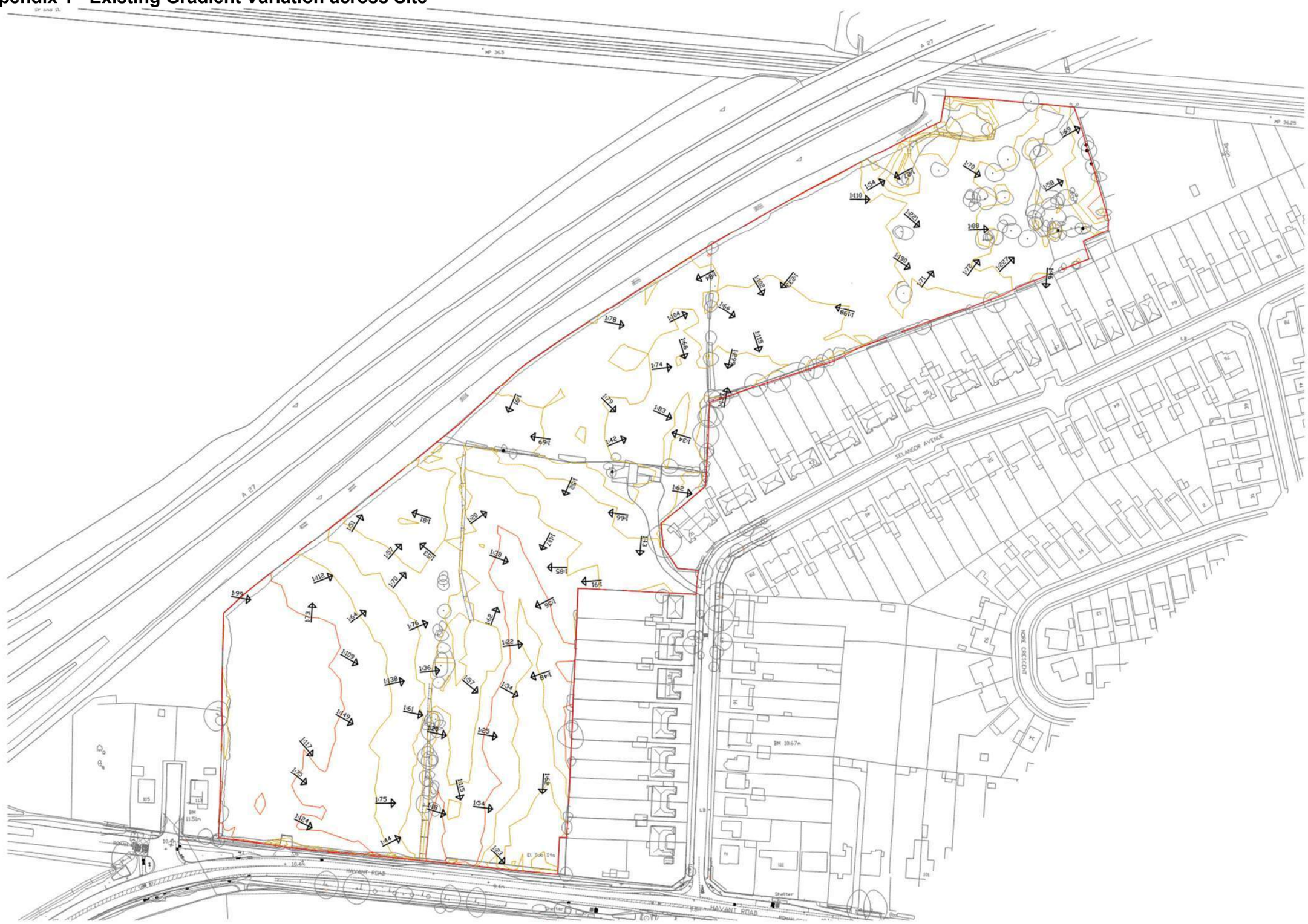
Appendix 8

Drainage Strategy Plans

Appendix 9

Southern Water Correspondence

Appendix 1 - Existing Gradient Variation across Site



Appendix 2 - Current Site Photographs

Current entrance to the site (looking towards Selangor Road):

Full site view looking northwest from current site entrance:

Appendix 3 – Site Investigation Information

- Soakage Test Results Summary
- CLXX(11)8001 Site Investigation Review Sheet 1 of 2
- CLXX(11)8002 Site Investigation Review Sheet 2 of 2

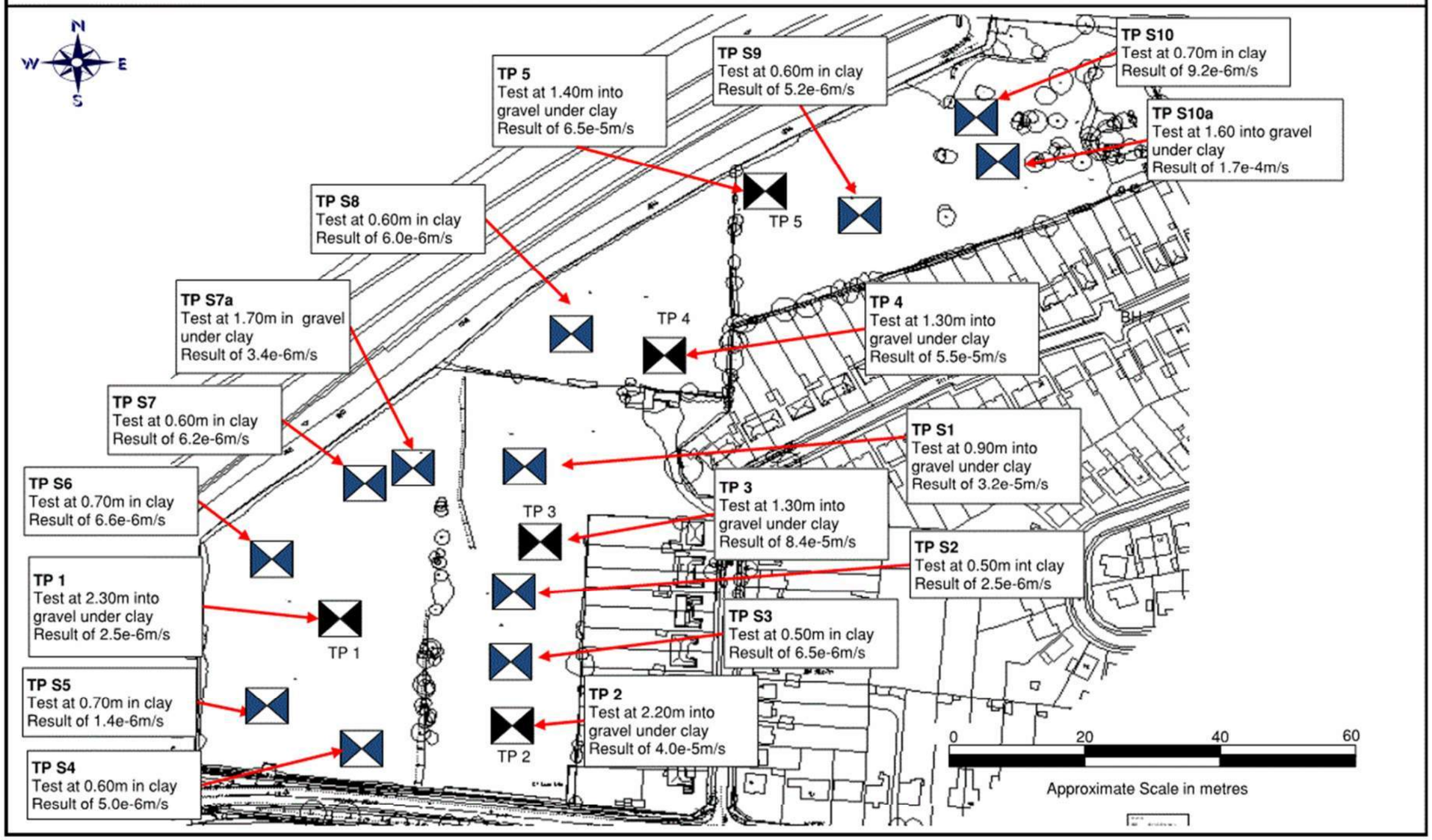
WILSON BAILEY
GEOTECHNICAL & ENVIRONMENTAL

Carters Cottage
Sherrington
Wiltshire
BA12 0SN

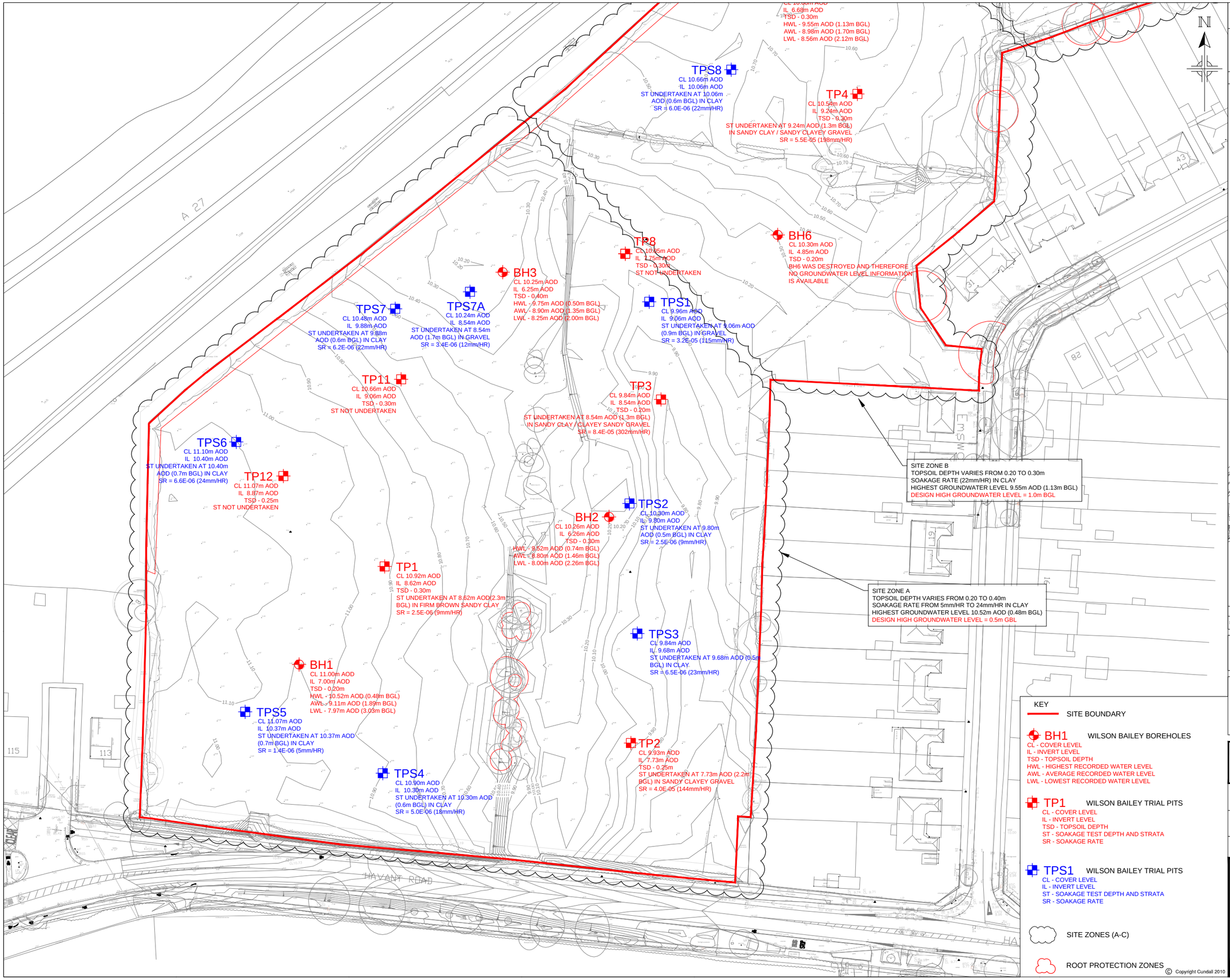
Site Plan Annotated with Soakage Test Results

Site Havant Road Site, Warblington, Emsworth, Hampshire

Client BDW Southampton



J11145 Site Plan (2)



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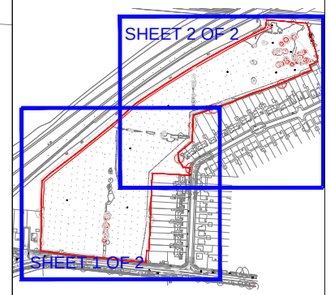
Based on.

Architects Drg No.	Rev
Structural Drg No.	Rev
Survey Drg No.	Rev
Other Drg No.	Rev
Other Drg No.	Rev

DO NOT SCALE FROM THIS DRAWING

Notes

1. LEVEL AND LOCATION OF ALL TRIAL PITS IS INDICATIVE AS THEY WERE NOT SURVEYED



Issue	Date	Description	By	Chkd	Verfd
P1	19/05/2017	PLANNING RESUBMISSION	SJ	AMF	AMF

Project
LAND AT HAVANT ROAD, EMSWORTH

Client
BDW SOUTHAMPTON

Architect
SIMON COOPER ASSOCIATES

Title
SITE INVESTIGATION REVIEW
SHEET 1 OF 2

Drawing No.	Drawing Status
CLXX(11)8001	PLANNING

Job No.	Scale
1012052	1:500 @A1

Originator	Checked	Verified	Issue.
SJ	AMF	AMF	P1

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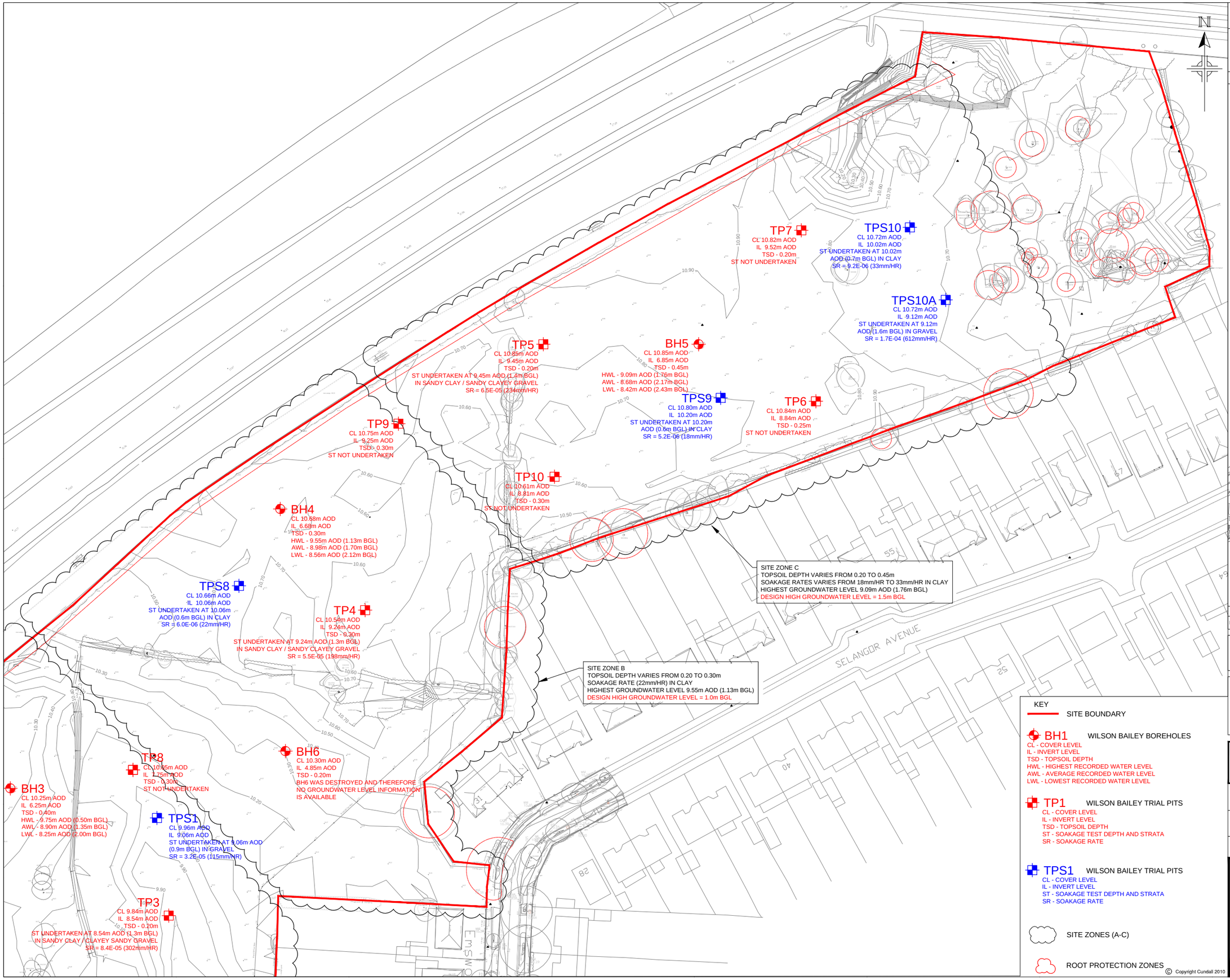

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Based on.

Architects Drg No.	Rev
Structural Drg No.	Rev
Survey Drg No.	Rev
Other Drg No.	Rev
Other Drg No.	Rev

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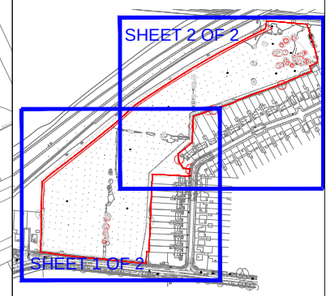
Notes

1. LEVEL AND LOCATION OF ALL TRIAL PITS IS INDICATIVE AS THEY WERE NOT SURVEYED



Issue	Date	Description	By	Chkd	Verfd
P1	19/05/2017	PLANNING RESUBMISSION	SJ	AMF	AMF

Project
LAND AT HAVANT ROAD, EMSWORTH

Client
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Title
SITE INVESTIGATION REVIEW
SHEET 2 OF 2

Drawing No.	Drawing Status
CLXX(11)8002	PLANNING
Job No. 1012052	Scale 1:500 @A1

Originator	Checked	Verified	Issue.
SJ	AMF	AMF	P1

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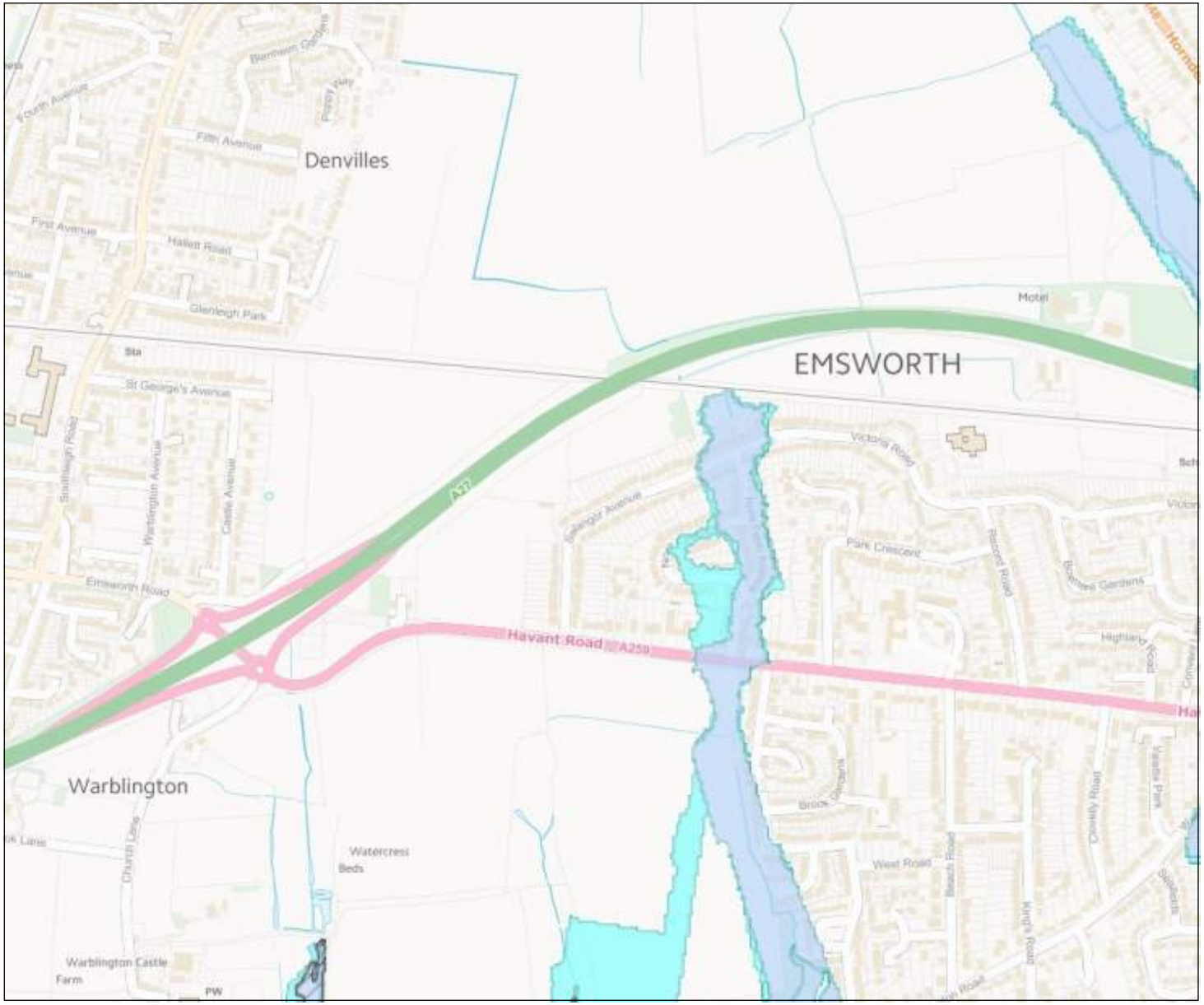
Appendix 4 – Environment Agency Product 4 Flood Risk Information

- Flood Map for Planning (Rivers and Seas)
- Risk of Flooding from Surface Water
- Surface Water Depths - 1 in 30
- Surface Water Depths - 1 in 100
- Surface Water Depths - 1 in 1000

Flood Map for Planning (Rivers and Sea) Centered on Havant Road - Created 03 February 2016



Environment Agency

Scale 1: 10,001

N W E S

Flood Map for Planning (Rivers & Sea)

- Flood Map - Defences
- Area Benefitting from Flood Defences
- Flood Map - Flood Storage Area
- Flood Zone 3
- Flood Zone 2

Flood Map Areas (assuming no defences)

Flood Zone 3 shows the area that could be affected by flooding:

- from the sea with a 1 in 200 or greater chance of happening each year
- or from a river with a 1 in 100 or greater chance of happening each year.

Flood Zone 2 shows the extent of an extreme flood from rivers or the sea with up to a 1 in 1000 chance of occuring each year.

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Contact Us: National Customer Contact Centre, PO Box 544, Rotherham, S60 1BY. Tel: 03708 506 506 (Mon-Fri 8-6). Email: enquiries@environment-agency.gov.uk

Risk of flooding from Surface Water

Environment Agency

Scale 1:10,001

N W E S

Likelihood of flooding from Surface Water

- High (1 in 30yr)
- Medium (1 in 100yr)
- Low (1 in 1000yr)
- Very Low

Likelihood of flooding from Surface Water

High:	Greater than or equal to 1 in 30 (3.3%) chance in any given year
Medium:	Less than 1 in 30 (3.3%) but greater than or equal to 1 in 100 (1%) chance in any given year
Low:	Less than 1 in 100 (1%) but greater than or equal to 1 in 1,000 (0.1%) chance in any given year
Very Low:	Less than 1 in 1,000 (0.1%) chance in any given year

This information is shown on the Risk of Flooding from Surface Water map on our website.

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Surface Water Depths Centered on Havant Road - Created 03 February 2016

Environment Agency

Legend

Flood Depth 1 in 30

- Below 150mm
- 150-300mm
- 300-600mm
- 600-900mm
- 900-1200mm
- Over 1200mm

0 50 100 150

Metres

N W E S

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Surface Water Depths Centered on Havant Road - Created 03 February 2016

Environment Agency

Legend

Flood Depth 1 in 100

- Below 150mm
- 150-300mm
- 300-600mm
- 600-900mm
- 900-1200mm
- Over 1200mm

0 50 100 150

Metres

N W E S

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Surface Water Depths Centered on Havant Road - Created 03 February 2016

Environment Agency

Legend

Flood Depth 1 in 1000

- Below 150mm
- 150-300mm
- 300-600mm
- 600-900mm
- 900-1200mm
- Over 1200mm

0 50 100 150

Metres

N W E S

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Appendix 5 – Flood Risk and Drainage Policy Review

National Planning Policy Framework

The Government's national policy on Development and Flood Risk is covered by the National Planning Policy Framework March 2012 and its associated Technical Guidance. The principal aim of the NPPF for flood risk is:

"Inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risk, but where development is necessary, making it safe without increasing flood risk elsewhere."

The Technical Guidance to the NPPF March 2012 sets out the sequential approach to development and flood risk and the responsibilities of key stakeholders in assessing flood risk. With regard to the sequential approach it states:

"*The overall aim should be to steer new development to Flood Zone 1. Where there are no reasonably available sites in Flood Zone 1, local planning authorities allocating land in local plans or determining planning applications for development at any particular location should take into account the flood risk vulnerability of land uses (see table 2) and consider reasonably available sites in Flood Zone 2, applying the Exception Test if required (see table 3). Only where there are no reasonably available sites in Flood Zones 1 or 2 should the suitability of sites in Flood Zone 3 be considered, taking into account the flood risk vulnerability of land uses and applying the Exception Test if required*."

The tables relating to flood risk vulnerability classification and flood zone compatibility are included in Appendix 6 below.

Central Government Written Statement to Parliament on Sustainable Drainage Systems, 18 December 2014

In absence of implementation of Section 3 of the Flood and Water Management Act 2010 relating to National Standards, Approving Bodies and Mandatory Adoption for sustainable drainage the Secretary of State for Communities and Local Government has instructed Local Planning Authorities to ensure that sustainable drainage systems for the management of run-off are put in place, unless demonstrated to be inappropriate and that there are clear arrangements in place for ongoing maintenance over the lifetime of the development.

The new guidance took effect on 6 April 2015 and include all major development as defined by Article 2(1) of the Town and Country Planning (Development Management Procedure) (England) Order 2010).

Update from Environment Agency on Flood Risk Assessments: Climate Change Allowances, 19 February 2016

The Environment Agency issued an update on previous climate change allowances to support the National Planning Policy Framework, effective from 19th February 2016. The updated guidance includes an increase in peak rainfall intensity allowance to 40% to account for climate change for small and urban catchments.

Havant Borough Core Strategy, March 2011

The Havant Borough Core Strategy is part of the borough's Local Development Framework [HBLDF] and sets an overall policy framework for all other local development documents. The Core Strategy was adopted on 1st March 2011 and as part of the HBLDF will guide the development of the borough until 2026.

Section 1.06 states: *"[The Core Strategy] contains strategic policies and some detailed development management policies against which individual planning applications will be assessed. When considering planning applications the council will consider all the policies contained in the Core Strategy that are relevant to the proposal."*

Policy CS15 Flood and Coastal Erosion Risk states:

"Development in areas at risk of flooding now and in the future as identified on the latest Environment Agency flood risk maps and Strategic Flood Risk Assessment climate change maps will only be permitted where:

1. It meets the sequential and exception test (where required) in relation to PPS25.

2. The site is located in a low hazard area as defined in the Strategic Flood Risk Assessment.

3. A site-specific flood risk assessment demonstrates that the development will be safe, including the access, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall.

4. The scheme incorporates flood protection, flood resilience and resistance measures appropriate to the character and biodiversity of the area and the specific requirements of the site.

5. Appropriate flood warning and evacuation plans are in place.

6. New site drainage systems are designed taking account of events which exceed the normal design standard.

All development will be required to ensure that there is no net increase in surface water run off. Priority should be given to incorporating Sustainable Drainage Systems (SuDS) to manage surface water drainage, unless it is proven that SuDS are not appropriate. Where SuDs are provided arrangements must be put in place for their whole life management and maintenance.

The council will work with partners to implement the Coastal Policy Zones in the North Solent Shoreline Management Plan to ensure that development avoids areas at risk from coastal erosion and coastal flooding and that areas required to offset coastal squeeze and prevent habitat fragmentation, to allow species to adapt to climate change, are identified and protected from development."

Havant Borough Local Plan (Allocations), July 2014

The Allocations Plan was adopted on 23rd July 2014 and as part of the HBLDF will guide the development of the borough until 2026.

Policy DM25 states: "*Planning permission will be granted for developments within the Emsworth urban area boundary that can demonstrate how post development runoff has been reduced by the greatest percentage rates and volumes that are possible in the context of cost, technical feasibility and viability*."

Havant Borough Local Plan Housing Statement, December 2016

Yet to be adopted, the Housing Statement identifies the requirement for new housing within Havant Borough. The proposed site is listed (reference 'UW02b'), and as such is subject to the remainder of the policies listed in the Adopted Local Plan and Guiding Principles listed within the Housing Statement.

PUSH Strategic Flood Risk Assessment, December 2007

The Strategic Flood Risk Assessment was produced for the Partnership for Urban South Hampshire.

Section 4.2.1 states: *"Output Package 1* [of the SFRA] *is intended to assist in the application of the Sequential test, by providing information to guide decisions on location of future development in relation to areas of flood risk and, more specifically, the Flood Zones."*

The above package has been consulted in this Flood Risk Assessment.

Hampshire Local Flood Risk Management Strategy, July 2013

The Local Flood Risk Management Strategy (LFRMS) was produced to aid in the understanding and management of flood risk across the county.

The LFRMS identifies Emsworth and Selangor Avenue as subjects of previous instances of flooding.

Hampshire Groundwater Management Plan, October 2013

The Groundwater Management Plan establishes the risk of groundwater flooding throughout Hampshire.

Havant has previously been identified (in the LFRMS) as being at risk of groundwater flooding, however previous causes of flooding in the borough have not been attributable to groundwater therefore it is not addressed within this Plan.

Emsworth Flood Risk Strategy Review, October 2015

The area surrounding the site is identified as being affected by flooding.

Section 1.2 states: *"Emsworth is one of the Borough's few urban areas to suffer from flooding. The settlement is located on the coast and includes the Nore Farm Stream, the West Brook and the River Ems. Over recent years, extreme weather and high tides have resulted in a high frequency of flood events, which have affected local residents and businesses and caused considerable damage to properties. These flood events were caused by a combination of fluvial and tidal influences and principally affected Selangor Avenue, Victoria Road, North Street and Bridge Road in Emsworth."*

Policy DM25 from the Local Plan (allocations) is applicable to all new developments within Emsworth.

The proposed alleviation schemes for Emsworth are mentioned and the Nore Farm Stream Flood Alleviation Scheme is highlighted – this has been taken into account in this Flood Risk Assessment.

North Solent Coastline Management Plan, December 2010

The North Solent Coastline Management Plan was completed on 16th December 2010 and assesses risks associated with coastal flooding and shoreline evolution at a large scale.

The site has no specific mention in the policy statement maps.

Appendix 6 – NPPF Technical Guidance Tables 2 & 3

Table 2: Flood Risk Vulnerability Classification

Essential Infrastructure • Essential transport infrastructure (including mass evacuation routes) which has to cross the area at risk. • Essential utility infrastructure which has to be located in a flood risk area for operational reasons, including electricity generating power stations and grid and primary substations; and water treatment works that need to remain operational in times of flood. • Wind turbines.
Highly Vulnerable • Police and ambulance stations; fire stations and command centres; telecommunications installations required to be operational during flooding. • Emergency dispersal points. • Basement dwellings. • Caravans, mobile homes and park homes intended for permanent residential use. • Installations requiring hazardous substances consent. (Where there is a demonstrable need to locate such installations for bulk storage of materials with port or other similar facilities, or such installations with energy infrastructure or carbon capture and storage installations, that require coastal or water-side locations, or need to be located in other high flood risk areas, in these instances the facilities should be classified as 'Essential Infrastructure').
More Vulnerable • Hospitals • Residential institutions such as residential care homes, children's homes, social services homes, prisons and hostels. • Buildings used for dwelling houses, student halls of residence, drinking establishments, nightclubs and hotels. • Non–residential uses for health services, nurseries and educational establishments. • Landfill* and sites used for waste management facilities for hazardous waste. • Sites used for holiday or short-let caravans and camping, subject to a specific warning and evacuation plan.

Less Vulnerable • Police, ambulance and fire stations which are not required to be operational during flooding. • Buildings used for shops; financial, professional and other services; restaurants, cafes and hot food takeaways; offices; general industry, storage and distribution; non-residential institutions not included in the 'More Vulnerable' class; and assembly and leisure. • Land and buildings used for agriculture and forestry. • Waste treatment (except landfill* and hazardous waste facilities). • Minerals working and processing (except for sand and gravel working). • Water treatment works which do not need to remain operational during times of flood. • Sewage treatment works, if adequate measures to control pollution and manage sewage during flooding events are in place.
Water-Compatible Development • Flood control infrastructure. • Water transmission infrastructure and pumping stations. • Sewage transmission infrastructure and pumping stations. • Sand and gravel working. • Docks, marinas and wharves. • Navigation facilities. • Ministry of Defence defence installations. • Ship building, repairing and dismantling, dockside fish processing and refrigeration and compatible activities requiring a waterside location. • Water-based recreation (excluding sleeping accommodation). • Lifeguard and coastguard stations. • Amenity open space, nature conservation and biodiversity, outdoor sports and recreation and essential facilities such as changing rooms. • Essential ancillary sleeping or residential accommodation for staff required by uses in this category, subject to a specific warning and evacuation plan.

Table 3: Flood Risk Vulnerability and Flood Risk Zone 'Compatibility'

Flood Zones	Flood Risk Vulnerability Classification				
	Essential infrastructure	Highly vulnerable	More vulnerable	Less vulnerable	Water compatible
Zone 1	✓	✓	✓	✓	✓
Zone 2	✓	Exception Test required	✓	✓	✓
Zone 3a †	Exception Test required †	✗	Exception Test required	✓	✓
Zone 3b *	Exception Test required *	✗	✗	✗	✓*

Key:

✓ Development is appropriate

✗ Development should not be permitted.

Notes to table 3:

- This table does not show the application of the Sequential Test which should be applied first to guide development to Flood Zone 1, then Zone 2, and then Zone 3; nor does it reflect the need to avoid flood risk from sources other than rivers and the sea;
- The Sequential and Exception Tests do not need to be applied to minor developments and changes of use, except for a change of use to a caravan, camping or chalet site, or to a mobile home or park home site;
- Some developments may contain different elements of vulnerability and the highest vulnerability category should be used, unless the development is considered in its component parts.

† In Flood Zone 3a essential infrastructure should be designed and constructed to remain operational and safe in times of flood.

* In Flood Zone 3b (functional floodplain) essential infrastructure that has to be there and has passed the Exception Test, and water-compatible uses, should be designed and constructed to:

- remain operational and safe for users in times of flood;
- result in no net loss of floodplain storage;
- not impede water flows and not increase flood risk elsewhere.

Appendix 7 – Greenfield Runoff and SuDS Storage Calculations

- Greenfield Runoff to IH 124
- SUDS Component Sizing Summary and Micro Drainage Reports
    - Car Park Permeable Paving Areas
    - Road Permeable Paving
    - Road Soakaways
- Conveyance Drainage Network Model

CUNDALL	JOB NUMBER / FILE:	CALCULATION NUMBER:	DRAWING REFERENCE:
	1012052	CAL-CL001	

JOB TITLE:	REV	CALCULATION BY:	DATE	CHECKED BY	VERIFIED BY:
Land at Havant Road, Emsworth	0	LK	05/05/16	AMF	AMF
CALCULATION: Greenfield Runoff	1	LK	21/04/17	AMF	AMF
	2				

CALCULATIONS:

REF | OUTPUT

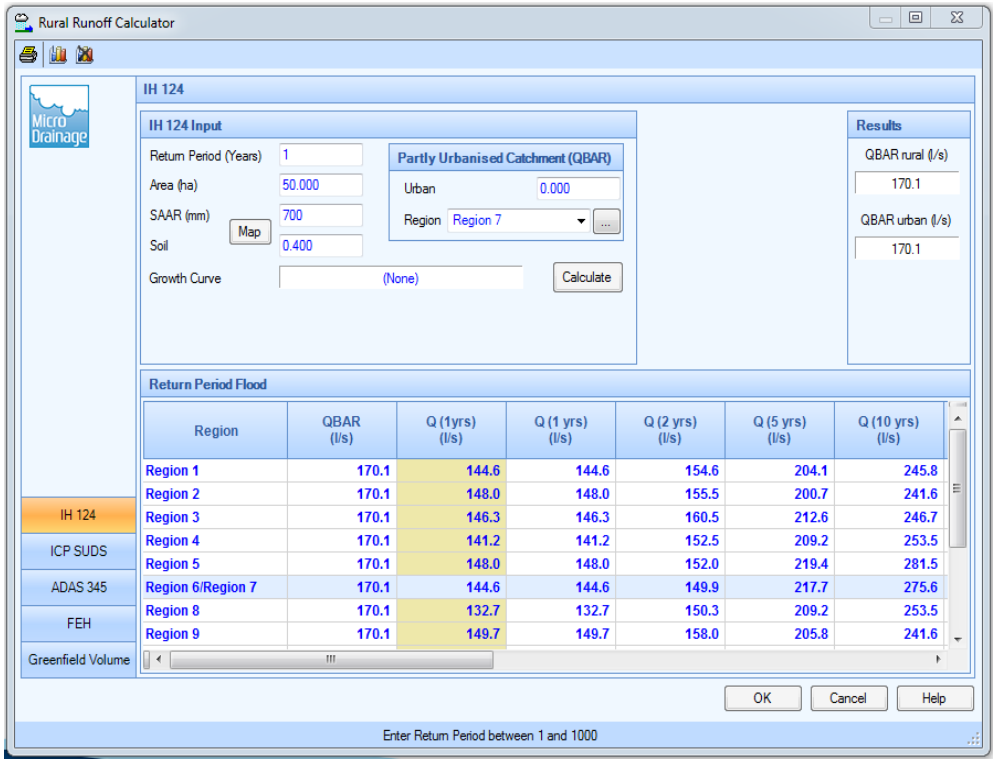
Surface water storage requirement

Existing site Total site area (m^2) ***63000***

Hard standing	Area (m^2)	Soft standing	Area (m^2)
No hard standing on existing site		Greenfield land	63000
			63000

Existing Greenfield Run-off

Based on site size of 63000m², IH124 Method selected.

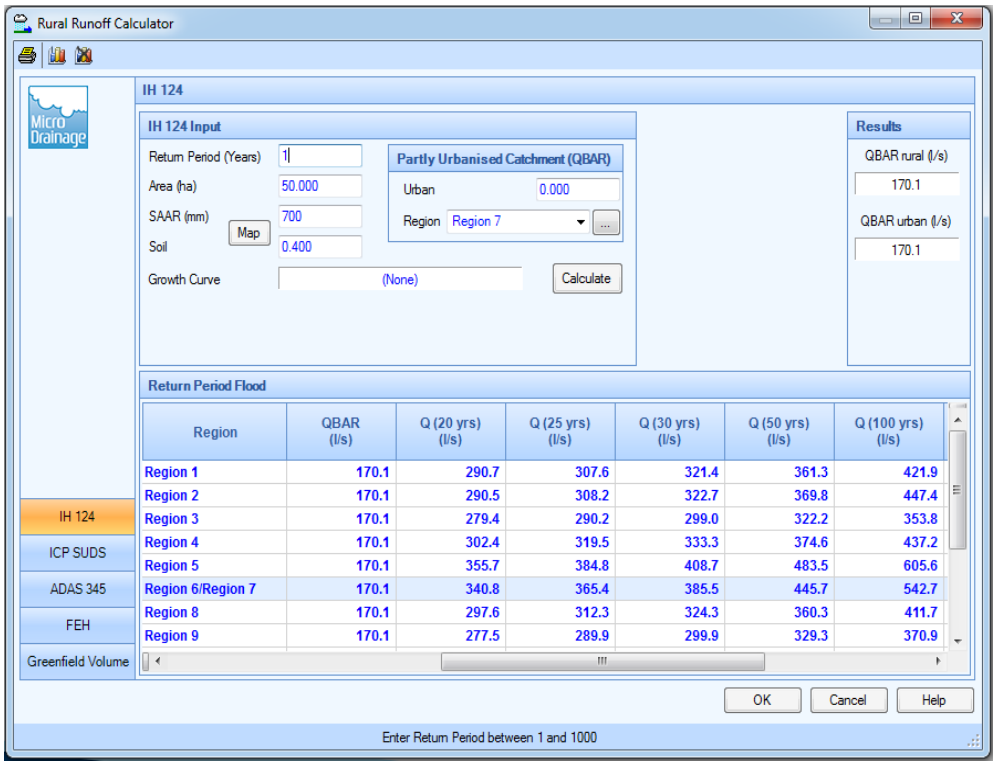


Region	QBAR (l/s)	Q (1yrs) (l/s)	Q (1 yrs) (l/s)	Q (2 yrs) (l/s)	Q (5 yrs) (l/s)	Q (10 yrs) (l/s)
Region 1	170.1	144.6	144.6	154.6	204.1	245.8
Region 2	170.1	148.0	148.0	155.5	200.7	241.6
Region 3	170.1	146.3	146.3	160.5	212.6	246.7
Region 4	170.1	141.2	141.2	152.5	209.2	253.5
Region 5	170.1	148.0	148.0	152.0	219.4	281.5
Region 6/Region 7	170.1	144.6	144.6	149.9	217.7	275.6
Region 8	170.1	132.7	132.7	150.3	209.2	253.5
Region 9	170.1	149.7	149.7	158.0	205.8	241.6

CUNDALL	JOB NUMBER / FILE:	CALCULATION NUMBER:	DRAWING REFERENCE:		
	1012052	CAL-CL001			
JOB TITLE: Land at Havant Road, Emsworth	REV	CALCULATION BY:	DATE	CHECKED BY	VERIFIED BY:
	0	LK	05/05/16	AMF	AMF
CALCULATION: Greenfield Runoff	1	LK	21/04/17	AMF	AMF
	2				

CALCULATIONS:

REF | OUTPUT



Region	QBAR (l/s)	Q (20 yrs) (l/s)	Q (25 yrs) (l/s)	Q (30 yrs) (l/s)	Q (50 yrs) (l/s)	Q (100 yrs) (l/s)
Region 1	170.1	290.7	307.6	321.4	361.3	421.9
Region 2	170.1	290.5	308.2	322.7	369.8	447.4
Region 3	170.1	279.4	290.2	299.0	322.2	353.8
Region 4	170.1	302.4	319.5	333.3	374.6	437.2
Region 5	170.1	355.7	384.8	408.7	483.5	605.6
Region 6/Region 7	170.1	340.8	365.4	385.5	445.7	542.7
Region 8	170.1	297.6	312.3	324.3	360.3	411.7
Region 9	170.1	277.5	289.9	299.9	329.3	370.9

IH124 Method is used for areas of 50ha, therefore values factored down for site area:

Storm Return Period	(l/s)
QBAR	21.4
1 Year	18.2
2 Years	18.9
5 Years	27.4
10 Years	34.7
20 Years	42.9
50 Years	56.2
100 Years	68.4

For all soft-standing area for a 1 in 1 year event, Q1 = 18.2 l/s, Qbar = 21.4 l/s

Greenfield runoff rate = 18.2 l/s (1 in 1 year event)

Greenfield runoff for drainage areas A & B only (C to infiltrate to ground)

Approx. area of site within drainage areas A & B: 36033 m^2 = 3.6 ha

Approx. area of site kept as free-draining soft landscaping: 14389 m^2 = 1.44 ha

CUNDALL	JOB NUMBER / FILE:	CALCULATION NUMBER:	DRAWING REFERENCE:
	1012052	CAL-CL001	

JOB TITLE:	REV	CALCULATION BY:	DATE	CHECKED BY	VERIFIED BY:
Land at Havant Road, Emsworth	0	LK	05/05/16	AMF	AMF
CALCULATION: Greenfield Runoff	1	LK	21/04/17	AMF	AMF
	2				

CALCULATIONS:

REF

OUTPUT

Storm Return Period	Flow Rate for Areas A & B (l/s)	Flow Rate for soft landscaping (l/s)
QBAR	12.3	4.9
1 Year	10.4	4.2
2 Years	10.8	4.3
5 Years	15.7	6.3
10 Years	19.9	7.9
20 Years	24.6	9.8
50 Years	32.1	12.8
100 Years	39.1	15.6

Greenfield runoff rate for areas A&B only = 12.3 l/s (QBAR)

CUNDALL	JOB NUMBER / FILE:	CALCULATION NUMBER:	DRAWING REFERENCE:
	1012052	-	CLXX(52)2001 & 2002

JOB TITLE:	REV	CALCULATION BY:	DATE	CHECKED BY	VERIFIED BY:
Land at Havant Road, Emsworth	0	AC	01/03/17	AMF	AMF
CALCULATION: Soakaway Design Summary	1	LK	16/05/17	AMF	AMF
	2	LK	04/12/17	SP	SP

CALCULATIONS:

SOAKAWAY REFERENCE	TYPE	TRIAL PIT REF	INFILTRATION RATE (m/s)	DRAINED AREA (m^2) + 10% URBAN CREEP	SIZE - PLAN AREA (m^2)	STORAGE DEPTH (mm)	TOTAL DEPTH (mm)
Car Park A	Permeable Paving	TP S9	5.20E-06	198	100	370	500
Car Park B	Permeable Paving	TP S9	5.20E-06	347	170	370	500
Car Park C	Permeable Paving	TP S9	5.20E-06	453	211	370	500
Car Park D	Permeable Paving	TP S10	9.20E-06	664	225	370	500
Car Park E	Permeable Paving	TP S10	9.20E-06	407	176	370	500
Permeable Road 1	Permeable Paving & Permavoid	TP S9	5.20E-06	858	358	370	500
Permeable Road 2	Permeable Paving & Permavoid	TP S9	5.20E-06	1885	797	370	500
Road Soakaway 1	Permavoid	TP S9	5.20E-06	869	190	350	500
Road Soakaway 2	Permavoid	TP S9	5.20E-06	597	118	350	500
Road Soakaway 3	Permavoid	TP S10	9.20E-06	350	64	350	500

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Proposed Surface Water Drainage.SWS

Pipe Sizes STANDARD Manhole Sizes STANDARD

FEH Rainfall Model

Return Period (years)	2
FEH Rainfall Version	2013
Site Location	GB 473800 105650 SU 73800 05650
Data Type	Catchment
Maximum Rainfall (mm/hr)	0
Maximum Time of Concentration (mins)	30
Foul Sewage (l/s/ha)	0.000
Volumetric Runoff Coeff.	0.750
PIMP (%)	100
Add Flow / Climate Change (%)	0
Minimum Backdrop Height (m)	0.000
Maximum Backdrop Height (m)	0.000
Min Design Depth for Optimisation (m)	1.000
Min Vel for Auto Design only (m/s)	0.75
Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Network Design Table for Proposed Surface Water Drainage.SWS

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	6.605	0.134	49.3	0.026	5.00	0.0	0.600	o	150	Pipe/Conduit	
S1.001	8.175	0.036	227.1	0.028	0.00	0.0	0.600	o	225	Pipe/Conduit	
S2.000	6.614	0.174	38.0	0.018	5.00	0.0	0.600	o	150	Pipe/Conduit	
S1.002	27.402	0.091	301.1	0.025	0.00	0.0	0.600	o	300	Pipe/Conduit	
S1.003	8.451	0.026	325.0	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
S1.004	20.208	0.051	396.2	0.032	0.00	0.0	0.600	o	450	Pipe/Conduit	
S3.000	15.589	0.104	150.0	0.050	5.00	0.0	0.600	o	150	Pipe/Conduit	
S3.001	7.243	0.048	150.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S1.005	11.703	0.029	403.6	0.000	0.00	0.0	0.600	o	450	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	0.00	5.08	9.665	0.026	0.0	0.0	0.0	1.44	25.4	0.0
S1.001	0.00	5.23	9.256	0.054	0.0	0.0	0.0	0.86	34.3	0.0
S2.000	0.00	5.07	9.500	0.018	0.0	0.0	0.0	1.64	28.9	0.0
S1.002	0.00	5.74	9.145	0.097	0.0	0.0	0.0	0.90	63.7	0.0
S1.003	0.00	5.88	8.979	0.097	0.0	0.0	0.0	1.00	110.4	0.0
S1.004	0.00	6.21	8.878	0.129	0.0	0.0	0.0	1.02	161.5	0.0
S3.000	0.00	5.32	9.450	0.050	0.0	0.0	0.0	0.82	14.5	0.0
S3.001	0.00	5.47	9.346	0.050	0.0	0.0	0.0	0.82	14.5	0.0
S1.005	0.00	6.41	8.827	0.179	0.0	0.0	0.0	1.01	160.0	0.0

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Network Design Table for Proposed Surface Water Drainage.SWS

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
S4.000	5.907	0.159	37.2	0.025	5.00	0.0	0.600	o	150	Pipe/Conduit	
S1.006	22.310	0.056	398.4	0.025	0.00	0.0	0.600	o	450	Pipe/Conduit	
S5.000	52.228	0.174	300.0	0.082	5.00	0.0	0.600	o	300	Pipe/Conduit	
S6.000	30.872	0.103	299.7	0.047	5.00	0.0	0.600	o	300	Pipe/Conduit	
S5.001	64.862	0.216	300.3	0.102	0.00	0.0	0.600	o	300	Pipe/Conduit	
S5.002	8.229	0.027	304.8	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
S1.007	35.551	0.089	399.4	0.028	0.00	0.0	0.600	o	450	Pipe/Conduit	
S7.000	25.648	0.171	150.0	0.030	5.00	0.0	0.600	o	150	Pipe/Conduit	
S8.000	14.938	0.100	150.0	0.014	5.00	0.0	0.600	o	150	Pipe/Conduit	
S7.001	7.745	0.052	150.0	0.050	0.00	0.0	0.600	o	150	Pipe/Conduit	
S1.008	16.572	0.041	404.2	0.028	0.00	0.0	0.600	o	450	Pipe/Conduit	
S1.009	12.879	0.032	400.0	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
S9.000	11.921	0.040	300.0	0.093	5.00	0.0	0.600	o	300	Pipe/Conduit	
S9.001	5.175	0.023	225.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
S1.010	29.276	0.073	401.0	0.030	0.00	0.0	0.600	o	450	Pipe/Conduit	
S10.000	7.166	0.118	60.7	0.090	5.00	0.0	0.600	o	150	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)
S4.000	0.00	5.06	9.488	0.025	0.0	0.0	0.0	1.66	29.3	0.0
S1.006	0.00	6.78	8.798	0.229	0.0	0.0	0.0	1.01	161.0	0.0
S5.000	0.00	5.96	9.200	0.082	0.0	0.0	0.0	0.90	63.8	0.0
S6.000	0.00	5.57	9.200	0.047	0.0	0.0	0.0	0.90	63.8	0.0
S5.001	0.00	7.16	9.026	0.231	0.0	0.0	0.0	0.90	63.8	0.0
S5.002	0.00	7.32	8.810	0.231	0.0	0.0	0.0	0.90	63.3	0.0
S1.007	0.00	7.90	8.633	0.488	0.0	0.0	0.0	1.01	160.8	0.0
S7.000	0.00	5.52	9.459	0.030	0.0	0.0	0.0	0.82	14.5	0.0
S8.000	0.00	5.30	9.284	0.014	0.0	0.0	0.0	0.82	14.5	0.0
S7.001	0.00	5.68	9.184	0.094	0.0	0.0	0.0	0.82	14.5	0.0
S1.008	0.00	8.18	8.544	0.610	0.0	0.0	0.0	1.01	159.8	0.0
S1.009	0.00	8.39	8.503	0.610	0.0	0.0	0.0	1.01	160.7	0.0
S9.000	0.00	5.22	9.250	0.093	0.0	0.0	0.0	0.90	63.8	0.0
S9.001	0.00	5.30	9.210	0.093	0.0	0.0	0.0	1.04	73.8	0.0
S1.010	0.00	8.87	8.471	0.733	0.0	0.0	0.0	1.01	160.5	0.0
S10.000	0.00	5.09	9.440	0.090	0.0	0.0	0.0	1.29	22.8	0.0

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Network Design Table for Proposed Surface Water Drainage.SWS

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
S1.011	8.575	0.021	400.0	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
S11.000	8.174	0.125	65.4	0.008	5.00	0.0	0.600	o	150	Pipe/Conduit	
S1.012	17.101	0.043	400.0	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
S12.000	4.466	0.015	297.7	0.050	5.00	0.0	0.600	o	300	Pipe/Conduit	
S12.001	6.770	0.023	300.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
S1.013	15.872	0.040	396.8	0.034	0.00	0.0	0.600	o	450	Pipe/Conduit	
S13.000	18.120	0.060	300.0	0.055	5.00	0.0	0.600	o	300	Pipe/Conduit	
S13.001	7.364	0.130	56.6	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
S1.014	7.697	0.019	400.0	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
S1.015	13.038	0.033	400.0	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
S14.000	7.351	0.165	44.6	0.009	5.00	0.0	0.600	o	150	Pipe/Conduit	
S14.001	4.809	0.047	103.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S1.016	17.713	0.044	402.6	0.067	0.00	0.0	0.600	o	600	Pipe/Conduit	
S1.017	8.189	0.020	400.0	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
S15.000	7.072	0.205	34.5	0.010	5.00	0.0	0.600	o	150	Pipe/Conduit	
S1.018	11.111	0.028	400.0	0.000	0.00	0.0	0.600	o	600	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)
S1.011	0.00	9.01	8.398	0.823	0.0	0.0	0.0	1.01	160.7	0.0
S11.000	0.00	5.11	9.451	0.008	0.0	0.0	0.0	1.25	22.0	0.0
S1.012	0.00	9.30	8.376	0.831	0.0	0.0	0.0	1.01	160.7	0.0
S12.000	0.00	5.08	9.350	0.050	0.0	0.0	0.0	0.91	64.0	0.0
S12.001	0.00	5.21	9.335	0.050	0.0	0.0	0.0	0.90	63.8	0.0
S1.013	0.00	9.56	8.334	0.915	0.0	0.0	0.0	1.01	161.3	0.0
S13.000	0.00	5.33	9.300	0.055	0.0	0.0	0.0	0.90	63.8	0.0
S13.001	0.00	5.39	9.240	0.055	0.0	0.0	0.0	2.09	148.0	0.0
S1.014	0.00	9.68	8.294	0.970	0.0	0.0	0.0	1.01	160.7	0.0
S1.015	0.00	9.90	8.274	0.970	0.0	0.0	0.0	1.01	160.7	0.0
S14.000	0.00	5.08	9.366	0.009	0.0	0.0	0.0	1.51	26.7	0.0
S14.001	0.00	5.16	9.201	0.009	0.0	0.0	0.0	0.99	17.5	0.0
S1.016	0.00	10.14	8.092	1.046	0.0	0.0	0.0	1.21	341.4	0.0
S1.017	0.00	10.26	8.048	1.046	0.0	0.0	0.0	1.21	342.5	0.0
S15.000	0.00	5.07	9.350	0.010	0.0	0.0	0.0	1.72	30.4	0.0
S1.018	0.00	10.41	8.027	1.056	0.0	0.0	0.0	1.21	342.5	0.0

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Network Design Table for Proposed Surface Water Drainage.SWS

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
S16.000	7.039	0.166	42.4	0.000	5.00	0.0	0.600	o	150	Pipe/Conduit	
S1.019	15.581	0.039	399.5	0.030	0.00	0.0	0.600	o	600	Pipe/Conduit	
S17.000	27.345	0.091	300.0	0.040	5.00	0.0	0.600	o	300	Pipe/Conduit	
S18.000	6.880	0.067	102.7	0.037	5.00	0.0	0.600	o	150	Pipe/Conduit	
S17.001	14.574	0.049	300.0	0.012	0.00	0.0	0.600	o	300	Pipe/Conduit	
S19.000	6.921	0.067	103.3	0.036	5.00	0.0	0.600	o	150	Pipe/Conduit	
S17.002	23.173	0.077	300.0	0.033	0.00	0.0	0.600	o	300	Pipe/Conduit	
S17.003	13.192	0.044	299.8	0.010	0.00	0.0	0.600	o	300	Pipe/Conduit	
S20.000	31.338	0.104	300.0	0.050	5.00	0.0	0.600	o	300	Pipe/Conduit	
S20.001	14.157	0.047	300.0	0.014	0.00	0.0	0.600	o	300	Pipe/Conduit	
S17.004	34.178	0.114	299.8	0.038	0.00	0.0	0.600	o	300	Pipe/Conduit	
S17.005	45.542	0.152	299.6	0.098	0.00	0.0	0.600	o	300	Pipe/Conduit	
S17.006	8.691	0.029	300.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
S1.020	15.710	0.039	400.0	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
S21.000	43.926	0.146	300.9	0.079	5.00	0.0	0.600	o	300	Pipe/Conduit	
S22.000	23.581	0.079	298.5	0.043	5.00	0.0	0.600	o	300	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)
S16.000	0.00	5.08	9.500	0.000	0.0	0.0	0.0	1.55	27.4	0.0
S1.019	0.00	10.62	7.999	1.086	0.0	0.0	0.0	1.21	342.7	0.0
S17.000	0.00	5.50	9.370	0.040	0.0	0.0	0.0	0.90	63.8	0.0
S18.000	0.00	5.12	9.600	0.037	0.0	0.0	0.0	0.99	17.5	0.0
S17.001	0.00	5.77	9.279	0.089	0.0	0.0	0.0	0.90	63.8	0.0
S19.000	0.00	5.12	9.666	0.036	0.0	0.0	0.0	0.99	17.5	0.0
S17.002	0.00	6.20	9.230	0.158	0.0	0.0	0.0	0.90	63.8	0.0
S17.003	0.00	6.45	9.153	0.168	0.0	0.0	0.0	0.90	63.8	0.0
S20.000	0.00	5.58	10.000	0.050	0.0	0.0	0.0	0.90	63.8	0.0
S20.001	0.00	5.84	9.896	0.064	0.0	0.0	0.0	0.90	63.8	0.0
S17.004	0.00	7.08	9.109	0.270	0.0	0.0	0.0	0.90	63.8	0.0
S17.005	0.00	7.92	8.995	0.368	0.0	0.0	0.0	0.90	63.8	0.0
S17.006	0.00	8.08	8.843	0.368	0.0	0.0	0.0	0.90	63.8	0.0
S1.020	0.00	10.84	7.960	1.454	0.0	0.0	0.0	1.21	342.5	0.0
S21.000	0.00	5.81	9.090	0.079	0.0	0.0	0.0	0.90	63.7	0.0
S22.000	0.00	5.43	9.090	0.043	0.0	0.0	0.0	0.90	64.0	0.0

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Network Design Table for Proposed Surface Water Drainage.SWS

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
S21.001	48.975	0.163	300.5	0.066	0.00	0.0	0.600	o	300	Pipe/Conduit	
S23.000	5.807	0.039	150.0	0.048	5.00	0.0	0.600	o	150	Pipe/Conduit	
S21.002	16.134	0.157	102.8	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
S24.000	7.676	0.183	41.9	0.170	5.00	0.0	0.600	o	300	Pipe/Conduit	
S1.021	9.115	0.023	400.0	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
S25.000	6.727	0.182	37.0	0.010	5.00	0.0	0.600	o	150	Pipe/Conduit	
S1.022	26.459	0.066	400.0	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
S1.023	20.279	0.051	397.6	0.028	0.00	0.0	0.600	o	600	Pipe/Conduit	
S26.000	8.141	0.020	407.1	0.043	5.00	0.0	0.600	o	600	Pipe/Conduit	
S26.001	14.640	0.037	400.0	0.150	0.00	0.0	0.600	o	600	Pipe/Conduit	
S26.002	15.784	0.039	400.0	0.029	0.00	0.0	0.600	o	600	Pipe/Conduit	
S26.003	9.953	0.025	400.0	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
S1.024	15.384	0.038	404.8	0.057	0.00	0.0	0.600	o	600	Pipe/Conduit	
S1.025	6.646	0.017	400.0	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
S27.000	28.933	0.096	301.4	0.059	5.00	0.0	0.600	o	300	Pipe/Conduit	
S27.001	9.035	0.030	301.2	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
S28.000	14.229	0.108	131.8	0.160	5.00	0.0	0.600	o	300	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)
S21.001	0.00	6.72	8.944	0.188	0.0	0.0	0.0	0.90	63.7	0.0
S23.000	0.00	5.12	9.285	0.048	0.0	0.0	0.0	0.82	14.5	0.0
S21.002	0.00	6.89	8.781	0.236	0.0	0.0	0.0	1.55	109.6	0.0
S24.000	0.00	5.05	9.476	0.170	0.0	0.0	0.0	2.43	172.1	0.0
S1.021	0.00	10.97	7.921	1.860	0.0	0.0	0.0	1.21	342.5	0.0
S25.000	0.00	5.07	9.591	0.010	0.0	0.0	0.0	1.66	29.3	0.0
S1.022	0.00	11.33	7.898	1.870	0.0	0.0	0.0	1.21	342.5	0.0
S1.023	0.00	11.61	7.832	1.898	0.0	0.0	0.0	1.22	343.5	0.0
S26.000	0.00	5.11	8.596	0.043	0.0	0.0	0.0	1.20	339.5	0.0
S26.001	0.00	5.31	8.576	0.193	0.0	0.0	0.0	1.21	342.5	0.0
S26.002	0.00	5.53	8.539	0.222	0.0	0.0	0.0	1.21	342.5	0.0
S26.003	0.00	5.67	8.500	0.222	0.0	0.0	0.0	1.21	342.5	0.0
S1.024	0.00	11.82	7.781	2.177	0.0	0.0	0.0	1.20	340.4	0.0
S1.025	0.00	11.91	7.743	2.177	0.0	0.0	0.0	1.21	342.5	0.0
S27.000	0.00	5.54	9.900	0.059	0.0	0.0	0.0	0.90	63.6	0.0
S27.001	0.00	5.70	9.804	0.059	0.0	0.0	0.0	0.90	63.7	0.0
S28.000	0.00	5.17	9.750	0.160	0.0	0.0	0.0	1.37	96.7	0.0

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Network Design Table for Proposed Surface Water Drainage.SWS

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
S27.002	19.316	0.064	300.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
S29.000	5.149	0.104	49.5	0.027	5.00	0.0	0.600	o	150	Pipe/Conduit	
S27.003	8.198	0.027	303.6	0.038	0.00	0.0	0.600	o	300	Pipe/Conduit	
S27.004	13.201	0.044	300.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
S1.026	11.294	0.028	400.0	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
S1.027	5.184	0.013	398.8	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S1.028	9.913	0.025	396.5	0.000	0.00	0.0	0.600	o	150	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)
S27.002	0.00	6.06	9.642	0.219	0.0	0.0	0.0	0.90	63.8	0.0
S29.000	0.00	5.06	9.700	0.027	0.0	0.0	0.0	1.43	25.3	0.0
S27.003	0.00	6.21	9.446	0.284	0.0	0.0	0.0	0.90	63.4	0.0
S27.004	0.00	6.46	9.419	0.284	0.0	0.0	0.0	0.90	63.8	0.0
S1.026	0.00	12.07	7.727	2.461	0.0	0.0	0.0	1.21	342.5	0.0
S1.027	0.00	12.24	7.698	2.461	0.0	0.0	0.0	0.50	8.8	0.0
S1.028	0.00	12.57	7.685	2.461	0.0	0.0	0.0	0.50	8.8	0.0

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Manhole Schedules for Proposed Surface Water Drainage.SWS

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)
S100	10.815	1.150	Open Manhole	1200	S1.000	9.665	150				
S101	10.681	1.425	Open Manhole	1200	S1.001	9.256	225	S1.000	9.531	150	200
S200	10.850	1.350	Open Manhole	1200	S2.000	9.500	150				
S102	10.676	1.531	Open Manhole	1200	S1.002	9.145	300	S1.001	9.220	225	
								S2.000	9.326	150	31
S103	10.647	1.668	Open Manhole	1800	S1.003	8.979	375	S1.002	9.054	300	
S104	10.682	1.804	Open Manhole	1800	S1.004	8.878	450	S1.003	8.953	375	
S300	10.800	1.350	Open Manhole	1200	S3.000	9.450	150				
S301	10.800	1.454	Open Manhole	1200	S3.001	9.346	150	S3.000	9.346	150	
S105	10.680	1.853	Open Manhole	1800	S1.005	8.827	450	S1.004	8.827	450	
								S3.001	9.298	150	171
S400	10.838	1.350	Open Manhole	1200	S4.000	9.488	150				
S106	10.679	1.881	Open Manhole	1800	S1.006	8.798	450	S1.005	8.798	450	
								S4.000	9.329	150	231
S500	10.700	1.500	Open Manhole	1200	S5.000	9.200	300				
S600	10.700	1.500	Open Manhole	1200	S6.000	9.200	300				
S501	10.700	1.674	Open Manhole	1200	S5.001	9.026	300	S5.000	9.026	300	
								S6.000	9.097	300	71
S502	10.837	2.027	Open Manhole	1200	S5.002	8.810	300	S5.001	8.810	300	
S107	10.700	2.067	Open Manhole	1800	S1.007	8.633	450	S1.006	8.742	450	109
								S5.002	8.783	300	
S700	10.809	1.350	Open Manhole	1200	S7.000	9.459	150				
S800	10.784	1.500	Open Manhole	1200	S8.000	9.284	150				
S701	10.808	1.624	Open Manhole	1200	S7.001	9.184	150	S7.000	9.288	150	104
								S8.000	9.184	150	
S108	10.688	2.144	Open Manhole	1800	S1.008	8.544	450	S1.007	8.544	450	
								S7.001	9.133	150	289
S109	10.688	2.185	Open Manhole	1800	S1.009	8.503	450	S1.008	8.503	450	
S900	10.750	1.500	Open Manhole	1200	S9.000	9.250	300				
S901	10.750	1.540	Open Manhole	1200	S9.001	9.210	300	S9.000	9.210	300	
S110	10.688	2.217	Open Manhole	1800	S1.010	8.471	450	S1.009	8.471	450	
								S9.001	9.187	300	567
S1000	10.794	1.354	Open Manhole	1200	S10.000	9.440	150				
S111	10.672	2.274	Open Manhole	1800	S1.011	8.398	450	S1.010	8.398	450	
								S10.000	9.322	150	624
S1100	10.801	1.350	Open Manhole	1200	S11.000	9.451	150				
S112	10.676	2.300	Open Manhole	1800	S1.012	8.376	450	S1.011	8.376	450	
								S11.000	9.326	150	650
S1200	10.850	1.500	Open Manhole	1200	S12.000	9.350	300				
S1201	10.850	1.515	Open Manhole	1200	S12.001	9.335	300	S12.000	9.335	300	
S113	10.710	2.376	Open Manhole	1800	S1.013	8.334	450	S1.012	8.334	450	
								S12.001	9.312	300	829
S1300	10.800	1.500	Open Manhole	1200	S13.000	9.300	300				
S1301	10.800	1.560	Open Manhole	1200	S13.001	9.240	300	S13.000	9.240	300	
S114	10.670	2.376	Open Manhole	1800	S1.014	8.294	450	S1.013	8.294	450	
								S13.001	9.110	300	666

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Manhole Schedules for Proposed Surface Water Drainage.SWS

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)
S115	10.625	2.351	Open Manhole	1800	S1.015	8.274	450	S1.014	8.274	450	
S1400	10.716	1.350	Open Manhole	1200	S14.000	9.366	150				
S1401	10.551	1.350	Open Manhole	1200	S14.001	9.201	150	S14.000	9.201	150	
S116	10.500	2.408	Open Manhole	1800	S1.016	8.092	600	S1.015	8.242	450	
								S14.001	9.154	150	613
S117	10.450	2.402	Open Manhole	1800	S1.017	8.048	600	S1.016	8.048	600	
S1500	10.700	1.350	Open Manhole	1200	S15.000	9.350	150				
S118	10.495	2.468	Open Manhole	1800	S1.018	8.027	600	S1.017	8.027	600	
								S15.000	9.145	150	668
S1600	10.850	1.350	Open Manhole	1200	S16.000	9.500	150				
S119	10.584	2.585	Open Manhole	1800	S1.019	7.999	600	S1.018	7.999	600	
								S16.000	9.334	150	885
S1700	10.870	1.500	Open Manhole	1200	S17.000	9.370	300				
S1800	10.950	1.350	Open Manhole	1200	S18.000	9.600	150				
S1701	10.999	1.720	Open Manhole	1200	S17.001	9.279	300	S17.000	9.279	300	
								S18.000	9.533	150	104
S1900	11.016	1.350	Open Manhole	1200	S19.000	9.666	150				
S1702	11.069	1.839	Open Manhole	1200	S17.002	9.230	300	S17.001	9.230	300	
								S19.000	9.599	150	219
S1703	11.203	2.050	Open Manhole	1200	S17.003	9.153	300	S17.002	9.153	300	
S2000	11.500	1.500	Open Manhole	1200	S20.000	10.000	300				
S2001	11.441	1.545	Open Manhole	1200	S20.001	9.896	300	S20.000	9.896	300	
S1704	11.318	2.209	Open Manhole	1200	S17.004	9.109	300	S17.003	9.109	300	
								S20.001	9.848	300	739
S1705	11.185	2.190	Open Manhole	1200	S17.005	8.995	300	S17.004	8.995	300	
S1706	10.925	2.082	Open Manhole	1200	S17.006	8.843	300	S17.005	8.843	300	
S120	10.708	2.748	Open Manhole	1800	S1.020	7.960	600	S1.019	7.960	600	
								S17.006	8.814	300	554
S2100	10.590	1.500	Open Manhole	1200	S21.000	9.090	300				
S2200	10.590	1.500	Open Manhole	1200	S22.000	9.090	300				
S2101	10.590	1.646	Open Manhole	1200	S21.001	8.944	300	S21.000	8.944	300	
								S22.000	9.011	300	67
S2300	10.635	1.350	Open Manhole	1200	S23.000	9.285	150				
S2102	10.590	1.809	Open Manhole	1200	S21.002	8.781	300	S21.001	8.781	300	
								S23.000	9.246	150	315
S2400	10.976	1.500	Open Manhole	1200	S24.000	9.476	300				
S121	10.793	2.872	Open Manhole	1800	S1.021	7.921	600	S1.020	7.921	600	
								S21.002	8.624	300	403
								S24.000	9.293	300	1072
S2500	10.941	1.350	Open Manhole	1200	S25.000	9.591	150				
S122	10.759	2.861	Open Manhole	1800	S1.022	7.898	600	S1.021	7.898	600	
								S25.000	9.409	150	1061
S123	10.547	2.715	Open Manhole	1800	S1.023	7.832	600	S1.022	7.832	600	
S2600	10.396	1.800	Open Manhole	1800	S26.000	8.596	600				
S2601	10.587	2.011	Open Manhole	1800	S26.001	8.576	600	S26.000	8.576	600	
S2602	10.611	2.072	Open Manhole	1800	S26.002	8.539	600	S26.001	8.539	600	

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Manhole Schedules for Proposed Surface Water Drainage.SWS

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)
S2603	10.462	1.962	Open Manhole	1800	S26.003	8.500	600	S26.002	8.500	600	
S124	10.382	2.601	Open Manhole	1800	S1.024	7.781	600	S1.023	7.781	600	
								S26.003	8.475	600	694
S125	10.885	3.142	Open Manhole		S1.025	7.743	600	S1.024	7.743	600	
S2700	11.400	1.500	Open Manhole	1200	S27.000	9.900	300				
S2701	11.400	1.596	Open Manhole	1200	S27.001	9.804	300	S27.000	9.804	300	
S2800	11.250	1.500	Open Manhole	1200	S28.000	9.750	300				
S2702	11.225	1.583	Open Manhole	1200	S27.002	9.642	300	S27.001	9.774	300	132
								S28.000	9.642	300	
S2900	11.050	1.350	Open Manhole	1200	S29.000	9.700	150				
S2703	10.930	1.484	Open Manhole		S27.003	9.446	300	S27.002	9.578	300	132
								S29.000	9.596	150	
S2704	10.902	1.483	Junction		S27.004	9.419	300	S27.003	9.419	300	
S126	10.982	3.255	Junction		S1.026	7.727	600	S1.025	7.727	600	
								S27.004	9.375	300	1348
S127	10.982	3.284	Junction	0	S1.027	7.698	150	S1.026	7.698	600	
S128	10.982	3.297	Open Manhole	1200	S1.028	7.685	150	S1.027	7.685	150	
S	10.982	3.322	Open Manhole	0		OUTFALL		S1.028	7.660	150	

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PIPELINE SCHEDULES for Proposed Surface Water Drainage.SWS

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S1.000	o	150	S100	10.815	9.665	1.000	Open Manhole	1200
S1.001	o	225	S101	10.681	9.256	1.200	Open Manhole	1200
S2.000	o	150	S200	10.850	9.500	1.200	Open Manhole	1200
S1.002	o	300	S102	10.676	9.145	1.231	Open Manhole	1200
S1.003	o	375	S103	10.647	8.979	1.293	Open Manhole	1800
S1.004	o	450	S104	10.682	8.878	1.354	Open Manhole	1800
S3.000	o	150	S300	10.800	9.450	1.200	Open Manhole	1200
S3.001	o	150	S301	10.800	9.346	1.304	Open Manhole	1200
S1.005	o	450	S105	10.680	8.827	1.403	Open Manhole	1800
S4.000	o	150	S400	10.838	9.488	1.200	Open Manhole	1200
S1.006	o	450	S106	10.679	8.798	1.431	Open Manhole	1800
S5.000	o	300	S500	10.700	9.200	1.200	Open Manhole	1200
S6.000	o	300	S600	10.700	9.200	1.200	Open Manhole	1200
S5.001	o	300	S501	10.700	9.026	1.374	Open Manhole	1200
S5.002	o	300	S502	10.837	8.810	1.727	Open Manhole	1200
S1.007	o	450	S107	10.700	8.633	1.617	Open Manhole	1800

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S1.000	6.605	49.3	S101	10.681	9.531	1.000	Open Manhole	1200
S1.001	8.175	227.1	S102	10.676	9.220	1.231	Open Manhole	1200
S2.000	6.614	38.0	S102	10.676	9.326	1.200	Open Manhole	1200
S1.002	27.402	301.1	S103	10.647	9.054	1.293	Open Manhole	1800
S1.003	8.451	325.0	S104	10.682	8.953	1.354	Open Manhole	1800
S1.004	20.208	396.2	S105	10.680	8.827	1.403	Open Manhole	1800
S3.000	15.589	150.0	S301	10.800	9.346	1.304	Open Manhole	1200
S3.001	7.243	150.0	S105	10.680	9.298	1.232	Open Manhole	1800
S1.005	11.703	403.6	S106	10.679	8.798	1.431	Open Manhole	1800
S4.000	5.907	37.2	S106	10.679	9.329	1.200	Open Manhole	1800
S1.006	22.310	398.4	S107	10.700	8.742	1.508	Open Manhole	1800
S5.000	52.228	300.0	S501	10.700	9.026	1.374	Open Manhole	1200
S6.000	30.872	299.7	S501	10.700	9.097	1.303	Open Manhole	1200
S5.001	64.862	300.3	S502	10.837	8.810	1.727	Open Manhole	1200
S5.002	8.229	304.8	S107	10.700	8.783	1.617	Open Manhole	1800
S1.007	35.551	399.4	S108	10.688	8.544	1.694	Open Manhole	1800

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PIPELINE SCHEDULES for Proposed Surface Water Drainage.SWS

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S7.000	o	150	S700	10.809	9.459	1.200	Open Manhole	1200
S8.000	o	150	S800	10.784	9.284	1.350	Open Manhole	1200
S7.001	o	150	S701	10.808	9.184	1.474	Open Manhole	1200
S1.008	o	450	S108	10.688	8.544	1.694	Open Manhole	1800
S1.009	o	450	S109	10.688	8.503	1.735	Open Manhole	1800
S9.000	o	300	S900	10.750	9.250	1.200	Open Manhole	1200
S9.001	o	300	S901	10.750	9.210	1.240	Open Manhole	1200
S1.010	o	450	S110	10.688	8.471	1.767	Open Manhole	1800
S10.000	o	150	S1000	10.794	9.440	1.204	Open Manhole	1200
S1.011	o	450	S111	10.672	8.398	1.824	Open Manhole	1800
S11.000	o	150	S1100	10.801	9.451	1.200	Open Manhole	1200
S1.012	o	450	S112	10.676	8.376	1.850	Open Manhole	1800
S12.000	o	300	S1200	10.850	9.350	1.200	Open Manhole	1200
S12.001	o	300	S1201	10.850	9.335	1.215	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S7.000	25.648	150.0	S701	10.808	9.288	1.370	Open Manhole	1200
S8.000	14.938	150.0	S701	10.808	9.184	1.474	Open Manhole	1200
S7.001	7.745	150.0	S108	10.688	9.133	1.405	Open Manhole	1800
S1.008	16.572	404.2	S109	10.688	8.503	1.735	Open Manhole	1800
S1.009	12.879	400.0	S110	10.688	8.471	1.767	Open Manhole	1800
S9.000	11.921	300.0	S901	10.750	9.210	1.240	Open Manhole	1200
S9.001	5.175	225.0	S110	10.688	9.187	1.201	Open Manhole	1800
S1.010	29.276	401.0	S111	10.672	8.398	1.824	Open Manhole	1800
S10.000	7.166	60.7	S111	10.672	9.322	1.200	Open Manhole	1800
S1.011	8.575	400.0	S112	10.676	8.376	1.850	Open Manhole	1800
S11.000	8.174	65.4	S112	10.676	9.326	1.200	Open Manhole	1800
S1.012	17.101	400.0	S113	10.710	8.334	1.926	Open Manhole	1800
S12.000	4.466	297.7	S1201	10.850	9.335	1.215	Open Manhole	1200
S12.001	6.770	300.0	S113	10.710	9.312	1.098	Open Manhole	1800

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PIPELINE SCHEDULES for Proposed Surface Water Drainage.SWS

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S1.013	o	450	S113	10.710	8.334	1.926	Open Manhole	1800
S13.000	o	300	S1300	10.800	9.300	1.200	Open Manhole	1200
S13.001	o	300	S1301	10.800	9.240	1.260	Open Manhole	1200
S1.014	o	450	S114	10.670	8.294	1.926	Open Manhole	1800
S1.015	o	450	S115	10.625	8.274	1.901	Open Manhole	1800
S14.000	o	150	S1400	10.716	9.366	1.200	Open Manhole	1200
S14.001	o	150	S1401	10.551	9.201	1.200	Open Manhole	1200
S1.016	o	600	S116	10.500	8.092	1.808	Open Manhole	1800
S1.017	o	600	S117	10.450	8.048	1.802	Open Manhole	1800
S15.000	o	150	S1500	10.700	9.350	1.200	Open Manhole	1200
S1.018	o	600	S118	10.495	8.027	1.868	Open Manhole	1800
S16.000	o	150	S1600	10.850	9.500	1.200	Open Manhole	1200
S1.019	o	600	S119	10.584	7.999	1.985	Open Manhole	1800
S17.000	o	300	S1700	10.870	9.370	1.200	Open Manhole	1200
S18.000	o	150	S1800	10.950	9.600	1.200	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S1.013	15.872	396.8	S114	10.670	8.294	1.926	Open Manhole	1800
S13.000	18.120	300.0	S1301	10.800	9.240	1.260	Open Manhole	1200
S13.001	7.364	56.6	S114	10.670	9.110	1.260	Open Manhole	1800
S1.014	7.697	400.0	S115	10.625	8.274	1.901	Open Manhole	1800
S1.015	13.038	400.0	S116	10.500	8.242	1.808	Open Manhole	1800
S14.000	7.351	44.6	S1401	10.551	9.201	1.200	Open Manhole	1200
S14.001	4.809	103.0	S116	10.500	9.154	1.196	Open Manhole	1800
S1.016	17.713	402.6	S117	10.450	8.048	1.802	Open Manhole	1800
S1.017	8.189	400.0	S118	10.495	8.027	1.868	Open Manhole	1800
S15.000	7.072	34.5	S118	10.495	9.145	1.200	Open Manhole	1800
S1.018	11.111	400.0	S119	10.584	7.999	1.985	Open Manhole	1800
S16.000	7.039	42.4	S119	10.584	9.334	1.100	Open Manhole	1800
S1.019	15.581	399.5	S120	10.708	7.960	2.148	Open Manhole	1800
S17.000	27.345	300.0	S1701	10.999	9.279	1.420	Open Manhole	1200
S18.000	6.880	102.7	S1701	10.999	9.533	1.316	Open Manhole	1200

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PIPELINE SCHEDULES for Proposed Surface Water Drainage.SWS

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S17.001	o	300	S1701	10.999	9.279	1.420	Open Manhole	1200
S19.000	o	150	S1900	11.016	9.666	1.200	Open Manhole	1200
S17.002	o	300	S1702	11.069	9.230	1.539	Open Manhole	1200
S17.003	o	300	S1703	11.203	9.153	1.750	Open Manhole	1200
S20.000	o	300	S2000	11.500	10.000	1.200	Open Manhole	1200
S20.001	o	300	S2001	11.441	9.896	1.245	Open Manhole	1200
S17.004	o	300	S1704	11.318	9.109	1.909	Open Manhole	1200
S17.005	o	300	S1705	11.185	8.995	1.890	Open Manhole	1200
S17.006	o	300	S1706	10.925	8.843	1.782	Open Manhole	1200
S1.020	o	600	S120	10.708	7.960	2.148	Open Manhole	1800
S21.000	o	300	S2100	10.590	9.090	1.200	Open Manhole	1200
S22.000	o	300	S2200	10.590	9.090	1.200	Open Manhole	1200
S21.001	o	300	S2101	10.590	8.944	1.346	Open Manhole	1200
S23.000	o	150	S2300	10.635	9.285	1.200	Open Manhole	1200
S21.002	o	300	S2102	10.590	8.781	1.509	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S17.001	14.574	300.0	S1702	11.069	9.230	1.539	Open Manhole	1200
S19.000	6.921	103.3	S1702	11.069	9.599	1.320	Open Manhole	1200
S17.002	23.173	300.0	S1703	11.203	9.153	1.750	Open Manhole	1200
S17.003	13.192	299.8	S1704	11.318	9.109	1.909	Open Manhole	1200
S20.000	31.338	300.0	S2001	11.441	9.896	1.245	Open Manhole	1200
S20.001	14.157	300.0	S1704	11.318	9.848	1.170	Open Manhole	1200
S17.004	34.178	299.8	S1705	11.185	8.995	1.890	Open Manhole	1200
S17.005	45.542	299.6	S1706	10.925	8.843	1.782	Open Manhole	1200
S17.006	8.691	300.0	S120	10.708	8.814	1.594	Open Manhole	1800
S1.020	15.710	400.0	S121	10.793	7.921	2.272	Open Manhole	1800
S21.000	43.926	300.9	S2101	10.590	8.944	1.346	Open Manhole	1200
S22.000	23.581	298.5	S2101	10.590	9.011	1.279	Open Manhole	1200
S21.001	48.975	300.5	S2102	10.590	8.781	1.509	Open Manhole	1200
S23.000	5.807	150.0	S2102	10.590	9.246	1.194	Open Manhole	1200
S21.002	16.134	102.8	S121	10.793	8.624	1.869	Open Manhole	1800

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PIPELINE SCHEDULES for Proposed Surface Water Drainage.SWS

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S24.000	o	300	S2400	10.976	9.476	1.200	Open Manhole	1200
S1.021	o	600	S121	10.793	7.921	2.272	Open Manhole	1800
S25.000	o	150	S2500	10.941	9.591	1.200	Open Manhole	1200
S1.022	o	600	S122	10.759	7.898	2.261	Open Manhole	1800
S1.023	o	600	S123	10.547	7.832	2.115	Open Manhole	1800
S26.000	o	600	S2600	10.396	8.596	1.200	Open Manhole	1800
S26.001	o	600	S2601	10.587	8.576	1.411	Open Manhole	1800
S26.002	o	600	S2602	10.611	8.539	1.472	Open Manhole	1800
S26.003	o	600	S2603	10.462	8.500	1.362	Open Manhole	1800
S1.024	o	600	S124	10.382	7.781	2.001	Open Manhole	1800
S1.025	o	600	S125	10.885	7.743	2.542	Open Manhole	1800
S27.000	o	300	S2700	11.400	9.900	1.200	Open Manhole	1200
S27.001	o	300	S2701	11.400	9.804	1.296	Open Manhole	1200
S28.000	o	300	S2800	11.250	9.750	1.200	Open Manhole	1200
S27.002	o	300	S2702	11.225	9.642	1.283	Open Manhole	1200
S29.000	o	150	S2900	11.050	9.700	1.200	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S24.000	7.676	41.9	S121	10.793	9.293	1.200	Open Manhole	1800
S1.021	9.115	400.0	S122	10.759	7.898	2.261	Open Manhole	1800
S25.000	6.727	37.0	S122	10.759	9.409	1.200	Open Manhole	1800
S1.022	26.459	400.0	S123	10.547	7.832	2.115	Open Manhole	1800
S1.023	20.279	397.6	S124	10.382	7.781	2.001	Open Manhole	1800
S26.000	8.141	407.1	S2601	10.587	8.576	1.411	Open Manhole	1800
S26.001	14.640	400.0	S2602	10.611	8.539	1.472	Open Manhole	1800
S26.002	15.784	400.0	S2603	10.462	8.500	1.362	Open Manhole	1800
S26.003	9.953	400.0	S124	10.382	8.475	1.307	Open Manhole	1800
S1.024	15.384	404.8	S125	10.885	7.743	2.542	Open Manhole	1800
S1.025	6.646	400.0	S126	10.982	7.727	2.655	Junction	
S27.000	28.933	301.4	S2701	11.400	9.804	1.296	Open Manhole	1200
S27.001	9.035	301.2	S2702	11.225	9.774	1.151	Open Manhole	1200
S28.000	14.229	131.8	S2702	11.225	9.642	1.283	Open Manhole	1200
S27.002	19.316	300.0	S2703	10.930	9.578	1.052	Open Manhole	1200
S29.000	5.149	49.5	S2703	10.930	9.596	1.184	Open Manhole	1200

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PIPELINE SCHEDULES for Proposed Surface Water Drainage.SWS

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S27.003	o	300	S2703	10.930	9.446	1.184	Open Manhole	1200
S27.004	o	300	S2704	10.902	9.419	1.183	Junction	
S1.026	o	600	S126	10.982	7.727	2.655	Junction	
S1.027	o	150	S127	10.982	7.698	3.134	Junction	
S1.028	o	150	S128	10.982	7.685	3.147	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S27.003	8.198	303.6	S2704	10.902	9.419	1.183	Junction	
S27.004	13.201	300.0	S126	10.982	9.375	1.307	Junction	
S1.026	11.294	400.0	S127	10.982	7.698	2.684	Junction	
S1.027	5.184	398.8	S128	10.982	7.685	3.147	Open Manhole	1200
S1.028	9.913	396.5	S	10.982	7.660	3.172	Open Manhole	0

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Area Summary for Proposed Surface Water Drainage.SWS

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	-	-	100	0.026	0.026	0.026
1.001	-	-	100	0.028	0.028	0.028
2.000	-	-	100	0.018	0.018	0.018
1.002	-	-	100	0.025	0.025	0.025
1.003	-	-	100	0.000	0.000	0.000
1.004	-	-	100	0.032	0.032	0.032
3.000	-	-	100	0.050	0.050	0.050
3.001	-	-	100	0.000	0.000	0.000
1.005	-	-	100	0.000	0.000	0.000
4.000	-	-	100	0.025	0.025	0.025
1.006	-	-	100	0.025	0.025	0.025
5.000	-	-	100	0.082	0.082	0.082
6.000	-	-	100	0.047	0.047	0.047
5.001	-	-	100	0.102	0.102	0.102
5.002	-	-	100	0.000	0.000	0.000
1.007	-	-	100	0.028	0.028	0.028
7.000	-	-	100	0.030	0.030	0.030
8.000	-	-	100	0.014	0.014	0.014
7.001	-	-	100	0.050	0.050	0.050
1.008	-	-	100	0.028	0.028	0.028
1.009	-	-	100	0.000	0.000	0.000
9.000	-	-	100	0.093	0.093	0.093
9.001	-	-	100	0.000	0.000	0.000
1.010	-	-	100	0.030	0.030	0.030
10.000	-	-	100	0.090	0.090	0.090
1.011	-	-	100	0.000	0.000	0.000
11.000	-	-	100	0.008	0.008	0.008
1.012	-	-	100	0.000	0.000	0.000
12.000	-	-	100	0.050	0.050	0.050
12.001	-	-	100	0.000	0.000	0.000
1.013	-	-	100	0.034	0.034	0.034
13.000	-	-	100	0.055	0.055	0.055
13.001	-	-	100	0.000	0.000	0.000
1.014	-	-	100	0.000	0.000	0.000
1.015	-	-	100	0.000	0.000	0.000
14.000	-	-	100	0.009	0.009	0.009
14.001	-	-	100	0.000	0.000	0.000
1.016	-	-	100	0.067	0.067	0.067
1.017	-	-	100	0.000	0.000	0.000
15.000	-	-	100	0.010	0.010	0.010
1.018	-	-	100	0.000	0.000	0.000
16.000	-	-	100	0.000	0.000	0.000
1.019	-	-	100	0.030	0.030	0.030
17.000	-	-	100	0.040	0.040	0.040
18.000	-	-	100	0.037	0.037	0.037
17.001	-	-	100	0.012	0.012	0.012
19.000	-	-	100	0.036	0.036	0.036
17.002	-	-	100	0.033	0.033	0.033
17.003	-	-	100	0.010	0.010	0.010
20.000	-	-	100	0.050	0.050	0.050
20.001	-	-	100	0.014	0.014	0.014
17.004	-	-	100	0.038	0.038	0.038
17.005	-	-	100	0.098	0.098	0.098
17.006	-	-	100	0.000	0.000	0.000
1.020	-	-	100	0.000	0.000	0.000
21.000	-	-	100	0.079	0.079	0.079
22.000	-	-	100	0.043	0.043	0.043
21.001	-	-	100	0.066	0.066	0.066
23.000	-	-	100	0.048	0.048	0.048
21.002	-	-	100	0.000	0.000	0.000
24.000	-	-	100	0.170	0.170	0.170
1.021	-	-	100	0.000	0.000	0.000

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Area Summary for Proposed Surface Water Drainage.SWS

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
25.000	-	-	100	0.010	0.010	0.010
1.022	-	-	100	0.000	0.000	0.000
1.023	-	-	100	0.028	0.028	0.028
26.000	-	-	100	0.043	0.043	0.043
26.001	-	-	100	0.150	0.150	0.150
26.002	-	-	100	0.029	0.029	0.029
26.003	-	-	100	0.000	0.000	0.000
1.024	-	-	100	0.057	0.057	0.057
1.025	-	-	100	0.000	0.000	0.000
27.000	-	-	100	0.059	0.059	0.059
27.001	-	-	100	0.000	0.000	0.000
28.000	-	-	100	0.160	0.160	0.160
27.002	-	-	100	0.000	0.000	0.000
29.000	-	-	100	0.027	0.027	0.027
27.003	-	-	100	0.038	0.038	0.038
27.004	-	-	100	0.000	0.000	0.000
1.026	-	-	100	0.000	0.000	0.000
1.027	-	-	100	0.000	0.000	0.000
1.028	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				2.461	2.461	2.461

Free Flowing Outfall Details for Proposed Surface Water Drainage.SWS

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
S1.028	S	10.982	7.660	0.000	0	0

Simulation Criteria for Proposed Surface Water Drainage.SWS

Volumetric Runoff Coeff	0.750	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	12	Number of Storage Structures	36	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FEH	Summer Storms	Yes
Return Period (years)	2	Winter Storms	Yes
FEH Rainfall Version	2013	Cv (Summer)	0.750
Site Location	GB 473800 105650 SU 73800 05650	Cv (Winter)	0.840
Data Type	Catchment	Storm Duration (mins)	30

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Online Controls for Proposed Surface Water Drainage.SWS

Orifice Manhole: S301, DS/PN: S3.001, Volume (m³): 1.9

Diameter (m) 0.100 Discharge Coefficient 0.600 Invert Level (m) 9.346

Orifice Manhole: S701, DS/PN: S7.001, Volume (m³): 2.5

Diameter (m) 0.100 Discharge Coefficient 0.600 Invert Level (m) 9.184

Orifice Manhole: S901, DS/PN: S9.001, Volume (m³): 2.5

Diameter (m) 0.100 Discharge Coefficient 0.600 Invert Level (m) 9.210

Orifice Manhole: S1201, DS/PN: S12.001, Volume (m³): 1.9

Diameter (m) 0.100 Discharge Coefficient 0.600 Invert Level (m) 9.335

Orifice Manhole: S1301, DS/PN: S13.001, Volume (m³): 3.0

Diameter (m) 0.100 Discharge Coefficient 0.600 Invert Level (m) 9.240

Orifice Manhole: S1701, DS/PN: S17.001, Volume (m³): 3.9

Diameter (m) 0.100 Discharge Coefficient 0.600 Invert Level (m) 9.279

Orifice Manhole: S1702, DS/PN: S17.002, Volume (m³): 3.1

Diameter (m) 0.100 Discharge Coefficient 0.600 Invert Level (m) 9.230

Orifice Manhole: S1703, DS/PN: S17.003, Volume (m³): 3.9

Diameter (m) 0.100 Discharge Coefficient 0.600 Invert Level (m) 9.153

Orifice Manhole: S1704, DS/PN: S17.004, Volume (m³): 4.3

Diameter (m) 0.100 Discharge Coefficient 0.600 Invert Level (m) 9.109

Orifice Manhole: S1705, DS/PN: S17.005, Volume (m³): 4.8

Diameter (m) 0.100 Discharge Coefficient 0.600 Invert Level (m) 8.995

Orifice Manhole: S1706, DS/PN: S17.006, Volume (m³): 5.5

Diameter (m) 0.100 Discharge Coefficient 0.600 Invert Level (m) 8.843

Pump Manhole: S127, DS/PN: S1.027, Volume (m³): 3.2

Invert Level (m) 7.698

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	12.3000	0.700	12.3000	1.300	12.3000	1.900	12.3000	2.500	12.3000
0.200	12.3000	0.800	12.3000	1.400	12.3000	2.000	12.3000	2.600	12.3000
0.300	12.3000	0.900	12.3000	1.500	12.3000	2.100	12.3000	2.700	12.3000
0.400	12.3000	1.000	12.3000	1.600	12.3000	2.200	12.3000	2.800	12.3000
0.500	12.3000	1.100	12.3000	1.700	12.3000	2.300	12.3000	2.900	12.3000
0.600	12.3000	1.200	12.3000	1.800	12.3000	2.400	12.3000	3.000	12.3000

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Storage Structures for Proposed Surface Water Drainage.SWS

Porous Car Park Manhole: S100, DS/PN: S1.000

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	6.1
Membrane Percolation (mm/hr)	1000	Length (m)	16.2
Max Percolation (l/s)	27.5	Slope (1:X)	100000.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	10.335	Membrane Depth (mm)	130

Porous Car Park Manhole: S200, DS/PN: S2.000

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	3.5
Membrane Percolation (mm/hr)	1000	Length (m)	13.9
Max Percolation (l/s)	13.5	Slope (1:X)	100000.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	10.370	Membrane Depth (mm)	130

Porous Car Park Manhole: S301, DS/PN: S3.001

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	23.0
Membrane Percolation (mm/hr)	1000	Length (m)	15.2
Max Percolation (l/s)	97.1	Slope (1:X)	100000.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	10.420	Membrane Depth (mm)	130

Porous Car Park Manhole: S400, DS/PN: S4.000

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	6.0
Membrane Percolation (mm/hr)	1000	Length (m)	14.9
Max Percolation (l/s)	24.8	Slope (1:X)	100000.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	10.358	Membrane Depth (mm)	130

Complex Manhole: S501, DS/PN: S5.001

Infiltration Trench

Infiltration Coefficient Base (m/hr)	0.00000	Trench Width (m)	0.6
Infiltration Coefficient Side (m/hr)	0.00000	Trench Length (m)	52.5
Safety Factor	2.0	Slope (1:X)	300.0
Porosity	0.30	Cap Volume Depth (m)	0.995
Invert Level (m)	9.225	Cap Infiltration Depth (m)	0.000

Infiltration Trench

Infiltration Coefficient Base (m/hr)	0.00000	Trench Width (m)	0.6
Infiltration Coefficient Side (m/hr)	0.00000	Trench Length (m)	30.8
Safety Factor	2.0	Slope (1:X)	308.0
Porosity	0.30	Cap Volume Depth (m)	0.920
Invert Level (m)	9.300	Cap Infiltration Depth (m)	0.000

Porous Car Park

Infiltration Coefficient Base (m/hr)	0.00000	Max Percolation (l/s)	73.6
Membrane Percolation (mm/hr)	1000	Safety Factor	2.0

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Porous Car Park

Porosity	0.30	Slope (1:X)	100000.0
Invert Level (m)	10.220	Depression Storage (mm)	5
Width (m)	8.6	Evaporation (mm/day)	3
Length (m)	30.8	Membrane Depth (mm)	130

Porous Car Park

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	7.2
Membrane Percolation (mm/hr)	1000	Length (m)	52.5
Max Percolation (l/s)	105.0	Slope (1:X)	100000.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	10.220	Membrane Depth (mm)	130

Complex Manhole: S502, DS/PN: S5.002

Infiltration Trench

Infiltration Coefficient Base (m/hr)	0.00000	Trench Width (m)	0.6
Infiltration Coefficient Side (m/hr)	0.00000	Trench Length (m)	64.9
Safety Factor	2.0	Slope (1:X)	300.0
Porosity	0.30	Cap Volume Depth (m)	1.348
Invert Level (m)	9.009	Cap Infiltration Depth (m)	0.000

Porous Car Park

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	4.8
Membrane Percolation (mm/hr)	1000	Length (m)	64.9
Max Percolation (l/s)	86.5	Slope (1:X)	300.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	10.357	Membrane Depth (mm)	130

Complex Manhole: S701, DS/PN: S7.001

Infiltration Trench

Infiltration Coefficient Base (m/hr)	0.00000	Trench Width (m)	0.6
Infiltration Coefficient Side (m/hr)	0.00000	Trench Length (m)	25.6
Safety Factor	2.0	Slope (1:X)	300.0
Porosity	0.30	Cap Volume Depth (m)	1.104
Invert Level (m)	9.224	Cap Infiltration Depth (m)	0.000

Infiltration Trench

Infiltration Coefficient Base (m/hr)	0.00000	Trench Width (m)	0.6
Infiltration Coefficient Side (m/hr)	0.00000	Trench Length (m)	14.9
Safety Factor	2.0	Slope (1:X)	300.0
Porosity	0.30	Cap Volume Depth (m)	1.094
Invert Level (m)	9.234	Cap Infiltration Depth (m)	0.000

Porous Car Park

Infiltration Coefficient Base (m/hr)	0.00000	Invert Level (m)	10.328
Membrane Percolation (mm/hr)	1000	Width (m)	3.4
Max Percolation (l/s)	14.1	Length (m)	14.9
Safety Factor	2.0	Slope (1:X)	100000.0
Porosity	0.30	Depression Storage (mm)	5

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Porous Car Park

Evaporation (mm/day) 3 Membrane Depth (mm) 130

Porous Car Park

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	7.7
Membrane Percolation (mm/hr)	1000	Length (m)	27.6
Max Percolation (l/s)	59.0	Slope (1:X)	100000.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	10.328	Membrane Depth (mm)	130

Porous Car Park

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	3.9
Membrane Percolation (mm/hr)	1000	Length (m)	25.6
Max Percolation (l/s)	27.7	Slope (1:X)	100000.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	10.328	Membrane Depth (mm)	130

Porous Car Park Manhole: S901, DS/PN: S9.001

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	22.7
Membrane Percolation (mm/hr)	1000	Length (m)	21.7
Max Percolation (l/s)	136.8	Slope (1:X)	0.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	10.270	Membrane Depth (mm)	130

Porous Car Park Manhole: S1000, DS/PN: S10.000

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	3.6
Membrane Percolation (mm/hr)	1000	Length (m)	12.3
Max Percolation (l/s)	12.3	Slope (1:X)	123.5
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	10.315	Membrane Depth (mm)	130

Porous Car Park Manhole: S1100, DS/PN: S11.000

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	5.0
Membrane Percolation (mm/hr)	1000	Length (m)	10.4
Max Percolation (l/s)	14.4	Slope (1:X)	0.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	10.321	Membrane Depth (mm)	130

Porous Car Park Manhole: S1201, DS/PN: S12.001

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	8.8
Membrane Percolation (mm/hr)	1000	Length (m)	24.9
Max Percolation (l/s)	60.9	Slope (1:X)	0.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	10.370	Membrane Depth (mm)	130

Porous Car Park Manhole: S1301, DS/PN: S13.001

Infiltration Coefficient Base (m/hr)	0.00000	Safety Factor	2.0
Membrane Percolation (mm/hr)	1000	Porosity	0.30
Max Percolation (l/s)	66.2	Invert Level (m)	10.320

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Porous Car Park Manhole: S1301, DS/PN: S13.001

Width (m)	8.8	Depression Storage (mm)	5
Length (m)	27.1	Evaporation (mm/day)	3
Slope (1:X)	0.0	Membrane Depth (mm)	130

Porous Car Park Manhole: S1400, DS/PN: S14.000

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	3.5
Membrane Percolation (mm/hr)	1000	Length (m)	11.5
Max Percolation (l/s)	11.2	Slope (1:X)	230.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	10.236	Membrane Depth (mm)	130

Porous Car Park Manhole: S1500, DS/PN: S15.000

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	3.2
Membrane Percolation (mm/hr)	1000	Length (m)	13.6
Max Percolation (l/s)	12.1	Slope (1:X)	272.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	10.220	Membrane Depth (mm)	130

Porous Car Park Manhole: S1600, DS/PN: S16.000

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	12.3
Membrane Percolation (mm/hr)	1000	Length (m)	6.3
Max Percolation (l/s)	21.5	Slope (1:X)	126.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	10.370	Membrane Depth (mm)	130

Porous Car Park Manhole: S1700, DS/PN: S17.000

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	11.2
Membrane Percolation (mm/hr)	1000	Length (m)	27.3
Max Percolation (l/s)	84.9	Slope (1:X)	227.5
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	10.390	Membrane Depth (mm)	130

Porous Car Park Manhole: S1800, DS/PN: S18.000

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	4.3
Membrane Percolation (mm/hr)	1000	Length (m)	20.1
Max Percolation (l/s)	24.0	Slope (1:X)	402.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	10.470	Membrane Depth (mm)	130

Complex Manhole: S1701, DS/PN: S17.001

Infiltration Trench

Infiltration Coefficient Base (m/hr)	0.00000	Trench Width (m)	0.6
Infiltration Coefficient Side (m/hr)	0.00000	Trench Length (m)	27.3
Safety Factor	2.0	Slope (1:X)	300.0
Porosity	0.30	Cap Volume Depth (m)	1.111
Invert Level (m)	9.279	Cap Infiltration Depth (m)	0.000

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Porous Car Park

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	5.8
Membrane Percolation (mm/hr)	1000	Length (m)	14.6
Max Percolation (l/s)	23.5	Slope (1:X)	184.8
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	10.510	Membrane Depth (mm)	130

Porous Car Park Manhole: S1900, DS/PN: S19.000

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	8.8
Membrane Percolation (mm/hr)	1000	Length (m)	14.6
Max Percolation (l/s)	35.7	Slope (1:X)	0.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	10.536	Membrane Depth (mm)	130

Complex Manhole: S1702, DS/PN: S17.002

Infiltration Trench

Infiltration Coefficient Base (m/hr)	0.00000	Trench Width (m)	0.6
Infiltration Coefficient Side (m/hr)	0.00000	Trench Length (m)	14.6
Safety Factor	2.0	Slope (1:X)	298.0
Porosity	0.30	Cap Volume Depth (m)	1.280
Invert Level (m)	9.230	Cap Infiltration Depth (m)	0.000

Porous Car Park

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	7.0
Membrane Percolation (mm/hr)	1000	Length (m)	23.2
Max Percolation (l/s)	45.1	Slope (1:X)	173.1
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	10.589	Membrane Depth (mm)	0

Complex Manhole: S1703, DS/PN: S17.003

Porous Car Park

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	5.6
Membrane Percolation (mm/hr)	1000	Length (m)	13.2
Max Percolation (l/s)	20.5	Slope (1:X)	114.8
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	9.153	Membrane Depth (mm)	130

Infiltration Trench

Infiltration Coefficient Base (m/hr)	0.00000	Trench Width (m)	0.6
Infiltration Coefficient Side (m/hr)	0.00000	Trench Length (m)	23.2
Safety Factor	2.0	Slope (1:X)	300.0
Porosity	0.30	Cap Volume Depth (m)	1.436
Invert Level (m)	7.583	Cap Infiltration Depth (m)	0.000

Complex Manhole: S2001, DS/PN: S20.001

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Porous Car Park

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	10.1
Membrane Percolation (mm/hr)	1000	Length (m)	31.3
Max Percolation (l/s)	87.8	Slope (1:X)	530.5
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	9.896	Membrane Depth (mm)	130

Infiltration Trench

Infiltration Coefficient Base (m/hr)	0.00000	Trench Width (m)	0.6
Infiltration Coefficient Side (m/hr)	0.00000	Trench Length (m)	31.3
Safety Factor	2.0	Slope (1:X)	301.0
Porosity	0.30	Cap Volume Depth (m)	1.065
Invert Level (m)	8.831	Cap Infiltration Depth (m)	0.000

Complex Manhole: S1704, DS/PN: S17.004

Infiltration Trench

Infiltration Coefficient Base (m/hr)	0.00000	Trench Width (m)	0.6
Infiltration Coefficient Side (m/hr)	0.00000	Trench Length (m)	13.2
Safety Factor	2.0	Slope (1:X)	300.0
Porosity	0.30	Cap Volume Depth (m)	1.614
Invert Level (m)	9.109	Cap Infiltration Depth (m)	0.000

Infiltration Trench

Infiltration Coefficient Base (m/hr)	0.00000	Trench Width (m)	0.6
Infiltration Coefficient Side (m/hr)	0.00000	Trench Length (m)	14.2
Safety Factor	2.0	Slope (1:X)	302.1
Porosity	0.30	Cap Volume Depth (m)	1.469
Invert Level (m)	9.849	Cap Infiltration Depth (m)	0.000

Porous Car Park

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	7.4
Membrane Percolation (mm/hr)	1000	Length (m)	14.2
Max Percolation (l/s)	29.2	Slope (1:X)	115.4
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	10.838	Membrane Depth (mm)	130

Complex Manhole: S1705, DS/PN: S17.005

Porous Car Park

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	5.7
Membrane Percolation (mm/hr)	1000	Length (m)	34.2
Max Percolation (l/s)	54.2	Slope (1:X)	257.1
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	10.705	Membrane Depth (mm)	130

Infiltration Trench

Infiltration Coefficient Base (m/hr)	0.00000	Porosity	0.30
Infiltration Coefficient Side (m/hr)	0.00000	Invert Level (m)	8.995
Safety Factor	2.0	Trench Width (m)	0.6

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Infiltration Trench

Trench Length (m)	34.2	Cap Volume Depth (m)	1.710
Slope (1:X)	300.0	Cap Infiltration Depth (m)	0.000

Complex Manhole: S1706, DS/PN: S17.006

Porous Car Park

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	10.3
Membrane Percolation (mm/hr)	1000	Length (m)	45.5
Max Percolation (l/s)	130.2	Slope (1:X)	175.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	10.445	Membrane Depth (mm)	130

Infiltration Trench

Infiltration Coefficient Base (m/hr)	0.00000	Trench Width (m)	0.6
Infiltration Coefficient Side (m/hr)	0.00000	Trench Length (m)	45.5
Safety Factor	2.0	Slope (1:X)	300.0
Porosity	0.30	Cap Volume Depth (m)	1.602
Invert Level (m)	8.843	Cap Infiltration Depth (m)	0.000

Complex Manhole: S2101, DS/PN: S21.001

Porous Car Park

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	8.5
Membrane Percolation (mm/hr)	1000	Length (m)	23.6
Max Percolation (l/s)	55.7	Slope (1:X)	0.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	8.944	Membrane Depth (mm)	130

Infiltration Trench

Infiltration Coefficient Base (m/hr)	0.00000	Trench Width (m)	0.6
Infiltration Coefficient Side (m/hr)	0.00000	Trench Length (m)	43.9
Safety Factor	2.0	Slope (1:X)	300.0
Porosity	0.30	Cap Volume Depth (m)	1.166
Invert Level (m)	8.944	Cap Infiltration Depth (m)	0.000

Infiltration Trench

Infiltration Coefficient Base (m/hr)	0.00000	Trench Width (m)	0.6
Infiltration Coefficient Side (m/hr)	0.00000	Trench Length (m)	23.6
Safety Factor	2.0	Slope (1:X)	300.0
Porosity	0.30	Cap Volume Depth (m)	1.579
Invert Level (m)	9.011	Cap Infiltration Depth (m)	0.000

Porous Car Park

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	7.8
Membrane Percolation (mm/hr)	1000	Length (m)	43.9
Max Percolation (l/s)	95.1	Slope (1:X)	0.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	10.110	Membrane Depth (mm)	130

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Porous Car Park Manhole: S2300, DS/PN: S23.000

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	9.7
Membrane Percolation (mm/hr)	1000	Length (m)	25.0
Max Percolation (l/s)	67.4	Slope (1:X)	0.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	10.155	Membrane Depth (mm)	130

Complex Manhole: S2102, DS/PN: S21.002

Porous Car Park

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	6.6
Membrane Percolation (mm/hr)	1000	Length (m)	49.0
Max Percolation (l/s)	89.8	Slope (1:X)	0.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	10.110	Membrane Depth (mm)	130

Infiltration Trench

Infiltration Coefficient Base (m/hr)	0.00000	Trench Width (m)	0.6
Infiltration Coefficient Side (m/hr)	0.00000	Trench Length (m)	49.0
Safety Factor	2.0	Slope (1:X)	300.0
Porosity	0.30	Cap Volume Depth (m)	1.329
Invert Level (m)	8.781	Cap Infiltration Depth (m)	0.000

Porous Car Park Manhole: S2400, DS/PN: S24.000

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	3.3
Membrane Percolation (mm/hr)	1000	Length (m)	12.0
Max Percolation (l/s)	11.0	Slope (1:X)	0.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	10.496	Membrane Depth (mm)	130

Porous Car Park Manhole: S2500, DS/PN: S25.000

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	3.3
Membrane Percolation (mm/hr)	1000	Length (m)	12.0
Max Percolation (l/s)	11.0	Slope (1:X)	0.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	10.461	Membrane Depth (mm)	130

Porous Car Park Manhole: S2600, DS/PN: S26.000

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	9.3
Membrane Percolation (mm/hr)	1000	Length (m)	17.8
Max Percolation (l/s)	46.0	Slope (1:X)	0.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	9.916	Membrane Depth (mm)	130

Porous Car Park Manhole: S2602, DS/PN: S26.002

Infiltration Coefficient Base (m/hr)	0.00000	Invert Level (m)	10.131
Membrane Percolation (mm/hr)	1000	Width (m)	5.0
Max Percolation (l/s)	6.9	Length (m)	5.0
Safety Factor	2.0	Slope (1:X)	0.0
Porosity	0.30	Depression Storage (mm)	5

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Porous Car Park Manhole: S2602, DS/PN: S26.002

Evaporation (mm/day) 3 Membrane Depth (mm) 130

Complex Manhole: S2701, DS/PN: S27.001

Porous Car Park

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	10.0
Membrane Percolation (mm/hr)	1000	Length (m)	28.9
Max Percolation (l/s)	80.3	Slope (1:X)	0.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	10.920	Membrane Depth (mm)	130

Infiltration Trench

Infiltration Coefficient Base (m/hr)	0.00000	Trench Width (m)	0.6
Infiltration Coefficient Side (m/hr)	0.00000	Trench Length (m)	28.9
Safety Factor	2.0	Slope (1:X)	300.0
Porosity	0.30	Cap Volume Depth (m)	0.716
Invert Level (m)	9.804	Cap Infiltration Depth (m)	0.000

Porous Car Park Manhole: S2800, DS/PN: S28.000

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	6.1
Membrane Percolation (mm/hr)	1000	Length (m)	10.0
Max Percolation (l/s)	16.9	Slope (1:X)	0.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	10.770	Membrane Depth (mm)	130

Porous Car Park Manhole: S2900, DS/PN: S29.000

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	6.7
Membrane Percolation (mm/hr)	1000	Length (m)	11.0
Max Percolation (l/s)	20.5	Slope (1:X)	0.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	10.570	Membrane Depth (mm)	130

Cellular Storage Manhole: S127, DS/PN: S1.027

Invert Level (m)	7.807	Safety Factor	2.0
Infiltration Coefficient Base (m/hr)	0.00000	Porosity	0.93
Infiltration Coefficient Side (m/hr)	0.00000		

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	450.0	0.0	2.200	450.0	0.0	2.201	0.0	0.0

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Volume Summary (Static)

Length Calculations based on True Length

Pipe Number	USMH Name	Manhole Volume (m³)	Pipe Volume (m³)	Storage Structure Volume (m³)	Total Volume (m³)
S1.000	S100	1.301	0.096	10.376	11.772
S1.001	S101	1.612	0.277	0.000	1.889
S2.000	S200	1.527	0.096	5.108	6.731
S1.002	S102	1.732	1.831	0.000	3.562
S1.003	S103	4.245	0.735	0.000	4.979
S1.004	S104	4.591	2.928	0.000	7.518
S3.000	S300	1.527	0.254	0.000	1.781
S3.001	S301	1.644	0.101	26.220	27.966
S1.005	S105	4.715	1.575	0.000	6.290
S4.000	S400	1.527	0.078	9.387	10.992
S1.006	S106	4.787	3.262	0.000	8.049
S5.000	S500	1.696	3.607	0.000	5.303
S6.000	S600	1.696	2.097	0.000	3.794
S5.001	S501	1.893	4.500	82.006	88.399
S5.002	S502	2.293	0.476	46.847	49.615
S1.007	S107	5.260	5.368	0.000	10.628
S7.000	S700	1.527	0.432	0.000	1.959
S8.000	S800	1.696	0.243	0.000	1.939
S7.001	S701	1.836	0.110	46.138	48.085
S1.008	S108	5.456	2.349	0.000	7.805
S1.009	S109	5.560	1.762	0.000	7.322
S9.000	S900	1.696	0.758	0.000	2.454
S9.001	S901	1.741	0.260	51.722	53.723
S1.010	S110	5.642	4.370	0.000	10.012
S10.000	S1000	1.531	0.100	4.636	6.268
S1.011	S111	5.787	1.078	0.000	6.865
S11.000	S1100	1.527	0.118	5.460	7.105
S1.012	S112	5.852	2.434	0.000	8.286
S12.000	S1200	1.696	0.231	0.000	1.927
S12.001	S1201	1.713	0.373	23.008	25.094
S1.013	S113	6.047	2.238	0.000	8.285
S13.000	S1300	1.696	1.196	0.000	2.892
S13.001	S1301	1.765	0.415	25.040	27.220
S1.014	S114	6.047	0.938	0.000	6.985
S1.015	S115	5.982	1.787	0.000	7.769
S14.000	S1400	1.527	0.109	4.226	5.862
S14.001	S1401	1.527	0.058	0.000	1.586
S1.016	S116	6.128	4.499	0.000	10.628
S1.017	S117	6.113	1.806	0.000	7.920
S15.000	S1500	1.527	0.098	4.570	6.195
S1.018	S118	6.280	2.633	0.000	8.912
S16.000	S1600	1.527	0.098	8.136	9.761
S1.019	S119	6.577	3.896	0.000	10.473
S17.000	S1700	1.696	1.848	32.105	35.649
S18.000	S1800	1.527	0.100	9.075	10.702
S17.001	S1701	1.945	0.945	14.579	17.470
S19.000	S1900	1.527	0.101	13.490	15.118
S17.002	S1702	2.080	1.553	23.485	27.117
S17.003	S1703	2.318	0.848	48.575	51.741
S20.000	S2000	1.696	2.130	0.000	3.827
S20.001	S2001	1.748	0.916	140.197	142.861
S17.004	S1704	2.498	2.331	18.563	23.392
S17.005	S1705	2.477	3.134	30.993	36.605
S17.006	S1706	2.355	0.508	57.759	60.622
S1.020	S120	6.992	3.933	0.000	10.925
S21.000	S2100	1.696	3.020	0.000	4.717
S22.000	S2200	1.696	1.582	0.000	3.278
S21.001	S2101	1.862	3.377	142.941	148.180
S23.000	S2300	1.527	0.081	25.463	27.071

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Volume Summary (Static)

Pipe Number	USMH Name	Manhole Volume (m³)	Pipe Volume (m³)	Storage Structure Volume (m³)	Total Volume (m³)
S21.002	S2102	2.046	1.034	45.679	48.759
S24.000	S2400	1.696	0.437	4.158	6.291
S1.021	S121	7.308	2.068	0.000	9.376
S25.000	S2500	1.527	0.092	4.158	5.777
S1.022	S122	7.279	6.972	0.000	14.252
S1.023	S123	6.908	5.225	0.000	12.133
S26.000	S2600	4.580	1.793	17.382	23.755
S26.001	S2601	5.117	3.630	0.000	8.748
S26.002	S2602	5.272	3.954	2.625	11.850
S26.003	S2603	4.993	2.305	0.000	7.298
S1.024	S124	6.618	3.841	0.000	10.459
S1.025	S125	7.995	1.625	0.000	9.619
S27.000	S2700	1.696	1.960	0.000	3.657
S27.001	S2701	1.805	0.554	34.070	36.428
S28.000	S2800	1.696	0.921	6.405	9.022
S27.002	S2702	1.790	1.281	0.000	3.071
S29.000	S2900	1.527	0.070	7.738	9.335
S27.003	S2703	1.678	0.537	0.000	2.215
S27.004	S2704	0.000	0.933	0.000	0.933
S1.026	S126	0.000	3.193	0.000	3.193
S1.027	S127	0.000	0.081	920.840	920.921
S1.028	S128	3.728	0.165	0.000	3.893
Total		248.955	130.749	1953.161	2332.864

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2 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Surface Water Drainage.SWS

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 12 Number of Storage Structures 36 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FEH Data Type Catchment
FEH Rainfall Version 2013 Cv (Summer) 0.750
Site Location GB 473800 105650 SU 73800 05650 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 150.0
Analysis Timestep 2.5 Second Increment (Extended)
DTS Status OFF
DVD Status ON
Inertia Status ON

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years) 2, 30, 100
Climate Change (%) 0, 20, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)
S1.000	S100	15 Winter	2	+0%	100/15 Winter				9.710	-0.105	0.000
S1.001	S101	15 Winter	2	+0%	100/15 Summer				9.339	-0.142	0.000
S2.000	S200	15 Winter	2	+0%	100/15 Summer				9.534	-0.116	0.000
S1.002	S102	15 Winter	2	+0%	30/360 Winter				9.247	-0.198	0.000
S1.003	S103	15 Winter	2	+0%	30/15 Winter				9.089	-0.265	0.000
S1.004	S104	15 Winter	2	+0%	30/30 Winter				9.013	-0.315	0.000
S3.000	S300	15 Winter	2	+0%	30/15 Summer				9.553	-0.047	0.000
S3.001	S301	15 Winter	2	+0%	2/15 Summer				9.520	0.024	0.000
S1.005	S105	15 Winter	2	+0%	30/15 Winter				8.981	-0.296	0.000
S4.000	S400	15 Winter	2	+0%	100/15 Summer				9.529	-0.109	0.000
S1.006	S106	15 Winter	2	+0%	30/15 Winter				8.945	-0.303	0.000
S5.000	S500	15 Winter	2	+0%	30/15 Winter				9.296	-0.204	0.000
S6.000	S600	15 Winter	2	+0%	100/15 Summer				9.272	-0.228	0.000
S5.001	S501	15 Winter	2	+0%	30/15 Summer				9.178	-0.148	0.000
S5.002	S502	15 Winter	2	+0%	30/15 Summer				8.976	-0.134	0.000
S1.007	S107	15 Winter	2	+0%	30/15 Summer				8.868	-0.215	0.000
S7.000	S700	15 Winter	2	+0%	30/15 Summer				9.521	-0.088	0.000
S8.000	S800	30 Winter	2	+0%	30/15 Summer				9.387	-0.047	0.000
S7.001	S701	30 Winter	2	+0%	2/15 Summer				9.382	0.047	0.000
S1.008	S108	15 Winter	2	+0%	30/15 Summer				8.821	-0.173	0.000
S1.009	S109	15 Winter	2	+0%	30/15 Summer				8.787	-0.166	0.000
S9.000	S900	15 Winter	2	+0%	2/15 Winter				9.566	0.016	0.000
S9.001	S901	15 Winter	2	+0%	2/15 Summer				9.557	0.046	0.000
S1.010	S110	30 Winter	2	+0%	30/15 Summer				8.758	-0.163	0.000
S10.000	S1000	15 Winter	2	+0%	30/15 Summer				9.538	-0.052	0.000
S1.011	S111	240 Winter	2	+0%	30/15 Summer				8.728	-0.120	0.000
S11.000	S1100	15 Winter	2	+0%	100/15 Winter				9.477	-0.124	0.000
S1.012	S112	240 Winter	2	+0%	30/15 Summer				8.725	-0.101	0.000
S12.000	S1200	15 Winter	2	+0%	30/15 Summer				9.513	-0.137	0.000
S12.001	S1201	15 Winter	2	+0%	30/15 Summer				9.511	-0.124	0.000

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2 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Surface Water Drainage.SWS

PN	US/MH Name	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	S100	0.20		4.2	OK	
S1.001	S101	0.29		8.0	OK	
S2.000	S200	0.12		2.9	OK	
S1.002	S102	0.25		14.3	OK	
S1.003	S103	0.19		14.2	OK	
S1.004	S104	0.14		18.0	OK	
S3.000	S300	0.57		7.6	OK	
S3.001	S301	0.59		7.3	SURCHARGED	
S1.005	S105	0.25		24.9	OK	
S4.000	S400	0.17		4.0	OK	
S1.006	S106	0.23		30.6	OK	
S5.000	S500	0.21		12.6	OK	
S6.000	S600	0.13		7.5	OK	
S5.001	S501	0.47		28.6	OK	
S5.002	S502	0.60		28.1	OK	
S1.007	S107	0.40		56.9	OK	
S7.000	S700	0.35		4.8	OK	
S8.000	S800	0.12		1.6	OK	
S7.001	S701	0.64		8.0	SURCHARGED	
S1.008	S108	0.57		64.1	OK	
S1.009	S109	0.61		63.2	OK	
S9.000	S900	0.25		12.6	SURCHARGED	
S9.001	S901	0.23		11.2	SURCHARGED	
S1.010	S110	0.51		69.6	OK	
S10.000	S1000	0.74		14.5	OK	
S1.011	S111	0.32		30.1	OK	
S11.000	S1100	0.07		1.3	OK	
S1.012	S112	0.26		30.4	OK	
S12.000	S1200	0.16		7.5	OK	
S12.001	S1201	0.16		7.3	OK	

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2 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Surface Water Drainage.SWS

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)
S1.013	S113	240 Winter	2	+0%	30/15 Summer				8.717	-0.067	0.000
S13.000	S1300	15 Winter	2	+0%	30/15 Summer				9.422	-0.178	0.000
S13.001	S1301	15 Winter	2	+0%	30/15 Summer				9.413	-0.127	0.000
S1.014	S114	240 Winter	2	+0%	30/15 Summer				8.704	-0.039	0.000
S1.015	S115	240 Winter	2	+0%	30/15 Summer				8.695	-0.029	0.000
S14.000	S1400	15 Winter	2	+0%	100/60 Winter				9.391	-0.125	0.000
S14.001	S1401	15 Winter	2	+0%	30/240 Winter				9.234	-0.117	0.000
S1.016	S116	240 Winter	2	+0%	30/15 Summer				8.677	-0.014	0.000
S1.017	S117	240 Winter	2	+0%	30/15 Summer				8.643	-0.005	0.000
S15.000	S1500	15 Winter	2	+0%	100/60 Winter				9.374	-0.126	0.000
S1.018	S118	240 Winter	2	+0%	30/15 Summer				8.624	-0.003	0.000
S16.000	S1600	360 Winter	2	+0%	100/120 Winter				9.500	-0.150	0.000
S1.019	S119	240 Winter	2	+0%	30/15 Summer				8.597	-0.002	0.000
S17.000	S1700	120 Winter	2	+0%	30/15 Summer				9.636	-0.034	0.000
S18.000	S1800	15 Winter	2	+0%	30/15 Summer				9.666	-0.084	0.000
S17.001	S1701	120 Winter	2	+0%	2/30 Winter				9.634	0.055	0.000
S19.000	S1900	15 Winter	2	+0%	30/15 Summer				9.732	-0.084	0.000
S17.002	S1702	120 Winter	2	+0%	2/30 Winter				9.588	0.057	0.000
S17.003	S1703	120 Winter	2	+0%	2/60 Winter				9.518	0.065	0.000
S20.000	S2000	15 Winter	2	+0%	100/120 Winter				10.074	-0.226	0.000
S20.001	S2001	30 Winter	2	+0%	100/60 Summer				9.945	-0.251	0.000
S17.004	S1704	120 Winter	2	+0%	2/15 Winter				9.450	0.041	0.000
S17.005	S1705	120 Winter	2	+0%	2/30 Winter				9.319	0.024	0.000
S17.006	S1706	180 Winter	2	+0%	30/15 Summer				9.074	-0.069	0.000
S1.020	S120	600 Winter	2	+0%	30/15 Summer				8.560	0.000	0.000
S21.000	S2100	15 Winter	2	+0%	30/360 Winter				9.184	-0.206	0.000
S22.000	S2200	15 Winter	2	+0%	30/360 Winter				9.160	-0.230	0.000
S21.001	S2101	30 Winter	2	+0%	30/180 Winter				9.045	-0.199	0.000
S23.000	S2300	15 Winter	2	+0%	30/15 Summer				9.374	-0.061	0.000
S21.002	S2102	30 Winter	2	+0%	30/120 Summer				8.869	-0.212	0.000
S24.000	S2400	15 Winter	2	+0%	100/180 Winter				9.579	-0.197	0.000
S1.021	S121	120 Winter	2	+0%	30/15 Summer				8.521	0.000	0.000
S25.000	S2500	15 Winter	2	+0%	100/120 Winter				9.616	-0.125	0.000
S1.022	S122	360 Winter	2	+0%	30/15 Summer				8.498	0.000	0.000
S1.023	S123	360 Winter	2	+0%	2/120 Winter				8.467	0.035	0.000
S26.000	S2600	15 Winter	2	+0%	30/120 Winter				8.734	-0.462	0.000
S26.001	S2601	15 Winter	2	+0%	30/120 Winter				8.731	-0.445	0.000
S26.002	S2602	15 Winter	2	+0%	30/120 Winter				8.697	-0.442	0.000
S26.003	S2603	15 Winter	2	+0%	30/120 Winter				8.658	-0.442	0.000
S1.024	S124	360 Winter	2	+0%	2/180 Winter				8.465	0.084	0.000
S1.025	S125	360 Winter	2	+0%	2/180 Winter				8.463	0.120	0.000
S27.000	S2700	15 Winter	2	+0%	100/15 Summer				9.982	-0.218	0.000
S27.001	S2701	15 Winter	2	+0%	100/15 Summer				9.892	-0.212	0.000
S28.000	S2800	15 Winter	2	+0%	30/15 Summer				9.868	-0.182	0.000
S27.002	S2702	15 Winter	2	+0%	30/15 Summer				9.814	-0.128	0.000
S29.000	S2900	15 Winter	2	+0%	30/15 Summer				9.747	-0.103	0.000
S27.003	S2703	15 Winter	2	+0%	30/15 Summer				9.672	-0.074	0.000
S27.004	S2704	15 Winter	2	+0%					9.606	-0.113	0.000
S1.026	S126	360 Winter	2	+0%	2/120 Winter				8.462	0.135	0.000
S1.027	S127	360 Winter	2	+0%	2/15 Summer				8.461	0.612	0.000
S1.028	S128	15 Winter	2	+0%	2/15 Summer				7.876	0.040	0.000

PN	US/MH Name	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
S1.013	S113	0.30		33.4	OK	
S13.000	S1300	0.15		8.4	OK	

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2 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Surface Water Drainage.SWS

PN	US/MH Name	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
S13.001	S1301	0.08		7.3	OK	
S1.014	S114	0.38		35.4	OK	
S1.015	S115	0.34		35.4	OK	
S14.000	S1400	0.06		1.5	OK	
S14.001	S1401	0.11		1.5	OK	
S1.016	S116	0.16		38.0	OK	
S1.017	S117	0.21		37.6	OK	
S15.000	S1500	0.06		1.6	OK	
S1.018	S118	0.20		37.7	OK	
S16.000	S1600	0.00		0.0	OK	
S1.019	S119	0.18		38.3	OK	
S17.000	S1700	0.04		2.1	OK	
S18.000	S1800	0.40		6.0	OK	
S17.001	S1701	0.07		3.9	SURCHARGED	
S19.000	S1900	0.39		5.8	OK	
S17.002	S1702	0.13		7.2	SURCHARGED	
S17.003	S1703	0.09		4.9	SURCHARGED	
S20.000	S2000	0.14		8.0	OK	
S20.001	S2001	0.06		3.4	OK	
S17.004	S1704	0.13		7.7	SURCHARGED	
S17.005	S1705	0.16		9.4	SURCHARGED	
S17.006	S1706	0.18		8.9	OK	
S1.020	S120	0.11		24.1	OK	
S21.000	S2100	0.21		12.4	OK	
S22.000	S2200	0.12		6.9	OK	
S21.001	S2101	0.24		14.5	OK	
S23.000	S2300	0.64		7.7	OK	
S21.002	S2102	0.19		17.6	OK	
S24.000	S2400	0.26		27.4	OK	
S1.021	S121	0.47		84.9	OK	
S25.000	S2500	0.06		1.6	OK	
S1.022	S122	0.16		43.2	OK	
S1.023	S123	0.16		42.0	SURCHARGED	
S26.000	S2600	0.04		6.5	OK	
S26.001	S2601	0.13		26.4	OK	
S26.002	S2602	0.14		29.4	OK	
S26.003	S2603	0.16		29.2	OK	
S1.024	S124	0.23		48.3	SURCHARGED	
S1.025	S125	0.24		47.2	SURCHARGED	
S27.000	S2700	0.16		9.4	OK	
S27.001	S2701	0.19		9.1	OK	
S28.000	S2800	0.32		25.8	OK	
S27.002	S2702	0.62		34.2	OK	
S29.000	S2900	0.22		4.4	OK	
S27.003	S2703	0.91		42.9	OK	
S27.004	S2704	0.70		43.2	OK*	
S1.026	S126	0.18		54.6	SURCHARGED*	
S1.027	S127	1.13		12.3	SURCHARGED*	
S1.028	S128	1.74		12.4	SURCHARGED	

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Surface Water Drainage.SWS

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 12 Number of Storage Structures 36 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FEH Data Type Catchment
FEH Rainfall Version 2013 Cv (Summer) 0.750
Site Location GB 473800 105650 SU 73800 05650 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 150.0
Analysis Timestep 2.5 Second Increment (Extended)
DTS Status OFF
DVD Status ON
Inertia Status ON

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years) 2, 30, 100
Climate Change (%) 0, 20, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)
S1.000	S100	15 Winter	30	+20%	100/15 Winter				9.741	-0.074	0.000
S1.001	S101	480 Winter	30	+20%	100/15 Summer				9.473	-0.008	0.000
S2.000	S200	15 Winter	30	+20%	100/15 Summer				9.557	-0.093	0.000
S1.002	S102	480 Winter	30	+20%	30/360 Winter				9.473	0.028	0.000
S1.003	S103	480 Winter	30	+20%	30/15 Winter				9.472	0.118	0.000
S1.004	S104	480 Winter	30	+20%	30/30 Winter				9.472	0.144	0.000
S3.000	S300	15 Winter	30	+20%	30/15 Summer				10.193	0.593	0.000
S3.001	S301	15 Winter	30	+20%	2/15 Summer				10.047	0.551	0.000
S1.005	S105	480 Winter	30	+20%	30/15 Winter				9.472	0.195	0.000
S4.000	S400	15 Winter	30	+20%	100/15 Summer				9.557	-0.081	0.000
S1.006	S106	480 Winter	30	+20%	30/15 Winter				9.472	0.224	0.000
S5.000	S500	15 Winter	30	+20%	30/15 Winter				9.503	0.003	0.000
S6.000	S600	480 Winter	30	+20%	100/15 Summer				9.474	-0.026	0.000
S5.001	S501	480 Winter	30	+20%	30/15 Summer				9.474	0.148	0.000
S5.002	S502	480 Winter	30	+20%	30/15 Summer				9.472	0.362	0.000
S1.007	S107	480 Winter	30	+20%	30/15 Summer				9.471	0.388	0.000
S7.000	S700	30 Winter	30	+20%	30/15 Summer				9.986	0.377	0.000
S8.000	S800	30 Winter	30	+20%	30/15 Summer				9.966	0.532	0.000
S7.001	S701	30 Winter	30	+20%	2/15 Summer				9.955	0.621	0.000
S1.008	S108	480 Winter	30	+20%	30/15 Summer				9.470	0.476	0.000
S1.009	S109	480 Winter	30	+20%	30/15 Summer				9.468	0.516	0.000
S9.000	S900	15 Winter	30	+20%	2/15 Winter				10.367	0.817	0.000
S9.001	S901	15 Winter	30	+20%	2/15 Summer				10.285	0.775	0.000
S1.010	S110	480 Winter	30	+20%	30/15 Summer				9.467	0.547	0.000
S10.000	S1000	15 Winter	30	+20%	30/15 Summer				9.887	0.297	0.000
S1.011	S111	480 Winter	30	+20%	30/15 Summer				9.465	0.618	0.000
S11.000	S1100	15 Winter	30	+20%	100/15 Winter				9.493	-0.108	0.000
S1.012	S112	480 Winter	30	+20%	30/15 Summer				9.464	0.638	0.000
S12.000	S1200	15 Winter	30	+20%	30/15 Summer				10.021	0.371	0.000
S12.001	S1201	15 Winter	30	+20%	30/15 Summer				10.015	0.380	0.000

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Surface Water Drainage.SWS

PN	US/MH Name	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	S100	0.51		10.9	OK	
S1.001	S101	0.09		2.6	OK	
S2.000	S200	0.31		7.5	OK	
S1.002	S102	0.08		4.6	SURCHARGED	
S1.003	S103	0.06		4.6	SURCHARGED	
S1.004	S104	0.05		6.1	SURCHARGED	
S3.000	S300	1.21		16.2	SURCHARGED	
S3.001	S301	1.26		15.6	SURCHARGED	
S1.005	S105	0.08		8.4	SURCHARGED	
S4.000	S400	0.43		10.5	OK	
S1.006	S106	0.08		10.7	SURCHARGED	
S5.000	S500	0.52		31.1	SURCHARGED	
S6.000	S600	0.04		2.2	OK	
S5.001	S501	0.18		10.9	SURCHARGED	
S5.002	S502	0.23		10.8	SURCHARGED	
S1.007	S107	0.16		22.8	SURCHARGED	
S7.000	S700	0.54		7.5	SURCHARGED	
S8.000	S800	0.21		2.8	SURCHARGED	
S7.001	S701	1.28		16.0	SURCHARGED	
S1.008	S108	0.25		28.6	SURCHARGED	
S1.009	S109	0.28		28.6	SURCHARGED	
S9.000	S900	0.74		38.2	SURCHARGED	
S9.001	S901	0.43		21.1	SURCHARGED	
S1.010	S110	0.25		34.4	SURCHARGED	
S10.000	S1000	1.87		36.7	SURCHARGED	
S1.011	S111	0.41		38.6	SURCHARGED	
S11.000	S1100	0.17		3.3	OK	
S1.012	S112	0.33		38.9	SURCHARGED	
S12.000	S1200	0.37		17.4	SURCHARGED	
S12.001	S1201	0.36		16.5	SURCHARGED	

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Surface Water Drainage.SWS

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)
S1.013	S113	480 Winter	30	+20%	30/15 Summer				9.463	0.679	0.000
S13.000	S1300	15 Winter	30	+20%	30/15 Summer				9.966	0.366	0.000
S13.001	S1301	15 Winter	30	+20%	30/15 Summer				9.948	0.408	0.000
S1.014	S114	480 Winter	30	+20%	30/15 Summer				9.461	0.717	0.000
S1.015	S115	480 Winter	30	+20%	30/15 Summer				9.460	0.735	0.000
S14.000	S1400	480 Winter	30	+20%	100/60 Winter				9.458	-0.058	0.000
S14.001	S1401	480 Winter	30	+20%	30/240 Winter				9.458	0.107	0.000
S1.016	S116	480 Winter	30	+20%	30/15 Summer				9.458	0.766	0.000
S1.017	S117	480 Winter	30	+20%	30/15 Summer				9.457	0.809	0.000
S15.000	S1500	480 Winter	30	+20%	100/60 Winter				9.456	-0.044	0.000
S1.018	S118	480 Winter	30	+20%	30/15 Summer				9.456	0.829	0.000
S16.000	S1600	360 Winter	30	+20%	100/120 Winter				9.500	-0.150	0.000
S1.019	S119	480 Winter	30	+20%	30/15 Summer				9.455	0.856	0.000
S17.000	S1700	60 Winter	30	+20%	30/15 Summer				10.489	0.819	0.000
S18.000	S1800	60 Winter	30	+20%	30/15 Summer				10.493	0.743	0.000
S17.001	S1701	60 Winter	30	+20%	2/30 Winter				10.486	0.907	0.000
S19.000	S1900	60 Winter	30	+20%	30/15 Summer				10.428	0.612	0.000
S17.002	S1702	60 Winter	30	+20%	2/30 Winter				10.416	0.886	0.000
S17.003	S1703	60 Winter	30	+20%	2/60 Winter				10.215	0.762	0.000
S20.000	S2000	15 Winter	30	+20%	100/120 Winter				10.125	-0.175	0.000
S20.001	S2001	120 Winter	30	+20%	100/60 Summer				10.065	-0.131	0.000
S17.004	S1704	120 Winter	30	+20%	2/15 Winter				10.064	0.655	0.000
S17.005	S1705	30 Winter	30	+20%	2/30 Winter				9.995	0.700	0.000
S17.006	S1706	240 Winter	30	+20%	30/15 Summer				9.579	0.436	0.000
S1.020	S120	480 Winter	30	+20%	30/15 Summer				9.454	0.894	0.000
S21.000	S2100	480 Winter	30	+20%	30/360 Winter				9.455	0.065	0.000
S22.000	S2200	480 Winter	30	+20%	30/360 Winter				9.455	0.065	0.000
S21.001	S2101	480 Winter	30	+20%	30/180 Winter				9.455	0.211	0.000
S23.000	S2300	15 Winter	30	+20%	30/15 Summer				9.502	0.067	0.000
S21.002	S2102	480 Winter	30	+20%	30/120 Summer				9.454	0.373	0.000
S24.000	S2400	15 Winter	30	+20%	100/180 Winter				9.657	-0.119	0.000
S1.021	S121	480 Winter	30	+20%	30/15 Summer				9.453	0.932	0.000
S25.000	S2500	15 Winter	30	+20%	100/120 Winter				9.632	-0.109	0.000
S1.022	S122	480 Winter	30	+20%	30/15 Summer				9.451	0.953	0.000
S1.023	S123	480 Winter	30	+20%	2/120 Winter				9.449	1.017	0.000
S26.000	S2600	480 Winter	30	+20%	30/120 Winter				9.447	0.251	0.000
S26.001	S2601	480 Winter	30	+20%	30/120 Winter				9.447	0.271	0.000
S26.002	S2602	480 Winter	30	+20%	30/120 Winter				9.447	0.308	0.000
S26.003	S2603	480 Winter	30	+20%	30/120 Winter				9.447	0.347	0.000
S1.024	S124	480 Winter	30	+20%	2/180 Winter				9.447	1.066	0.000
S1.025	S125	480 Winter	30	+20%	2/180 Winter				9.445	1.102	0.000
S27.000	S2700	15 Winter	30	+20%	100/15 Summer				10.132	-0.068	0.000
S27.001	S2701	15 Winter	30	+20%	100/15 Summer				10.099	-0.005	0.000
S28.000	S2800	15 Winter	30	+20%	30/15 Summer				10.177	0.127	0.000
S27.002	S2702	15 Winter	30	+20%	30/15 Summer				10.072	0.130	0.000
S29.000	S2900	15 Winter	30	+20%	30/15 Summer				9.983	0.133	0.000
S27.003	S2703	15 Winter	30	+20%	30/15 Summer				9.960	0.214	0.000
S27.004	S2704	15 Winter	30	+20%					9.719	0.000	0.000
S1.026	S126	480 Winter	30	+20%	2/120 Winter				9.444	1.117	0.000
S1.027	S127	480 Winter	30	+20%	2/15 Summer				9.443	1.595	0.000
S1.028	S128	15 Winter	30	+20%	2/15 Summer				7.874	0.039	0.000

PN	US/MH Name	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
S1.013	S113	0.38		42.8	SURCHARGED	
S13.000	S1300	0.32		17.7	SURCHARGED	

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Surface Water Drainage.SWS

PN	US/MH Name	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
S13.001	S1301	0.19		16.8	SURCHARGED	
S1.014	S114	0.48		45.2	SURCHARGED	
S1.015	S115	0.44		45.1	SURCHARGED	
S14.000	S1400	0.02		0.4	OK	
S14.001	S1401	0.03		0.4	SURCHARGED	
S1.016	S116	0.21		48.3	SURCHARGED	
S1.017	S117	0.27		47.4	SURCHARGED	
S15.000	S1500	0.02		0.5	OK	
S1.018	S118	0.25		47.3	SURCHARGED	
S16.000	S1600	0.00		0.0	OK	
S1.019	S119	0.22		47.8	SURCHARGED	
S17.000	S1700	0.11		6.4	SURCHARGED	
S18.000	S1800	0.43		6.4	SURCHARGED	
S17.001	S1701	0.13		6.7	SURCHARGED	
S19.000	S1900	0.41		6.1	SURCHARGED	
S17.002	S1702	0.25		14.2	SURCHARGED	
S17.003	S1703	0.15		8.1	SURCHARGED	
S20.000	S2000	0.35		20.5	OK	
S20.001	S2001	0.13		7.1	OK	
S17.004	S1704	0.18		10.4	SURCHARGED	
S17.005	S1705	0.32		18.9	SURCHARGED	
S17.006	S1706	0.27		13.0	SURCHARGED	
S1.020	S120	0.27		57.4	SURCHARGED	
S21.000	S2100	0.06		3.7	SURCHARGED	
S22.000	S2200	0.04		2.0	SURCHARGED	
S21.001	S2101	0.15		8.9	SURCHARGED	
S23.000	S2300	1.66		19.9	SURCHARGED	
S21.002	S2102	0.12		11.1	SURCHARGED	
S24.000	S2400	0.66		71.2	OK	
S1.021	S121	0.42		75.9	SURCHARGED	
S25.000	S2500	0.17		4.2	OK	
S1.022	S122	0.28		75.8	SURCHARGED	
S1.023	S123	0.29		76.6	SURCHARGED	
S26.000	S2600	0.01		2.0	SURCHARGED	
S26.001	S2601	0.04		9.1	SURCHARGED	
S26.002	S2602	0.05		10.5	SURCHARGED	
S26.003	S2603	0.06		10.4	SURCHARGED	
S1.024	S124	0.42		87.4	SURCHARGED	
S1.025	S125	0.44		86.9	SURCHARGED	
S27.000	S2700	0.40		23.2	OK	
S27.001	S2701	0.63		30.8	OK	
S28.000	S2800	0.77		62.3	SURCHARGED	
S27.002	S2702	1.32		73.1	SURCHARGED	
S29.000	S2900	0.51		10.3	SURCHARGED	
S27.003	S2703	2.01		94.9	SURCHARGED	
S27.004	S2704	1.55		95.2	SURCHARGED*	
S1.026	S126	0.34		100.1	SURCHARGED*	
S1.027	S127	1.13		12.3	SURCHARGED*	
S1.028	S128	1.75		12.4	SURCHARGED	

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Surface Water Drainage.SWS

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 12 Number of Storage Structures 36 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FEH Data Type Catchment
FEH Rainfall Version 2013 Cv (Summer) 0.750
Site Location GB 473800 105650 SU 73800 05650 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 150.0
Analysis Timestep 2.5 Second Increment (Extended)
DTS Status OFF
DVD Status ON
Inertia Status ON

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years) 2, 30, 100
Climate Change (%) 0, 20, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)
S1.000	S100	600 Winter	100	+40%	100/15 Winter				10.234	0.419	0.000
S1.001	S101	600 Winter	100	+40%	100/15 Summer				10.233	0.752	0.000
S2.000	S200	600 Winter	100	+40%	100/15 Summer				10.233	0.583	0.000
S1.002	S102	600 Winter	100	+40%	30/360 Winter				10.233	0.788	0.000
S1.003	S103	600 Winter	100	+40%	30/15 Winter				10.234	0.880	0.000
S1.004	S104	600 Winter	100	+40%	30/30 Winter				10.234	0.906	0.000
S3.000	S300	15 Winter	100	+40%	30/15 Summer				10.768	1.168	0.000
S3.001	S301	15 Winter	100	+40%	2/15 Summer				10.430	0.934	0.000
S1.005	S105	600 Winter	100	+40%	30/15 Winter				10.234	0.957	0.000
S4.000	S400	600 Winter	100	+40%	100/15 Summer				10.235	0.597	0.000
S1.006	S106	600 Winter	100	+40%	30/15 Winter				10.234	0.986	0.000
S5.000	S500	600 Winter	100	+40%	30/15 Winter				10.226	0.726	0.000
S6.000	S600	600 Winter	100	+40%	100/15 Summer				10.226	0.726	0.000
S5.001	S501	600 Winter	100	+40%	30/15 Summer				10.226	0.900	0.000
S5.002	S502	600 Winter	100	+40%	30/15 Summer				10.236	1.126	0.000
S1.007	S107	600 Winter	100	+40%	30/15 Summer				10.234	1.151	0.000
S7.000	S700	15 Winter	100	+40%	30/15 Summer				10.476	0.867	0.000
S8.000	S800	30 Winter	100	+40%	30/15 Summer				10.373	0.939	0.000
S7.001	S701	30 Winter	100	+40%	2/15 Summer				10.362	1.028	0.000
S1.008	S108	600 Winter	100	+40%	30/15 Summer				10.239	1.245	0.000
S1.009	S109	600 Winter	100	+40%	30/15 Summer				10.238	1.285	0.000
S9.000	S900	30 Winter	100	+40%	2/15 Winter				10.398	0.848	0.000
S9.001	S901	30 Winter	100	+40%	2/15 Summer				10.336	0.826	0.000
S1.010	S110	600 Winter	100	+40%	30/15 Summer				10.237	1.316	0.000
S10.000	S1000	15 Winter	100	+40%	30/15 Summer				10.319	0.729	0.000
S1.011	S111	600 Winter	100	+40%	30/15 Summer				10.235	1.387	0.000
S11.000	S1100	600 Winter	100	+40%	100/15 Winter				10.236	0.635	0.000
S1.012	S112	600 Winter	100	+40%	30/15 Summer				10.234	1.408	0.000
S12.000	S1200	15 Winter	100	+40%	30/15 Summer				10.444	0.794	0.000
S12.001	S1201	15 Winter	100	+40%	30/15 Summer				10.382	0.747	0.000

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Surface Water Drainage.SWS

PN	US/MH Name	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	S100	0.07		1.5	SURCHARGED	
S1.001	S101	0.11		3.0	SURCHARGED	
S2.000	S200	0.04		1.0	SURCHARGED	
S1.002	S102	0.09		5.4	SURCHARGED	
S1.003	S103	0.07		5.2	SURCHARGED	
S1.004	S104	0.05		7.0	SURCHARGED	
S3.000	S300	1.80		24.1	FLOOD RISK	
S3.001	S301	1.51		18.7	SURCHARGED	
S1.005	S105	0.10		9.6	SURCHARGED	
S4.000	S400	0.06		1.4	SURCHARGED	
S1.006	S106	0.09		12.3	SURCHARGED	
S5.000	S500	0.08		4.6	SURCHARGED	
S6.000	S600	0.04		2.6	SURCHARGED	
S5.001	S501	0.20		12.3	SURCHARGED	
S5.002	S502	0.26		12.1	SURCHARGED	
S1.007	S107	0.18		25.7	SURCHARGED	
S7.000	S700	0.90		12.4	SURCHARGED	
S8.000	S800	0.38		5.1	SURCHARGED	
S7.001	S701	1.37		17.2	SURCHARGED	
S1.008	S108	0.27		31.0	SURCHARGED	
S1.009	S109	0.30		30.5	SURCHARGED	
S9.000	S900	0.88		45.2	SURCHARGED	
S9.001	S901	0.42		21.0	SURCHARGED	
S1.010	S110	0.26		36.4	SURCHARGED	
S10.000	S1000	2.66		52.1	SURCHARGED	
S1.011	S111	0.43		40.4	SURCHARGED	
S11.000	S1100	0.06		1.2	SURCHARGED	
S1.012	S112	0.34		40.1	SURCHARGED	
S12.000	S1200	0.56		26.5	SURCHARGED	
S12.001	S1201	0.45		20.6	SURCHARGED	

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Surface Water Drainage.SWS

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)
S1.013	S113	600 Winter	100	+40%	30/15 Summer				10.234	1.450	0.000
S13.000	S1300	15 Winter	100	+40%	30/15 Summer				10.402	0.802	0.000
S13.001	S1301	15 Winter	100	+40%	30/15 Summer				10.333	0.793	0.000
S1.014	S114	600 Winter	100	+40%	30/15 Summer				10.233	1.490	0.000
S1.015	S115	600 Winter	100	+40%	30/15 Summer				10.233	1.509	0.000
S14.000	S1400	600 Winter	100	+40%	100/60 Winter				10.228	0.712	0.000
S14.001	S1401	600 Winter	100	+40%	30/240 Winter				10.227	0.876	0.000
S1.016	S116	600 Winter	100	+40%	30/15 Summer				10.232	1.540	0.000
S1.017	S117	600 Winter	100	+40%	30/15 Summer				10.232	1.584	0.000
S15.000	S1500	600 Winter	100	+40%	100/60 Winter				10.231	0.731	0.000
S1.018	S118	600 Winter	100	+40%	30/15 Summer				10.231	1.604	0.000
S16.000	S1600	600 Winter	100	+40%	100/120 Winter				10.233	0.583	0.000
S1.019	S119	600 Winter	100	+40%	30/15 Summer				10.231	1.632	0.000
S17.000	S1700	60 Winter	100	+40%	30/15 Summer				10.626	0.956	0.000
S18.000	S1800	60 Winter	100	+40%	30/15 Summer				10.629	0.879	0.000
S17.001	S1701	60 Winter	100	+40%	2/30 Winter				10.624	1.045	0.000
S19.000	S1900	60 Winter	100	+40%	30/15 Summer				10.602	0.786	0.000
S17.002	S1702	60 Winter	100	+40%	2/30 Winter				10.590	1.059	0.000
S17.003	S1703	120 Winter	100	+40%	2/60 Winter				10.435	0.982	0.000
S20.000	S2000	180 Winter	100	+40%	100/120 Winter				10.338	0.038	0.000
S20.001	S2001	180 Winter	100	+40%	100/60 Summer				10.337	0.141	0.000
S17.004	S1704	180 Winter	100	+40%	2/15 Winter				10.336	0.927	0.000
S17.005	S1705	15 Winter	100	+40%	2/30 Winter				10.475	1.180	0.000
S17.006	S1706	480 Winter	100	+40%	30/15 Summer				10.238	1.095	0.000
S1.020	S120	600 Winter	100	+40%	30/15 Summer				10.231	1.670	0.000
S21.000	S2100	600 Winter	100	+40%	30/360 Winter				10.202	0.812	0.000
S22.000	S2200	600 Winter	100	+40%	30/360 Winter				10.202	0.812	0.000
S21.001	S2101	600 Winter	100	+40%	30/180 Winter				10.202	0.958	0.000
S23.000	S2300	600 Winter	100	+40%	30/15 Summer				10.201	0.766	0.000
S21.002	S2102	600 Winter	100	+40%	30/120 Summer				10.204	1.123	0.000
S24.000	S2400	600 Winter	100	+40%	100/180 Winter				10.235	0.459	0.000
S1.021	S121	600 Winter	100	+40%	30/15 Summer				10.231	1.710	0.000
S25.000	S2500	600 Winter	100	+40%	100/120 Winter				10.238	0.497	0.000
S1.022	S122	600 Winter	100	+40%	30/15 Summer				10.235	1.737	0.000
S1.023	S123	600 Winter	100	+40%	2/120 Winter				10.238	1.806	0.000
S26.000	S2600	600 Winter	100	+40%	30/120 Winter				10.211	1.015	0.000
S26.001	S2601	600 Winter	100	+40%	30/120 Winter				10.214	1.038	0.000
S26.002	S2602	600 Winter	100	+40%	30/120 Winter				10.229	1.089	0.000
S26.003	S2603	600 Winter	100	+40%	30/120 Winter				10.234	1.135	0.000
S1.024	S124	600 Winter	100	+40%	2/180 Winter				10.237	1.856	0.000
S1.025	S125	600 Winter	100	+40%	2/180 Winter				10.236	1.893	0.000
S27.000	S2700	15 Winter	100	+40%	100/15 Summer				10.619	0.419	0.000
S27.001	S2701	15 Winter	100	+40%	100/15 Summer				10.541	0.437	0.000
S28.000	S2800	15 Winter	100	+40%	30/15 Summer				10.615	0.565	0.000
S27.002	S2702	15 Winter	100	+40%	30/15 Summer				10.487	0.545	0.000
S29.000	S2900	15 Winter	100	+40%	30/15 Summer				10.303	0.453	0.000
S27.003	S2703	15 Winter	100	+40%	30/15 Summer				10.255	0.509	0.000
S27.004	S2704	15 Winter	100	+40%					9.719	0.000	0.000
S1.026	S126	960 Winter	100	+40%	2/120 Winter				9.675	1.348	0.000
S1.027	S127	600 Winter	100	+40%	2/15 Summer				10.008	2.160	0.000
S1.028	S128	15 Summer	100	+40%	2/15 Summer				7.878	0.042	0.000

PN	US/MH Name	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
S1.013	S113	0.39		44.1	SURCHARGED	
S13.000	S1300	0.51		28.2	SURCHARGED	

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Surface Water Drainage.SWS

PN	US/MH Name	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
S13.001	S1301	0.23		20.8	SURCHARGED	
S1.014	S114	0.50		46.5	SURCHARGED	
S1.015	S115	0.44		45.9	SURCHARGED	
S14.000	S1400	0.07		1.6	SURCHARGED	
S14.001	S1401	0.19		2.6	SURCHARGED	
S1.016	S116	0.21		49.2	SURCHARGED	
S1.017	S117	0.28		48.8	SURCHARGED	
S15.000	S1500	0.07		1.9	SURCHARGED	
S1.018	S118	0.25		48.8	SURCHARGED	
S16.000	S1600	0.07		1.5	SURCHARGED	
S1.019	S119	0.23		49.7	SURCHARGED	
S17.000	S1700	0.14		7.9	SURCHARGED	
S18.000	S1800	0.51		7.5	SURCHARGED	
S17.001	S1701	0.12		6.3	SURCHARGED	
S19.000	S1900	0.62		9.2	SURCHARGED	
S17.002	S1702	0.29		16.5	SURCHARGED	
S17.003	S1703	0.15		8.1	SURCHARGED	
S20.000	S2000	0.12		7.2	SURCHARGED	
S20.001	S2001	0.12		6.4	SURCHARGED	
S17.004	S1704	0.13		7.9	SURCHARGED	
S17.005	S1705	0.39		23.4	SURCHARGED	
S17.006	S1706	0.25		12.1	SURCHARGED	
S1.020	S120	0.27		59.5	SURCHARGED	
S21.000	S2100	0.07		4.4	SURCHARGED	
S22.000	S2200	0.04		2.4	SURCHARGED	
S21.001	S2101	0.17		10.0	SURCHARGED	
S23.000	S2300	0.24		2.9	SURCHARGED	
S21.002	S2102	0.18		17.0	SURCHARGED	
S24.000	S2400	0.09		9.6	SURCHARGED	
S1.021	S121	0.43		77.9	SURCHARGED	
S25.000	S2500	0.11		2.8	SURCHARGED	
S1.022	S122	0.29		77.9	SURCHARGED	
S1.023	S123	0.30		78.6	SURCHARGED	
S26.000	S2600	0.18		30.3	SURCHARGED	
S26.001	S2601	0.14		28.7	SURCHARGED	
S26.002	S2602	0.10		20.6	SURCHARGED	
S26.003	S2603	0.09		16.9	SURCHARGED	
S1.024	S124	0.41		85.3	FLOOD RISK	
S1.025	S125	0.43		84.8	SURCHARGED	
S27.000	S2700	0.52		29.8	SURCHARGED	
S27.001	S2701	0.76		37.2	SURCHARGED	
S28.000	S2800	1.09		87.5	SURCHARGED	
S27.002	S2702	1.90		105.0	SURCHARGED	
S29.000	S2900	0.68		13.7	SURCHARGED	
S27.003	S2703	2.85		134.9	SURCHARGED	
S27.004	S2704	2.19		134.7	SURCHARGED*	
S1.026	S126	0.24		71.9	SURCHARGED*	
S1.027	S127	1.13		12.3	SURCHARGED*	
S1.028	S128	1.79		12.7	SURCHARGED	

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Summary of Results for 100 year Return Period (+40%)

Half Drain Time : 325 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	0.155	0.155	0.3	4.7	O K
30 min Summer	0.207	0.207	0.3	6.2	Flood Risk
60 min Summer	0.257	0.257	0.3	7.7	Flood Risk
120 min Summer	0.282	0.282	0.3	8.5	Flood Risk
180 min Summer	0.290	0.290	0.3	8.7	Flood Risk
240 min Summer	0.291	0.291	0.3	8.7	Flood Risk
360 min Summer	0.284	0.284	0.3	8.5	Flood Risk
480 min Summer	0.275	0.275	0.3	8.2	Flood Risk
600 min Summer	0.265	0.265	0.3	8.0	Flood Risk
720 min Summer	0.255	0.255	0.3	7.6	Flood Risk
960 min Summer	0.234	0.234	0.3	7.0	Flood Risk
1440 min Summer	0.195	0.195	0.3	5.9	O K
2160 min Summer	0.147	0.147	0.3	4.4	O K
2880 min Summer	0.110	0.110	0.3	3.3	O K
4320 min Summer	0.065	0.065	0.3	1.9	O K
5760 min Summer	0.048	0.048	0.3	1.4	O K
7200 min Summer	0.042	0.042	0.2	1.3	O K
8640 min Summer	0.038	0.038	0.2	1.2	O K
10080 min Summer	0.035	0.035	0.2	1.1	O K
15 min Winter	0.176	0.176	0.3	5.3	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	137.200	0.0	18
30 min Summer	91.280	0.0	33
60 min Summer	58.100	0.0	62
120 min Summer	33.950	0.0	122
180 min Summer	24.762	0.0	180
240 min Summer	19.775	0.0	240
360 min Summer	14.373	0.0	296
480 min Summer	11.428	0.0	358
600 min Summer	9.554	0.0	422
720 min Summer	8.248	0.0	490
960 min Summer	6.538	0.0	626
1440 min Summer	4.702	0.0	894
2160 min Summer	3.393	0.0	1272
2880 min Summer	2.707	0.0	1616
4320 min Summer	1.993	0.0	2292
5760 min Summer	1.625	0.0	2944
7200 min Summer	1.405	0.0	3672
8640 min Summer	1.258	0.0	4408
10080 min Summer	1.155	0.0	5144
15 min Winter	137.200	0.0	18

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Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	0.234	0.234	0.3	7.0	Flood Risk
60 min Winter	0.291	0.291	0.3	8.7	Flood Risk
120 min Winter	0.322	0.322	0.3	9.7	Flood Risk
180 min Winter	0.334	0.334	0.3	10.0	Flood Risk
240 min Winter	0.337	0.337	0.3	10.1	Flood Risk
360 min Winter	0.330	0.330	0.3	9.9	Flood Risk
480 min Winter	0.317	0.317	0.3	9.5	Flood Risk
600 min Winter	0.304	0.304	0.3	9.1	Flood Risk
720 min Winter	0.290	0.290	0.3	8.7	Flood Risk
960 min Winter	0.260	0.260	0.3	7.8	Flood Risk
1440 min Winter	0.201	0.201	0.3	6.0	Flood Risk
2160 min Winter	0.128	0.128	0.3	3.8	O K
2880 min Winter	0.077	0.077	0.3	2.3	O K
4320 min Winter	0.044	0.044	0.2	1.3	O K
5760 min Winter	0.036	0.036	0.2	1.1	O K
7200 min Winter	0.031	0.031	0.2	0.9	O K
8640 min Winter	0.028	0.028	0.1	0.8	O K
10080 min Winter	0.026	0.026	0.1	0.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
30 min Winter	91.280	0.0	33
60 min Winter	58.100	0.0	62
120 min Winter	33.950	0.0	120
180 min Winter	24.762	0.0	176
240 min Winter	19.775	0.0	232
360 min Winter	14.373	0.0	338
480 min Winter	11.428	0.0	384
600 min Winter	9.554	0.0	458
720 min Winter	8.248	0.0	534
960 min Winter	6.538	0.0	684
1440 min Winter	4.702	0.0	964
2160 min Winter	3.393	0.0	1340
2880 min Winter	2.707	0.0	1668
4320 min Winter	1.993	0.0	2244
5760 min Winter	1.625	0.0	2944
7200 min Winter	1.405	0.0	3680
8640 min Winter	1.258	0.0	4408
10080 min Winter	1.155	0.0	5144

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Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 473800 105650 SU 73800 05650
Data Type	Catchment
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Shortest Storm (mins)	15
Longest Storm (mins)	10080
Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.020

Time (mins) From:	To:	Area (ha)
0	4	0.020

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Model Details

Storage is Online Cover Level (m) 0.500

Porous Car Park Structure

Infiltration Coefficient Base (m/hr)	0.01872	Width (m)	20.0
Membrane Percolation (mm/hr)	1000	Length (m)	5.0
Max Percolation (l/s)	27.8	Slope (1:X)	0.0
Safety Factor	2.0	Depression Storage (mm)	3
Porosity	0.30	Evaporation (mm/day)	1
Invert Level (m)	0.000	Membrane Depth (m)	130

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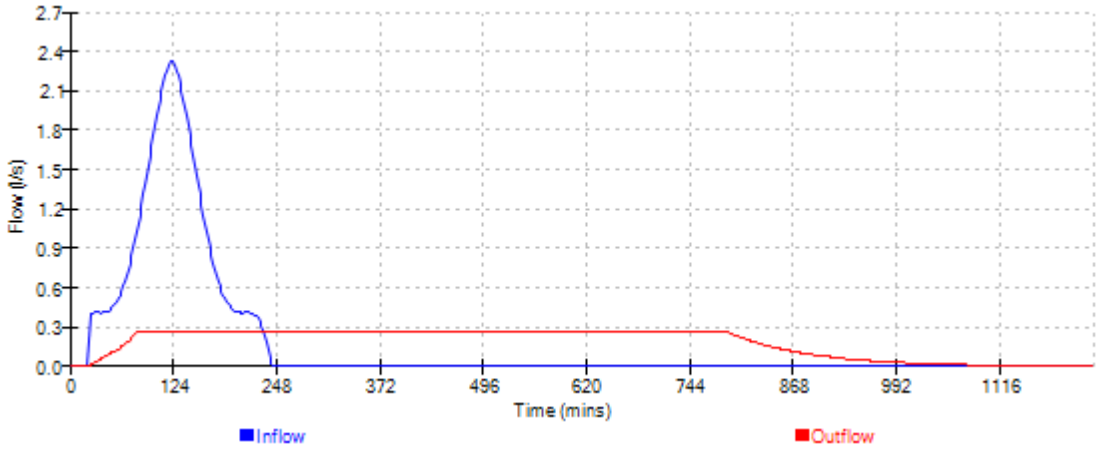
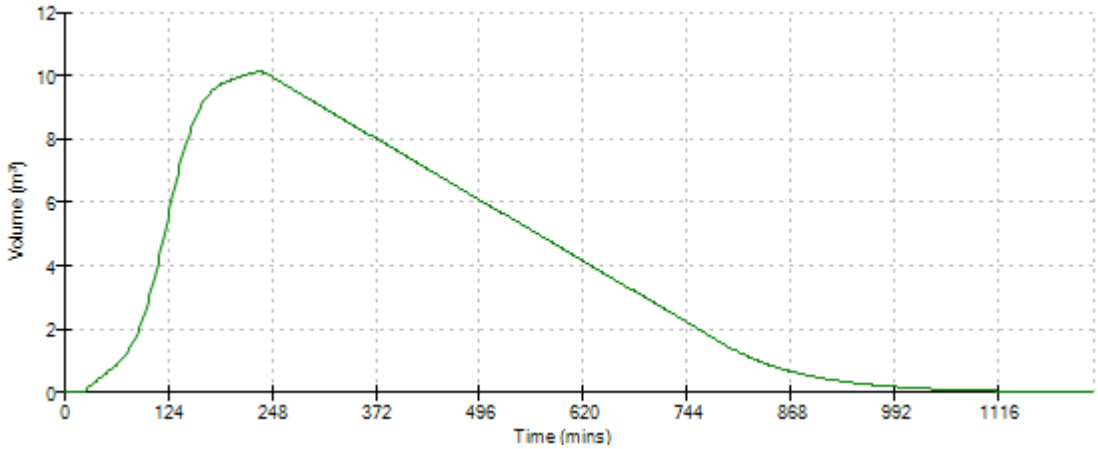
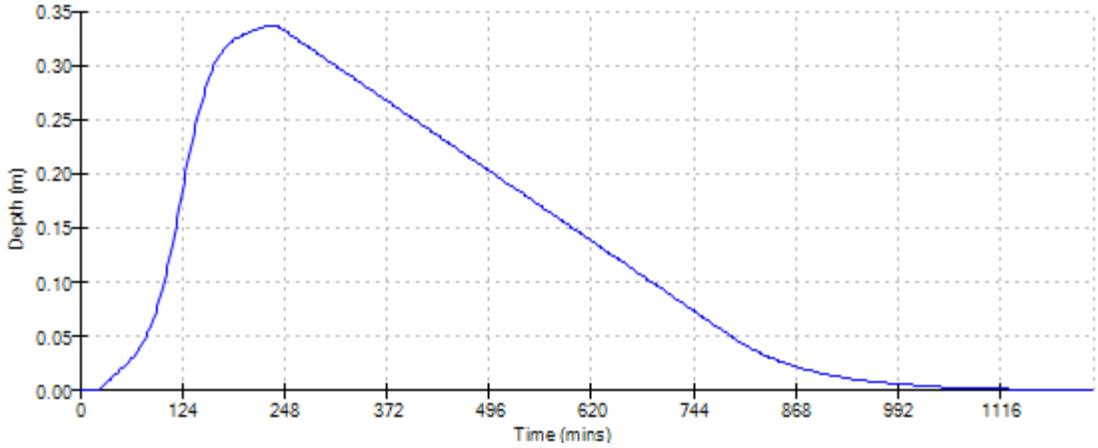
Event: 240 min Winter







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Summary of Results for 100 year Return Period (+40%)

Half Drain Time : 338 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	0.160	0.160	0.4	8.2	O K
30 min Summer	0.213	0.213	0.4	10.9	Flood Risk
60 min Summer	0.265	0.265	0.4	13.5	Flood Risk
120 min Summer	0.292	0.292	0.4	14.9	Flood Risk
180 min Summer	0.301	0.301	0.4	15.3	Flood Risk
240 min Summer	0.301	0.301	0.4	15.4	Flood Risk
360 min Summer	0.295	0.295	0.4	15.0	Flood Risk
480 min Summer	0.285	0.285	0.4	14.6	Flood Risk
600 min Summer	0.276	0.276	0.4	14.1	Flood Risk
720 min Summer	0.265	0.265	0.4	13.5	Flood Risk
960 min Summer	0.244	0.244	0.4	12.5	Flood Risk
1440 min Summer	0.205	0.205	0.4	10.5	Flood Risk
2160 min Summer	0.155	0.155	0.4	7.9	O K
2880 min Summer	0.117	0.117	0.4	6.0	O K
4320 min Summer	0.069	0.069	0.4	3.5	O K
5760 min Summer	0.049	0.049	0.4	2.5	O K
7200 min Summer	0.044	0.044	0.4	2.2	O K
8640 min Summer	0.039	0.039	0.3	2.0	O K
10080 min Summer	0.036	0.036	0.3	1.9	O K
15 min Winter	0.181	0.181	0.4	9.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	137.200	0.0	18
30 min Summer	91.280	0.0	33
60 min Summer	58.100	0.0	62
120 min Summer	33.950	0.0	122
180 min Summer	24.762	0.0	180
240 min Summer	19.775	0.0	240
360 min Summer	14.373	0.0	302
480 min Summer	11.428	0.0	362
600 min Summer	9.554	0.0	426
720 min Summer	8.248	0.0	492
960 min Summer	6.538	0.0	626
1440 min Summer	4.702	0.0	894
2160 min Summer	3.393	0.0	1276
2880 min Summer	2.707	0.0	1640
4320 min Summer	1.993	0.0	2292
5760 min Summer	1.625	0.0	2944
7200 min Summer	1.405	0.0	3672
8640 min Summer	1.258	0.0	4408
10080 min Summer	1.155	0.0	5144
15 min Winter	137.200	0.0	18

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Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	0.241	0.241	0.4	12.3	Flood Risk
60 min Winter	0.301	0.301	0.4	15.3	Flood Risk
120 min Winter	0.333	0.333	0.4	17.0	Flood Risk
180 min Winter	0.346	0.346	0.4	17.6	Flood Risk
240 min Winter	0.349	0.349	0.4	17.8	Flood Risk
360 min Winter	0.343	0.343	0.4	17.5	Flood Risk
480 min Winter	0.330	0.330	0.4	16.8	Flood Risk
600 min Winter	0.317	0.317	0.4	16.2	Flood Risk
720 min Winter	0.302	0.302	0.4	15.4	Flood Risk
960 min Winter	0.272	0.272	0.4	13.9	Flood Risk
1440 min Winter	0.213	0.213	0.4	10.9	Flood Risk
2160 min Winter	0.138	0.138	0.4	7.1	O K
2880 min Winter	0.084	0.084	0.4	4.3	O K
4320 min Winter	0.045	0.045	0.4	2.3	O K
5760 min Winter	0.037	0.037	0.3	1.9	O K
7200 min Winter	0.032	0.032	0.3	1.6	O K
8640 min Winter	0.029	0.029	0.3	1.5	O K
10080 min Winter	0.027	0.027	0.2	1.4	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
30 min Winter	91.280	0.0	33
60 min Winter	58.100	0.0	62
120 min Winter	33.950	0.0	120
180 min Winter	24.762	0.0	178
240 min Winter	19.775	0.0	234
360 min Winter	14.373	0.0	340
480 min Winter	11.428	0.0	386
600 min Winter	9.554	0.0	460
720 min Winter	8.248	0.0	536
960 min Winter	6.538	0.0	684
1440 min Winter	4.702	0.0	966
2160 min Winter	3.393	0.0	1344
2880 min Winter	2.707	0.0	1672
4320 min Winter	1.993	0.0	2248
5760 min Winter	1.625	0.0	2944
7200 min Winter	1.405	0.0	3680
8640 min Winter	1.258	0.0	4408
10080 min Winter	1.155	0.0	5040

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Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 473800 105650 SU 73800 05650
Data Type	Catchment
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Shortest Storm (mins)	15
Longest Storm (mins)	10080
Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.035

Time (mins) From:	To:	Area (ha)
0	4	0.035

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Model Details

Storage is Online Cover Level (m) 0.500

Porous Car Park Structure

Infiltration Coefficient Base (m/hr)	0.01872	Width (m)	27.0
Membrane Percolation (mm/hr)	1000	Length (m)	6.3
Max Percolation (l/s)	47.3	Slope (1:X)	0.0
Safety Factor	2.0	Depression Storage (mm)	3
Porosity	0.30	Evaporation (mm/day)	1
Invert Level (m)	0.000	Membrane Depth (m)	130

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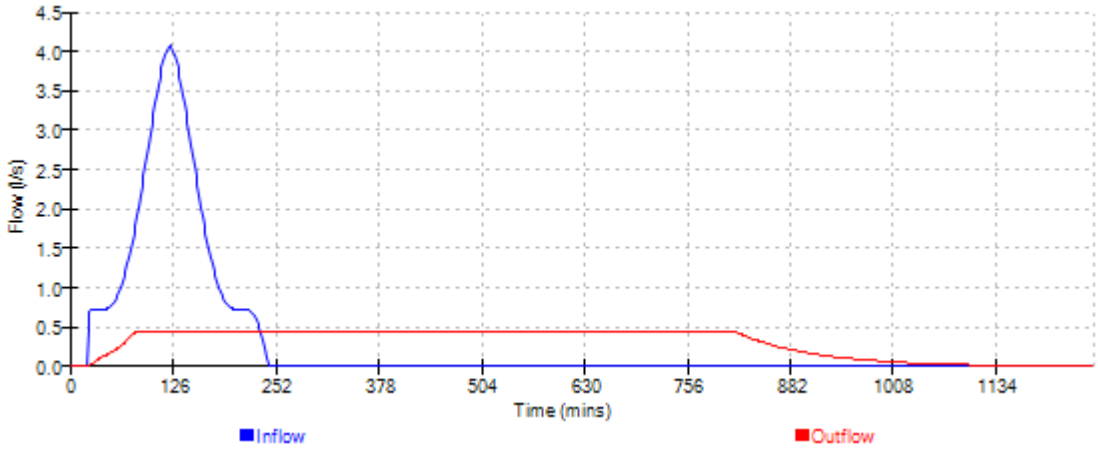
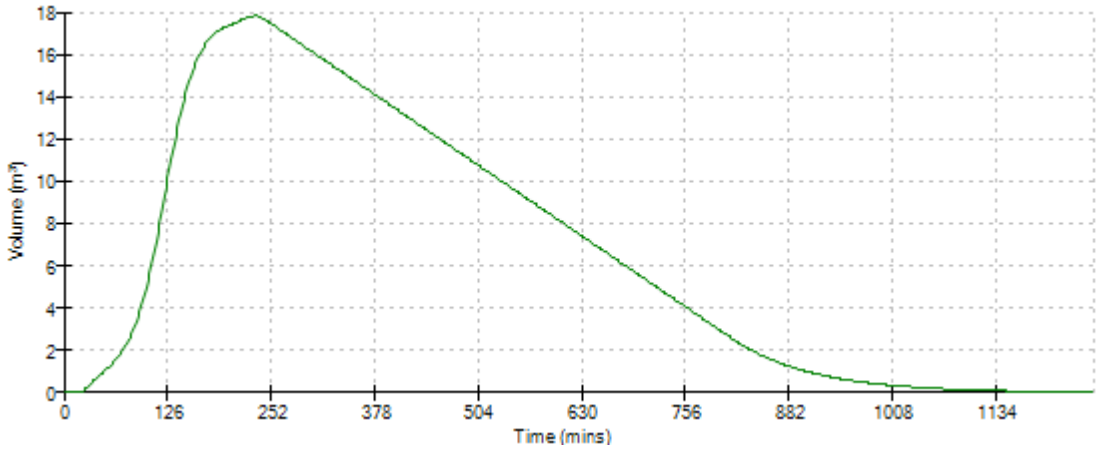
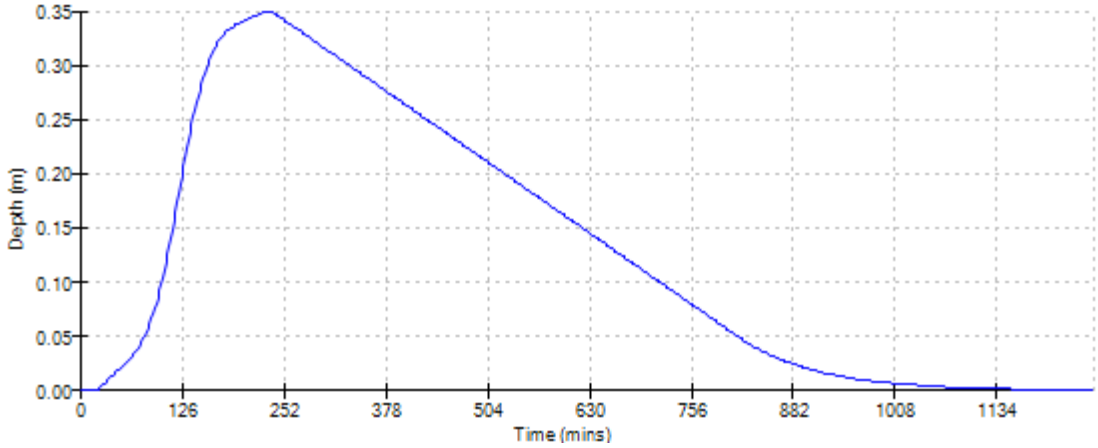
Event: 240 min Winter







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Summary of Results for 100 year Return Period (+40%)

Half Drain Time : 353 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	0.166	0.166	0.6	10.5	O K
30 min Summer	0.221	0.221	0.6	14.0	Flood Risk
60 min Summer	0.275	0.275	0.6	17.5	Flood Risk
120 min Summer	0.303	0.303	0.6	19.2	Flood Risk
180 min Summer	0.313	0.313	0.6	19.9	Flood Risk
240 min Summer	0.314	0.314	0.6	19.9	Flood Risk
360 min Summer	0.307	0.307	0.6	19.5	Flood Risk
480 min Summer	0.298	0.298	0.6	18.9	Flood Risk
600 min Summer	0.288	0.288	0.6	18.3	Flood Risk
720 min Summer	0.278	0.278	0.6	17.6	Flood Risk
960 min Summer	0.257	0.257	0.6	16.3	Flood Risk
1440 min Summer	0.217	0.217	0.6	13.8	Flood Risk
2160 min Summer	0.166	0.166	0.6	10.5	O K
2880 min Summer	0.127	0.127	0.6	8.0	O K
4320 min Summer	0.075	0.075	0.6	4.8	O K
5760 min Summer	0.051	0.051	0.6	3.3	O K
7200 min Summer	0.045	0.045	0.5	2.9	O K
8640 min Summer	0.041	0.041	0.4	2.6	O K
10080 min Summer	0.038	0.038	0.4	2.4	O K
15 min Winter	0.188	0.188	0.6	11.9	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	137.200	0.0	18
30 min Summer	91.280	0.0	33
60 min Summer	58.100	0.0	62
120 min Summer	33.950	0.0	122
180 min Summer	24.762	0.0	182
240 min Summer	19.775	0.0	240
360 min Summer	14.373	0.0	306
480 min Summer	11.428	0.0	366
600 min Summer	9.554	0.0	430
720 min Summer	8.248	0.0	496
960 min Summer	6.538	0.0	634
1440 min Summer	4.702	0.0	896
2160 min Summer	3.393	0.0	1280
2880 min Summer	2.707	0.0	1644
4320 min Summer	1.993	0.0	2332
5760 min Summer	1.625	0.0	2944
7200 min Summer	1.405	0.0	3672
8640 min Summer	1.258	0.0	4408
10080 min Summer	1.155	0.0	5136
15 min Winter	137.200	0.0	18

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Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	0.249	0.249	0.6	15.8	Flood Risk
60 min Winter	0.312	0.312	0.6	19.8	Flood Risk
120 min Winter	0.346	0.346	0.6	22.0	Flood Risk
180 min Winter	0.359	0.359	0.6	22.8	Flood Risk
240 min Winter	0.364	0.364	0.6	23.1	Flood Risk
360 min Winter	0.358	0.358	0.6	22.8	Flood Risk
480 min Winter	0.345	0.345	0.6	21.9	Flood Risk
600 min Winter	0.332	0.332	0.6	21.1	Flood Risk
720 min Winter	0.317	0.317	0.6	20.2	Flood Risk
960 min Winter	0.287	0.287	0.6	18.2	Flood Risk
1440 min Winter	0.227	0.227	0.6	14.4	Flood Risk
2160 min Winter	0.151	0.151	0.6	9.6	O K
2880 min Winter	0.094	0.094	0.6	6.0	O K
4320 min Winter	0.047	0.047	0.5	3.0	O K
5760 min Winter	0.039	0.039	0.4	2.4	O K
7200 min Winter	0.033	0.033	0.4	2.1	O K
8640 min Winter	0.030	0.030	0.3	1.9	O K
10080 min Winter	0.028	0.028	0.3	1.7	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
30 min Winter	91.280	0.0	33
60 min Winter	58.100	0.0	62
120 min Winter	33.950	0.0	120
180 min Winter	24.762	0.0	178
240 min Winter	19.775	0.0	234
360 min Winter	14.373	0.0	342
480 min Winter	11.428	0.0	392
600 min Winter	9.554	0.0	464
720 min Winter	8.248	0.0	540
960 min Winter	6.538	0.0	692
1440 min Winter	4.702	0.0	970
2160 min Winter	3.393	0.0	1360
2880 min Winter	2.707	0.0	1700
4320 min Winter	1.993	0.0	2248
5760 min Winter	1.625	0.0	2984
7200 min Winter	1.405	0.0	3680
8640 min Winter	1.258	0.0	4408
10080 min Winter	1.155	0.0	5080

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Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 473800 105650 SU 73800 05650
Data Type	Catchment
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Shortest Storm (mins)	15
Longest Storm (mins)	10080
Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.045

Time (mins) From:	To:	Area (ha)
0	4	0.045

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Model Details

Storage is Online Cover Level (m) 0.500

Porous Car Park Structure

Infiltration Coefficient Base (m/hr)	0.01872	Width (m)	18.9
Membrane Percolation (mm/hr)	1000	Length (m)	11.2
Max Percolation (l/s)	58.8	Slope (1:X)	0.0
Safety Factor	2.0	Depression Storage (mm)	3
Porosity	0.30	Evaporation (mm/day)	1
Invert Level (m)	0.000	Membrane Depth (m)	130

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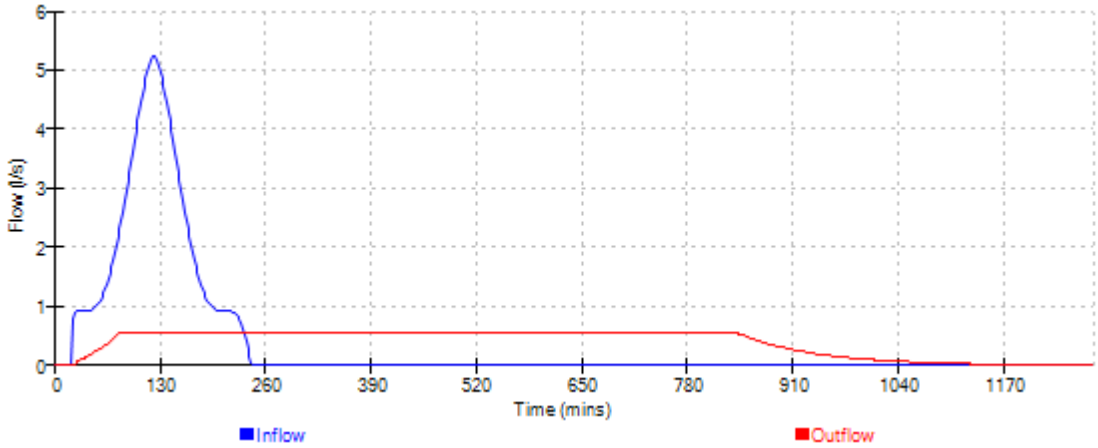
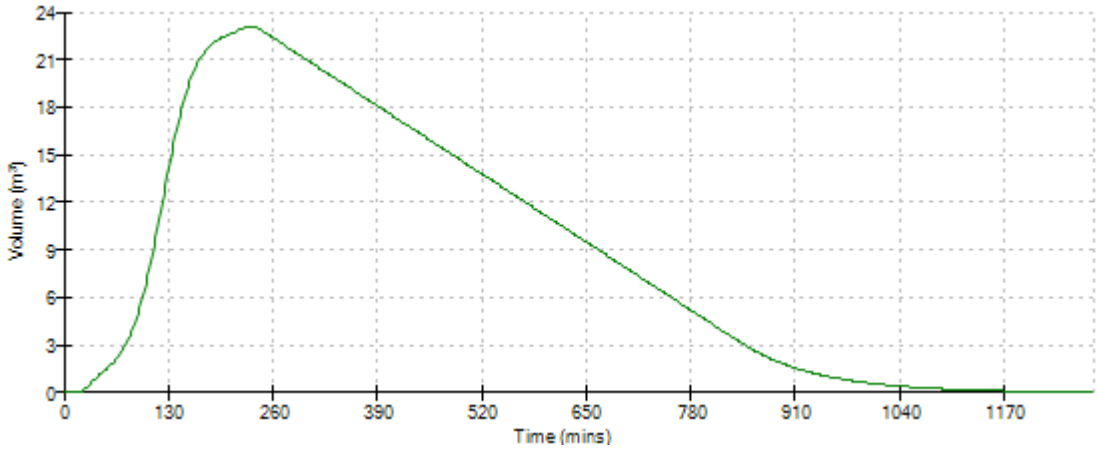
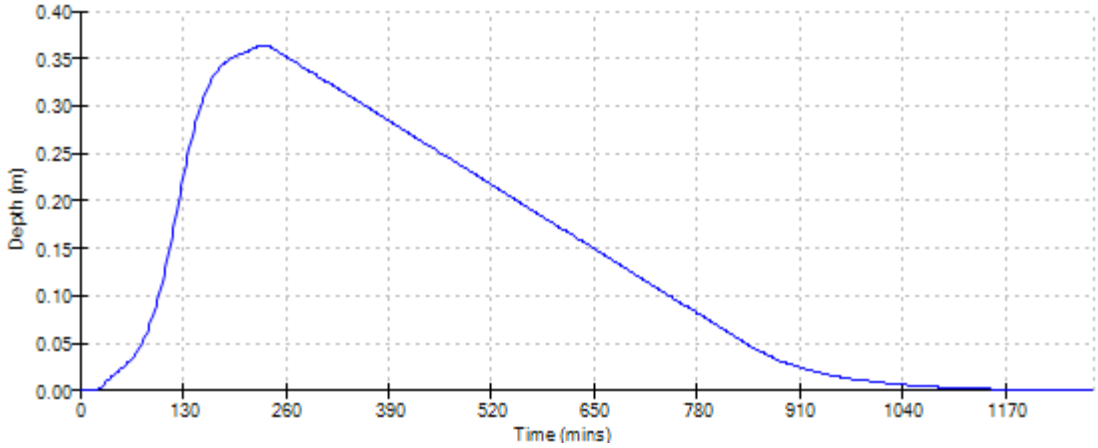
Event: 240 min Winter







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Summary of Results for 100 year Return Period (+40%)

Half Drain Time : 263 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	0.183	0.183	1.0	15.5	O K
30 min Summer	0.238	0.238	1.0	20.5	Flood Risk
60 min Summer	0.289	0.289	1.0	25.2	Flood Risk
120 min Summer	0.311	0.311	1.0	27.1	Flood Risk
180 min Summer	0.314	0.314	1.0	27.4	Flood Risk
240 min Summer	0.309	0.309	1.0	27.0	Flood Risk
360 min Summer	0.299	0.299	1.0	26.0	Flood Risk
480 min Summer	0.286	0.286	1.0	24.8	Flood Risk
600 min Summer	0.272	0.272	1.0	23.6	Flood Risk
720 min Summer	0.258	0.258	1.0	22.4	Flood Risk
960 min Summer	0.232	0.232	1.0	20.0	Flood Risk
1440 min Summer	0.185	0.185	1.0	15.7	O K
2160 min Summer	0.128	0.128	1.0	10.7	O K
2880 min Summer	0.087	0.087	1.0	7.2	O K
4320 min Summer	0.050	0.050	1.0	4.1	O K
5760 min Summer	0.041	0.041	0.8	3.4	O K
7200 min Summer	0.036	0.036	0.7	3.0	O K
8640 min Summer	0.032	0.032	0.7	2.7	O K
10080 min Summer	0.030	0.030	0.6	2.5	O K
15 min Winter	0.206	0.206	1.0	17.6	Flood Risk

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	137.200	0.0	18
30 min Summer	91.280	0.0	33
60 min Summer	58.100	0.0	62
120 min Summer	33.950	0.0	122
180 min Summer	24.762	0.0	180
240 min Summer	19.775	0.0	214
360 min Summer	14.373	0.0	274
480 min Summer	11.428	0.0	338
600 min Summer	9.554	0.0	406
720 min Summer	8.248	0.0	472
960 min Summer	6.538	0.0	608
1440 min Summer	4.702	0.0	866
2160 min Summer	3.393	0.0	1232
2880 min Summer	2.707	0.0	1560
4320 min Summer	1.993	0.0	2204
5760 min Summer	1.625	0.0	2936
7200 min Summer	1.405	0.0	3672
8640 min Summer	1.258	0.0	4408
10080 min Summer	1.155	0.0	5136
15 min Winter	137.200	0.0	18

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Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	0.267	0.267	1.0	23.1	Flood Risk
60 min Winter	0.327	0.327	1.0	28.6	Flood Risk
120 min Winter	0.355	0.355	1.0	31.1	Flood Risk
180 min Winter	0.362	0.362	1.0	31.7	Flood Risk
240 min Winter	0.359	0.359	1.0	31.5	Flood Risk
360 min Winter	0.344	0.344	1.0	30.1	Flood Risk
480 min Winter	0.326	0.326	1.0	28.5	Flood Risk
600 min Winter	0.307	0.307	1.0	26.8	Flood Risk
720 min Winter	0.287	0.287	1.0	25.0	Flood Risk
960 min Winter	0.248	0.248	1.0	21.4	Flood Risk
1440 min Winter	0.177	0.177	1.0	14.9	O K
2160 min Winter	0.092	0.092	1.0	7.7	O K
2880 min Winter	0.050	0.050	1.0	4.2	O K
4320 min Winter	0.037	0.037	0.8	3.1	O K
5760 min Winter	0.030	0.030	0.6	2.5	O K
7200 min Winter	0.026	0.026	0.5	2.2	O K
8640 min Winter	0.024	0.024	0.5	2.0	O K
10080 min Winter	0.022	0.022	0.4	1.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
30 min Winter	91.280	0.0	33
60 min Winter	58.100	0.0	62
120 min Winter	33.950	0.0	118
180 min Winter	24.762	0.0	176
240 min Winter	19.775	0.0	230
360 min Winter	14.373	0.0	294
480 min Winter	11.428	0.0	366
600 min Winter	9.554	0.0	442
720 min Winter	8.248	0.0	518
960 min Winter	6.538	0.0	662
1440 min Winter	4.702	0.0	924
2160 min Winter	3.393	0.0	1260
2880 min Winter	2.707	0.0	1500
4320 min Winter	1.993	0.0	2208
5760 min Winter	1.625	0.0	2944
7200 min Winter	1.405	0.0	3680
8640 min Winter	1.258	0.0	4328
10080 min Winter	1.155	0.0	5032

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Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 473800 105650 SU 73800 05650
Data Type	Catchment
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Shortest Storm (mins)	15
Longest Storm (mins)	10080
Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.066

Time (mins) From:	To:	Area (ha)
0	4	0.066

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Model Details

Storage is Online Cover Level (m) 0.500

Complex Structure

Porous Car Park

Infiltration Coefficient Base (m/hr)	0.03312	Width (m)	14.1
Membrane Percolation (mm/hr)	1000	Length (m)	14.1
Max Percolation (l/s)	55.2	Slope (1:X)	0.0
Safety Factor	2.0	Depression Storage (mm)	3
Porosity	0.30	Evaporation (mm/day)	1
Invert Level (m)	0.000	Membrane Depth (m)	130

Cellular Storage

Invert Level (m)	0.000	Safety Factor	2.0
Infiltration Coefficient Base (m/hr)	0.03312	Porosity	0.95
Infiltration Coefficient Side (m/hr)	0.00000		

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	25.0	25.0	0.150	25.0	25.0

Porous Car Park

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	5.0
Membrane Percolation (mm/hr)	1000	Length (m)	5.0
Max Percolation (l/s)	6.9	Slope (1:X)	0.0
Safety Factor	2.0	Depression Storage (mm)	3
Porosity	0.30	Evaporation (mm/day)	1
Invert Level (m)	0.150	Membrane Depth (m)	130

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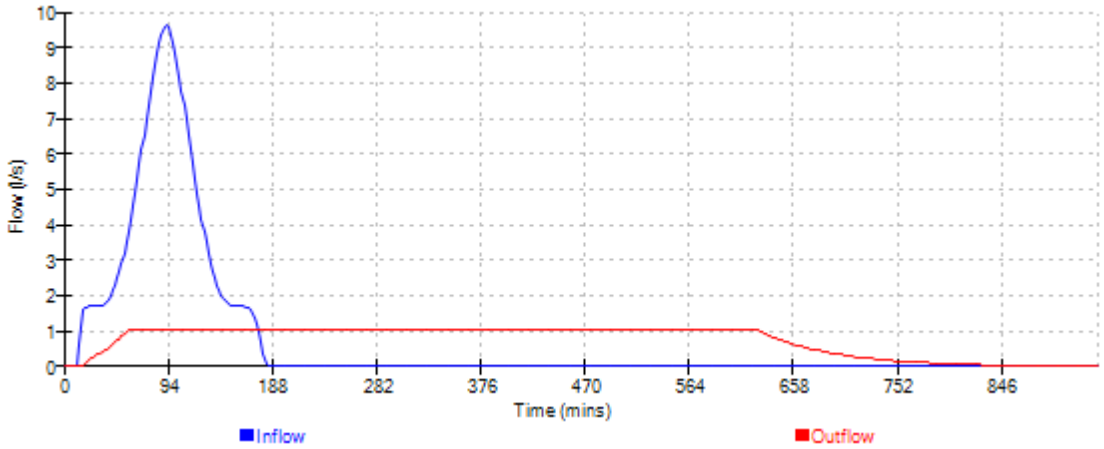
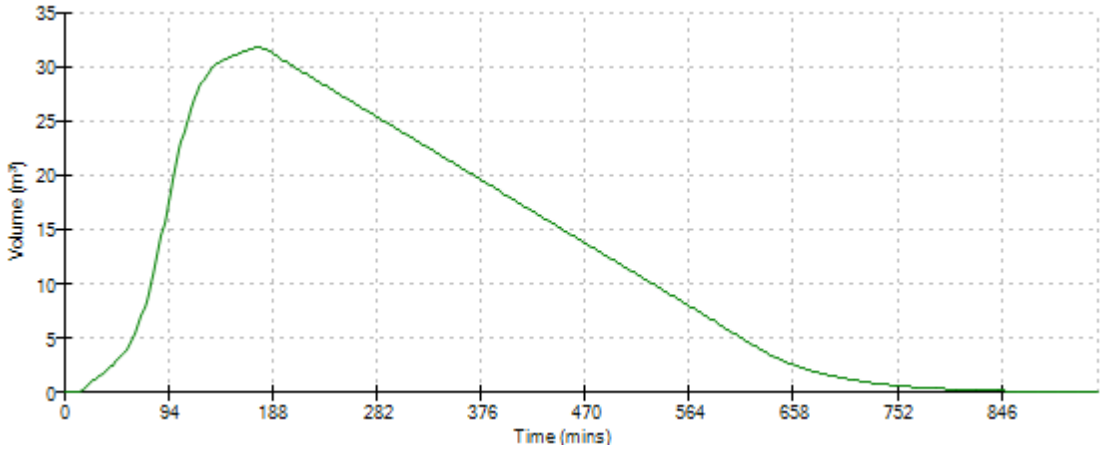
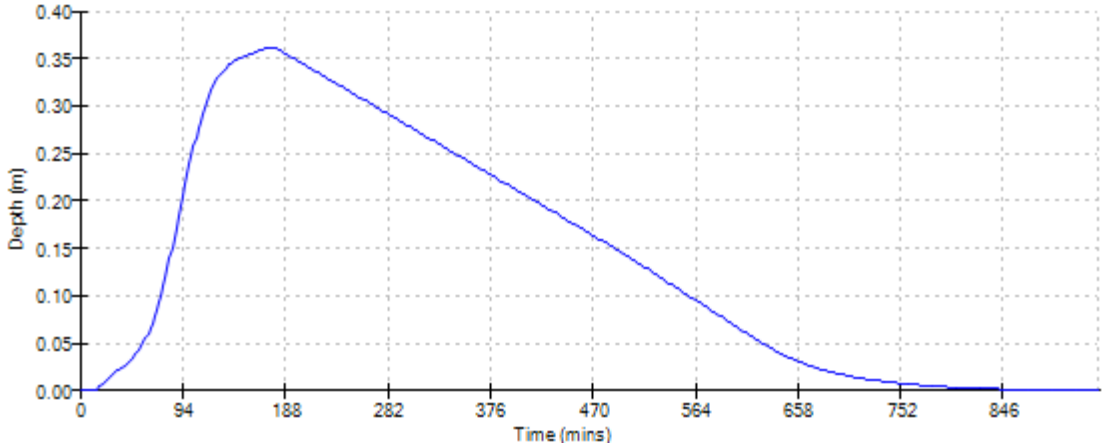
Event: 180 min Winter







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Summary of Results for 100 year Return Period (+40%)

Half Drain Time : 200 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	0.179	0.179	0.8	9.4	O K
30 min Summer	0.235	0.235	0.8	12.4	Flood Risk
60 min Summer	0.286	0.286	0.8	15.1	Flood Risk
120 min Summer	0.301	0.301	0.8	15.9	Flood Risk
180 min Summer	0.298	0.298	0.8	15.7	Flood Risk
240 min Summer	0.292	0.292	0.8	15.4	Flood Risk
360 min Summer	0.276	0.276	0.8	14.6	Flood Risk
480 min Summer	0.259	0.259	0.8	13.7	Flood Risk
600 min Summer	0.241	0.241	0.8	12.7	Flood Risk
720 min Summer	0.224	0.224	0.8	11.8	Flood Risk
960 min Summer	0.192	0.192	0.8	10.1	O K
1440 min Summer	0.137	0.137	0.8	7.2	O K
2160 min Summer	0.081	0.081	0.8	4.3	O K
2880 min Summer	0.053	0.053	0.8	2.8	O K
4320 min Summer	0.040	0.040	0.6	2.1	O K
5760 min Summer	0.033	0.033	0.5	1.7	O K
7200 min Summer	0.029	0.029	0.5	1.5	O K
8640 min Summer	0.026	0.026	0.4	1.4	O K
10080 min Summer	0.024	0.024	0.4	1.2	O K
15 min Winter	0.202	0.202	0.8	10.7	Flood Risk

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	137.200	0.0	18
30 min Summer	91.280	0.0	33
60 min Summer	58.100	0.0	62
120 min Summer	33.950	0.0	120
180 min Summer	24.762	0.0	160
240 min Summer	19.775	0.0	190
360 min Summer	14.373	0.0	254
480 min Summer	11.428	0.0	322
600 min Summer	9.554	0.0	388
720 min Summer	8.248	0.0	456
960 min Summer	6.538	0.0	588
1440 min Summer	4.702	0.0	836
2160 min Summer	3.393	0.0	1172
2880 min Summer	2.707	0.0	1496
4320 min Summer	1.993	0.0	2204
5760 min Summer	1.625	0.0	2936
7200 min Summer	1.405	0.0	3672
8640 min Summer	1.258	0.0	4400
10080 min Summer	1.155	0.0	5136
15 min Winter	137.200	0.0	18

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Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	0.266	0.266	0.8	14.1	Flood Risk
60 min Winter	0.326	0.326	0.8	17.2	Flood Risk
120 min Winter	0.348	0.348	0.8	18.4	Flood Risk
180 min Winter	0.347	0.347	0.8	18.3	Flood Risk
240 min Winter	0.338	0.338	0.8	17.8	Flood Risk
360 min Winter	0.317	0.317	0.8	16.8	Flood Risk
480 min Winter	0.292	0.292	0.8	15.4	Flood Risk
600 min Winter	0.266	0.266	0.8	14.1	Flood Risk
720 min Winter	0.240	0.240	0.8	12.7	Flood Risk
960 min Winter	0.191	0.191	0.8	10.1	O K
1440 min Winter	0.111	0.111	0.8	5.8	O K
2160 min Winter	0.049	0.049	0.8	2.6	O K
2880 min Winter	0.040	0.040	0.6	2.1	O K
4320 min Winter	0.029	0.029	0.5	1.6	O K
5760 min Winter	0.024	0.024	0.4	1.3	O K
7200 min Winter	0.021	0.021	0.3	1.1	O K
8640 min Winter	0.019	0.019	0.3	1.0	O K
10080 min Winter	0.017	0.017	0.3	0.9	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
30 min Winter	91.280	0.0	32
60 min Winter	58.100	0.0	62
120 min Winter	33.950	0.0	118
180 min Winter	24.762	0.0	172
240 min Winter	19.775	0.0	222
360 min Winter	14.373	0.0	276
480 min Winter	11.428	0.0	350
600 min Winter	9.554	0.0	424
720 min Winter	8.248	0.0	496
960 min Winter	6.538	0.0	628
1440 min Winter	4.702	0.0	866
2160 min Winter	3.393	0.0	1128
2880 min Winter	2.707	0.0	1496
4320 min Winter	1.993	0.0	2208
5760 min Winter	1.625	0.0	2912
7200 min Winter	1.405	0.0	3672
8640 min Winter	1.258	0.0	4296
10080 min Winter	1.155	0.0	4984

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Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 473800 105650 SU 73800 05650
Data Type	Catchment
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Shortest Storm (mins)	15
Longest Storm (mins)	10080
Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.041

Time (mins) From:	To:	Area (ha)
0	4	0.041

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Model Details

Storage is Online Cover Level (m) 0.500

Porous Car Park Structure

Infiltration Coefficient Base (m/hr)	0.03312	Width (m)	11.0
Membrane Percolation (mm/hr)	1000	Length (m)	16.0
Max Percolation (l/s)	48.9	Slope (1:X)	0.0
Safety Factor	2.0	Depression Storage (mm)	3
Porosity	0.30	Evaporation (mm/day)	1
Invert Level (m)	0.000	Membrane Depth (m)	130

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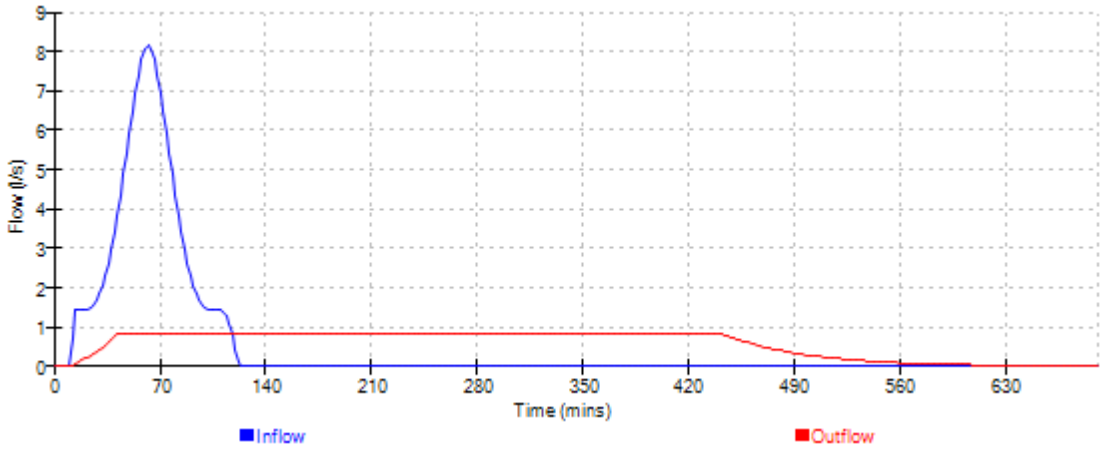
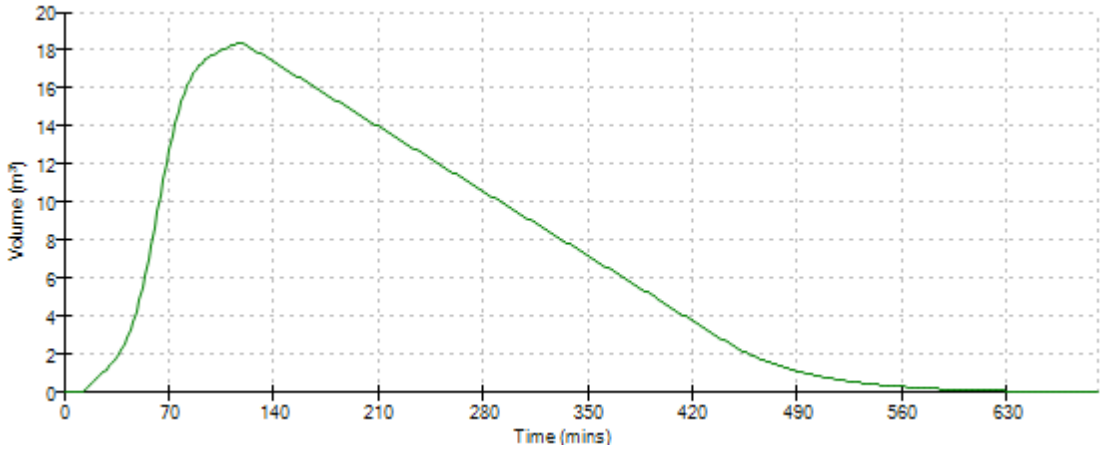
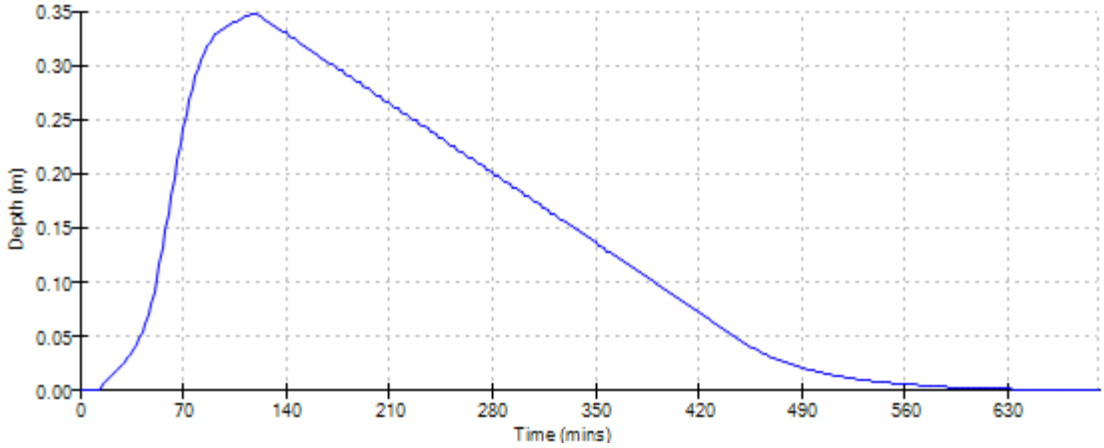
Event: 120 min Winter







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Summary of Results for 100 year Return Period (+40%)

Half Drain Time : 412 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	0.154	0.154	0.9	20.4	O K
30 min Summer	0.201	0.201	0.9	27.1	Flood Risk
60 min Summer	0.248	0.248	0.9	33.8	Flood Risk
120 min Summer	0.275	0.275	0.9	37.6	Flood Risk
180 min Summer	0.285	0.285	0.9	39.1	Flood Risk
240 min Summer	0.289	0.289	0.9	39.6	Flood Risk
360 min Summer	0.285	0.285	0.9	39.1	Flood Risk
480 min Summer	0.279	0.279	0.9	38.2	Flood Risk
600 min Summer	0.271	0.271	0.9	37.1	Flood Risk
720 min Summer	0.264	0.264	0.9	36.0	Flood Risk
960 min Summer	0.248	0.248	0.9	33.7	Flood Risk
1440 min Summer	0.217	0.217	0.9	29.3	Flood Risk
2160 min Summer	0.176	0.176	0.9	23.5	O K
2880 min Summer	0.143	0.143	0.9	18.8	O K
4320 min Summer	0.092	0.092	0.9	12.2	O K
5760 min Summer	0.063	0.063	0.9	8.3	O K
7200 min Summer	0.050	0.050	0.9	6.6	O K
8640 min Summer	0.046	0.046	0.9	6.0	O K
10080 min Summer	0.042	0.042	0.8	5.6	O K
15 min Winter	0.173	0.173	0.9	23.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	137.200	0.0	19
30 min Summer	91.280	0.0	33
60 min Summer	58.100	0.0	62
120 min Summer	33.950	0.0	122
180 min Summer	24.762	0.0	182
240 min Summer	19.775	0.0	240
360 min Summer	14.373	0.0	330
480 min Summer	11.428	0.0	386
600 min Summer	9.554	0.0	446
720 min Summer	8.248	0.0	512
960 min Summer	6.538	0.0	646
1440 min Summer	4.702	0.0	912
2160 min Summer	3.393	0.0	1300
2880 min Summer	2.707	0.0	1676
4320 min Summer	1.993	0.0	2380
5760 min Summer	1.625	0.0	3056
7200 min Summer	1.405	0.0	3680
8640 min Summer	1.258	0.0	4408
10080 min Summer	1.155	0.0	5144
15 min Winter	137.200	0.0	18

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Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	0.226	0.226	0.9	30.6	Flood Risk
60 min Winter	0.280	0.280	0.9	38.3	Flood Risk
120 min Winter	0.311	0.311	0.9	42.8	Flood Risk
180 min Winter	0.325	0.325	0.9	44.8	Flood Risk
240 min Winter	0.331	0.331	0.9	45.6	Flood Risk
360 min Winter	0.331	0.331	0.9	45.6	Flood Risk
480 min Winter	0.322	0.322	0.9	44.3	Flood Risk
600 min Winter	0.311	0.311	0.9	42.8	Flood Risk
720 min Winter	0.301	0.301	0.9	41.4	Flood Risk
960 min Winter	0.279	0.279	0.9	38.2	Flood Risk
1440 min Winter	0.233	0.233	0.9	31.6	Flood Risk
2160 min Winter	0.172	0.172	0.9	22.9	O K
2880 min Winter	0.121	0.121	0.9	15.9	O K
4320 min Winter	0.056	0.056	0.9	7.3	O K
5760 min Winter	0.043	0.043	0.8	5.7	O K
7200 min Winter	0.038	0.038	0.7	5.0	O K
8640 min Winter	0.034	0.034	0.6	4.4	O K
10080 min Winter	0.031	0.031	0.6	4.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
30 min Winter	91.280	0.0	33
60 min Winter	58.100	0.0	62
120 min Winter	33.950	0.0	120
180 min Winter	24.762	0.0	178
240 min Winter	19.775	0.0	234
360 min Winter	14.373	0.0	346
480 min Winter	11.428	0.0	448
600 min Winter	9.554	0.0	480
720 min Winter	8.248	0.0	554
960 min Winter	6.538	0.0	704
1440 min Winter	4.702	0.0	996
2160 min Winter	3.393	0.0	1404
2880 min Winter	2.707	0.0	1760
4320 min Winter	1.993	0.0	2336
5760 min Winter	1.625	0.0	2992
7200 min Winter	1.405	0.0	3680
8640 min Winter	1.258	0.0	4416
10080 min Winter	1.155	0.0	5136

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Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 473800 105650 SU 73800 05650
Data Type	Catchment
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Shortest Storm (mins)	15
Longest Storm (mins)	10080
Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.086

Time (mins) From:	To:	Area (ha)
0	4	0.086

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Model Details

Storage is Online Cover Level (m) 0.500

Complex Structure

Porous Car Park

Infiltration Coefficient Base (m/hr)	0.01872	Width (m)	17.9
Membrane Percolation (mm/hr)	1000	Length (m)	17.9
Max Percolation (l/s)	89.0	Slope (1:X)	0.0
Safety Factor	2.0	Depression Storage (mm)	3
Porosity	0.30	Evaporation (mm/day)	1
Invert Level (m)	0.000	Membrane Depth (m)	130

Cellular Storage

Invert Level (m)	0.000	Safety Factor	2.0
Infiltration Coefficient Base (m/hr)	0.01872	Porosity	0.95
Infiltration Coefficient Side (m/hr)	0.00000		

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	37.5	37.5	0.150	37.5	37.5

Porous Car Park

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	6.1
Membrane Percolation (mm/hr)	1000	Length (m)	6.1
Max Percolation (l/s)	10.3	Slope (1:X)	0.0
Safety Factor	2.0	Depression Storage (mm)	3
Porosity	0.30	Evaporation (mm/day)	1
Invert Level (m)	0.150	Membrane Depth (m)	130

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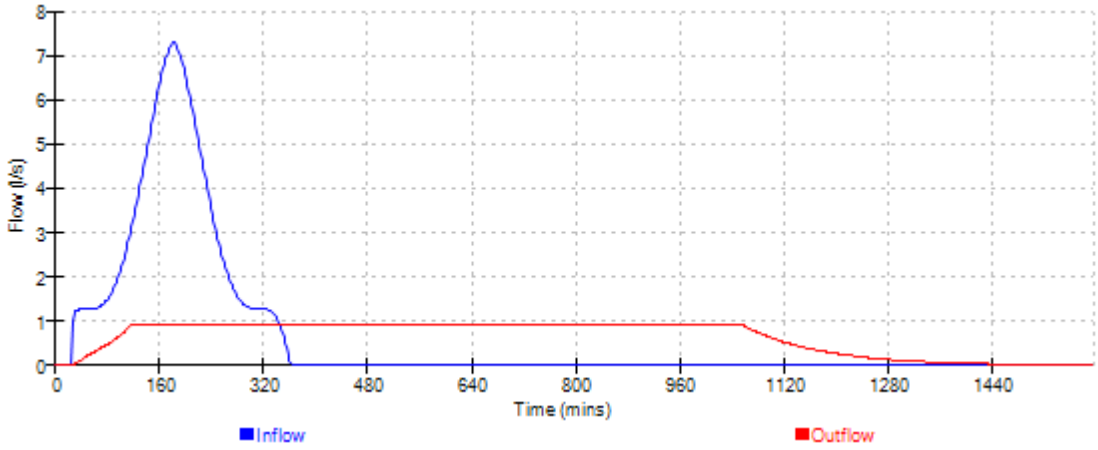
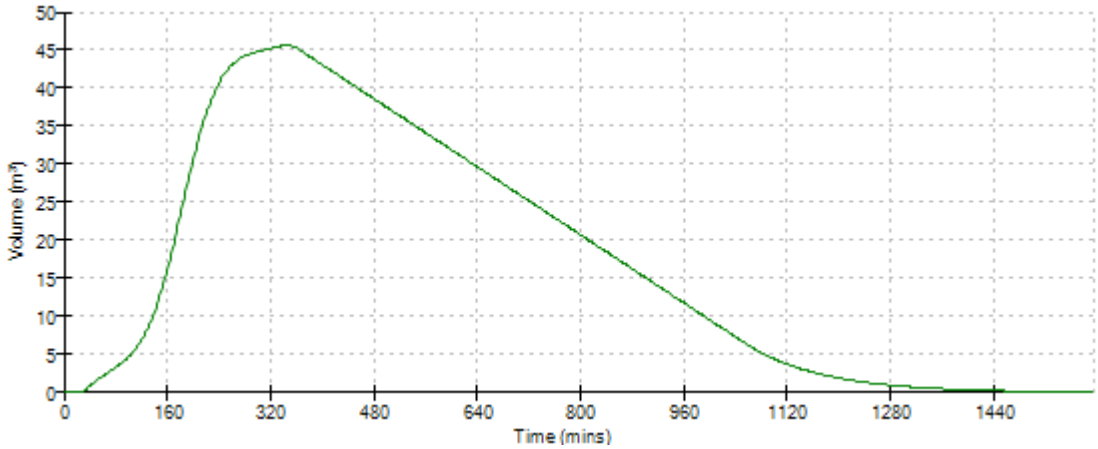
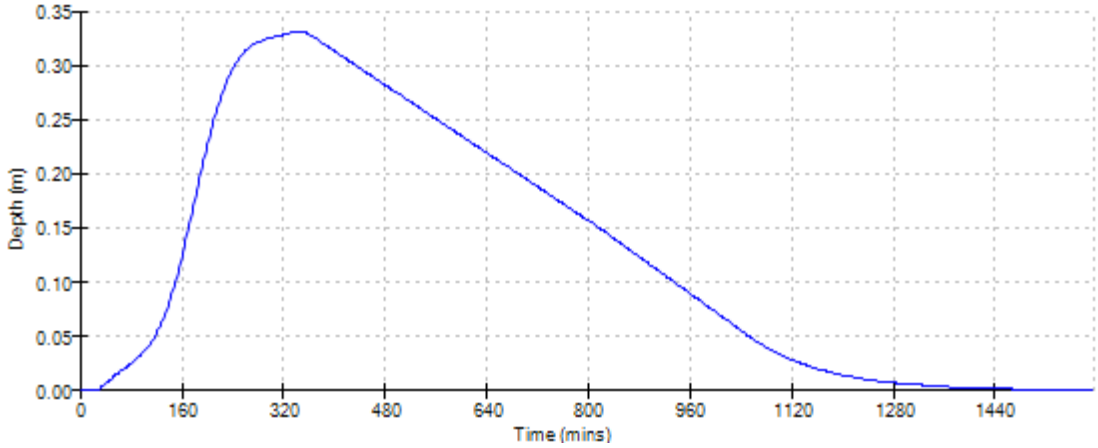
Event: 360 min Winter







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Summary of Results for 100 year Return Period (+40%)

Half Drain Time : 407 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	0.168	0.168	2.1	44.7	O K
30 min Summer	0.221	0.221	2.1	59.4	Flood Risk
60 min Summer	0.274	0.274	2.1	74.2	Flood Risk
120 min Summer	0.304	0.304	2.1	82.3	Flood Risk
180 min Summer	0.315	0.315	2.1	85.5	Flood Risk
240 min Summer	0.319	0.319	2.1	86.5	Flood Risk
360 min Summer	0.314	0.314	2.1	85.2	Flood Risk
480 min Summer	0.306	0.306	2.1	83.0	Flood Risk
600 min Summer	0.297	0.297	2.1	80.5	Flood Risk
720 min Summer	0.288	0.288	2.1	78.0	Flood Risk
960 min Summer	0.270	0.270	2.1	72.9	Flood Risk
1440 min Summer	0.234	0.234	2.1	63.0	Flood Risk
2160 min Summer	0.188	0.188	2.1	50.2	O K
2880 min Summer	0.150	0.150	2.1	39.8	O K
4320 min Summer	0.095	0.095	2.1	25.1	O K
5760 min Summer	0.063	0.063	2.1	16.7	O K
7200 min Summer	0.050	0.050	2.1	13.2	O K
8640 min Summer	0.045	0.045	1.9	12.0	O K
10080 min Summer	0.042	0.042	1.7	11.1	O K
15 min Winter	0.189	0.189	2.1	50.5	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	137.200	0.0	19
30 min Summer	91.280	0.0	33
60 min Summer	58.100	0.0	62
120 min Summer	33.950	0.0	122
180 min Summer	24.762	0.0	182
240 min Summer	19.775	0.0	240
360 min Summer	14.373	0.0	328
480 min Summer	11.428	0.0	384
600 min Summer	9.554	0.0	446
720 min Summer	8.248	0.0	508
960 min Summer	6.538	0.0	646
1440 min Summer	4.702	0.0	910
2160 min Summer	3.393	0.0	1300
2880 min Summer	2.707	0.0	1672
4320 min Summer	1.993	0.0	2376
5760 min Summer	1.625	0.0	3048
7200 min Summer	1.405	0.0	3680
8640 min Summer	1.258	0.0	4408
10080 min Summer	1.155	0.0	5144
15 min Winter	137.200	0.0	18

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Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	0.249	0.249	2.1	67.1	Flood Risk
60 min Winter	0.310	0.310	2.1	84.0	Flood Risk
120 min Winter	0.345	0.345	2.1	93.7	Flood Risk
180 min Winter	0.360	0.360	2.1	98.0	Flood Risk
240 min Winter	0.366	0.366	2.1	99.7	Flood Risk
360 min Winter	0.365	0.365	2.1	99.5	Flood Risk
480 min Winter	0.355	0.355	2.1	96.5	Flood Risk
600 min Winter	0.342	0.342	2.1	93.1	Flood Risk
720 min Winter	0.331	0.331	2.1	89.8	Flood Risk
960 min Winter	0.305	0.305	2.1	82.6	Flood Risk
1440 min Winter	0.251	0.251	2.1	67.9	Flood Risk
2160 min Winter	0.181	0.181	2.1	48.4	O K
2880 min Winter	0.124	0.124	2.1	32.9	O K
4320 min Winter	0.055	0.055	2.1	14.5	O K
5760 min Winter	0.043	0.043	1.8	11.4	O K
7200 min Winter	0.037	0.037	1.5	9.8	O K
8640 min Winter	0.033	0.033	1.4	8.9	O K
10080 min Winter	0.031	0.031	1.3	8.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
30 min Winter	91.280	0.0	33
60 min Winter	58.100	0.0	62
120 min Winter	33.950	0.0	120
180 min Winter	24.762	0.0	178
240 min Winter	19.775	0.0	234
360 min Winter	14.373	0.0	346
480 min Winter	11.428	0.0	446
600 min Winter	9.554	0.0	476
720 min Winter	8.248	0.0	552
960 min Winter	6.538	0.0	704
1440 min Winter	4.702	0.0	996
2160 min Winter	3.393	0.0	1388
2880 min Winter	2.707	0.0	1756
4320 min Winter	1.993	0.0	2332
5760 min Winter	1.625	0.0	2992
7200 min Winter	1.405	0.0	3680
8640 min Winter	1.258	0.0	4416
10080 min Winter	1.155	0.0	5144

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Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 473800 105650 SU 73800 05650
Data Type	Catchment
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Shortest Storm (mins)	15
Longest Storm (mins)	10080
Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.189

Time (mins) From:	To:	Area (ha)
0	4	0.189

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Model Details

Storage is Online Cover Level (m) 0.500

Complex Structure

Porous Car Park

Infiltration Coefficient Base (m/hr)	0.01872	Width (m)	157.7
Membrane Percolation (mm/hr)	1000	Length (m)	4.8
Max Percolation (l/s)	210.3	Slope (1:X)	0.0
Safety Factor	2.0	Depression Storage (mm)	3
Porosity	0.30	Evaporation (mm/day)	1
Invert Level (m)	0.000	Membrane Depth (m)	130

Cellular Storage

Invert Level (m)	0.000	Safety Factor	2.0
Infiltration Coefficient Base (m/hr)	0.01872	Porosity	0.95
Infiltration Coefficient Side (m/hr)	0.00000		

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	40.0	40.0	0.150	40.0	40.0

Porous Car Park

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	6.3
Membrane Percolation (mm/hr)	1000	Length (m)	6.3
Max Percolation (l/s)	11.0	Slope (1:X)	0.0
Safety Factor	2.0	Depression Storage (mm)	3
Porosity	0.30	Evaporation (mm/day)	1
Invert Level (m)	0.150	Membrane Depth (m)	130

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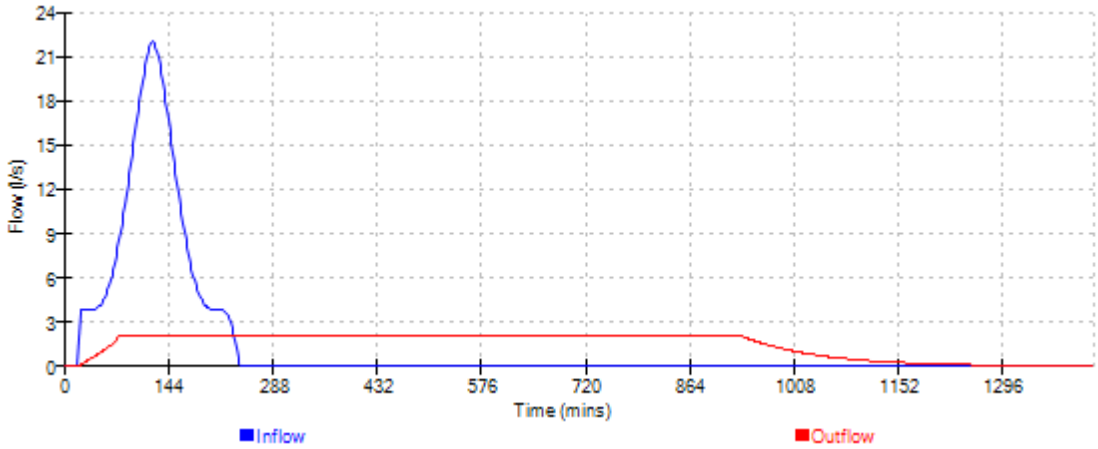
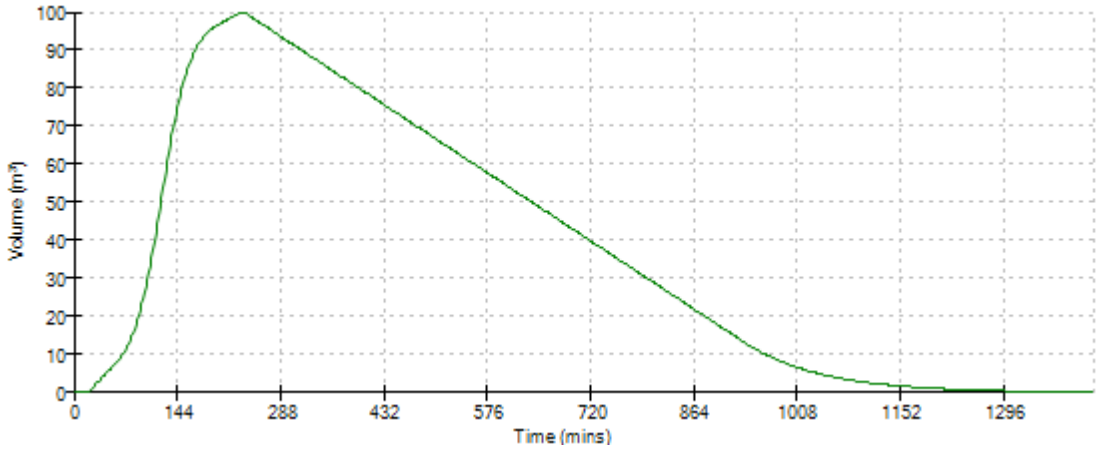
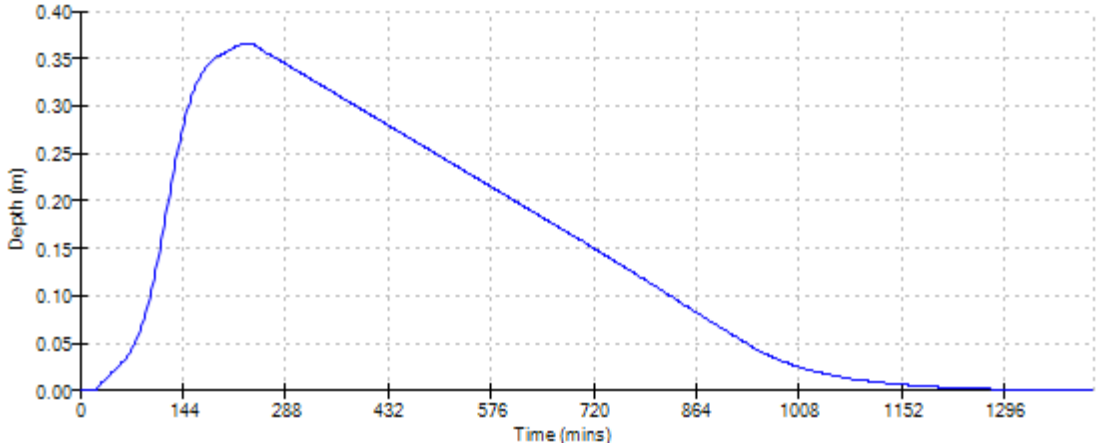
Event: 240 min Winter







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Summary of Results for 100 year Return Period (+40%)

Half Drain Time : 941 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	0.122	0.122	0.5	22.0	O K
30 min Summer	0.161	0.161	0.5	29.1	O K
60 min Summer	0.202	0.202	0.5	36.5	Flood Risk
120 min Summer	0.230	0.230	0.5	41.5	Flood Risk
180 min Summer	0.246	0.246	0.5	44.3	Flood Risk
240 min Summer	0.255	0.255	0.5	46.0	Flood Risk
360 min Summer	0.265	0.265	0.5	47.9	Flood Risk
480 min Summer	0.268	0.268	0.5	48.4	Flood Risk
600 min Summer	0.268	0.268	0.5	48.3	Flood Risk
720 min Summer	0.265	0.265	0.5	47.8	Flood Risk
960 min Summer	0.258	0.258	0.5	46.6	Flood Risk
1440 min Summer	0.244	0.244	0.5	44.0	Flood Risk
2160 min Summer	0.224	0.224	0.5	40.5	Flood Risk
2880 min Summer	0.207	0.207	0.5	37.4	Flood Risk
4320 min Summer	0.178	0.178	0.5	32.1	O K
5760 min Summer	0.155	0.155	0.5	28.0	O K
7200 min Summer	0.137	0.137	0.5	24.8	O K
8640 min Summer	0.123	0.123	0.5	22.2	O K
10080 min Summer	0.112	0.112	0.5	20.2	O K
15 min Winter	0.137	0.137	0.5	24.7	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	137.200	0.0	19
30 min Summer	91.280	0.0	34
60 min Summer	58.100	0.0	64
120 min Summer	33.950	0.0	124
180 min Summer	24.762	0.0	182
240 min Summer	19.775	0.0	242
360 min Summer	14.373	0.0	362
480 min Summer	11.428	0.0	482
600 min Summer	9.554	0.0	600
720 min Summer	8.248	0.0	704
960 min Summer	6.538	0.0	808
1440 min Summer	4.702	0.0	1050
2160 min Summer	3.393	0.0	1452
2880 min Summer	2.707	0.0	1848
4320 min Summer	1.993	0.0	2640
5760 min Summer	1.625	0.0	3456
7200 min Summer	1.405	0.0	4184
8640 min Summer	1.258	0.0	4928
10080 min Summer	1.155	0.0	5648
15 min Winter	137.200	0.0	19

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Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	0.181	0.181	0.5	32.6	O K
60 min Winter	0.227	0.227	0.5	41.0	Flood Risk
120 min Winter	0.259	0.259	0.5	46.8	Flood Risk
180 min Winter	0.277	0.277	0.5	50.1	Flood Risk
240 min Winter	0.289	0.289	0.5	52.2	Flood Risk
360 min Winter	0.302	0.302	0.5	54.5	Flood Risk
480 min Winter	0.308	0.308	0.5	55.5	Flood Risk
600 min Winter	0.309	0.309	0.5	55.7	Flood Risk
720 min Winter	0.307	0.307	0.5	55.5	Flood Risk
960 min Winter	0.300	0.300	0.5	54.2	Flood Risk
1440 min Winter	0.281	0.281	0.5	50.7	Flood Risk
2160 min Winter	0.254	0.254	0.5	45.8	Flood Risk
2880 min Winter	0.228	0.228	0.5	41.1	Flood Risk
4320 min Winter	0.182	0.182	0.5	32.8	O K
5760 min Winter	0.145	0.145	0.5	26.1	O K
7200 min Winter	0.116	0.116	0.5	20.9	O K
8640 min Winter	0.093	0.093	0.5	16.8	O K
10080 min Winter	0.075	0.075	0.5	13.6	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
30 min Winter	91.280	0.0	33
60 min Winter	58.100	0.0	62
120 min Winter	33.950	0.0	122
180 min Winter	24.762	0.0	180
240 min Winter	19.775	0.0	238
360 min Winter	14.373	0.0	354
480 min Winter	11.428	0.0	470
600 min Winter	9.554	0.0	584
720 min Winter	8.248	0.0	694
960 min Winter	6.538	0.0	906
1440 min Winter	4.702	0.0	1126
2160 min Winter	3.393	0.0	1580
2880 min Winter	2.707	0.0	2020
4320 min Winter	1.993	0.0	2856
5760 min Winter	1.625	0.0	3640
7200 min Winter	1.405	0.0	4392
8640 min Winter	1.258	0.0	5104
10080 min Winter	1.155	0.0	5752

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Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 473800 105650 SU 73800 05650
Data Type	Catchment
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Shortest Storm (mins)	15
Longest Storm (mins)	10080
Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.087

Time (mins) From:	To:	Area (ha)
0	4	0.087

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Model Details

Storage is Online Cover Level (m) 0.500

Cellular Storage Structure

Invert Level (m) 0.000 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.01872 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	190.0	190.0	0.351	0.0	190.0
0.350	190.0	190.0			

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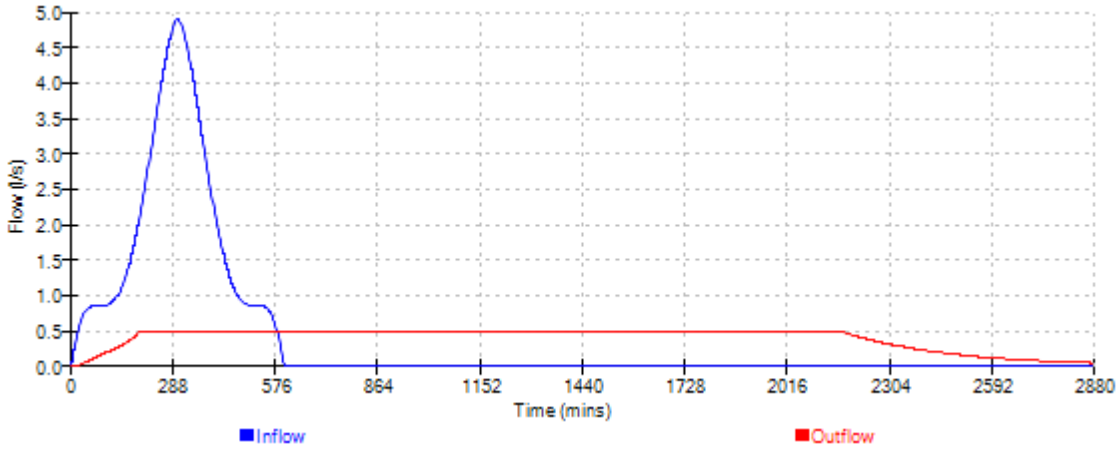
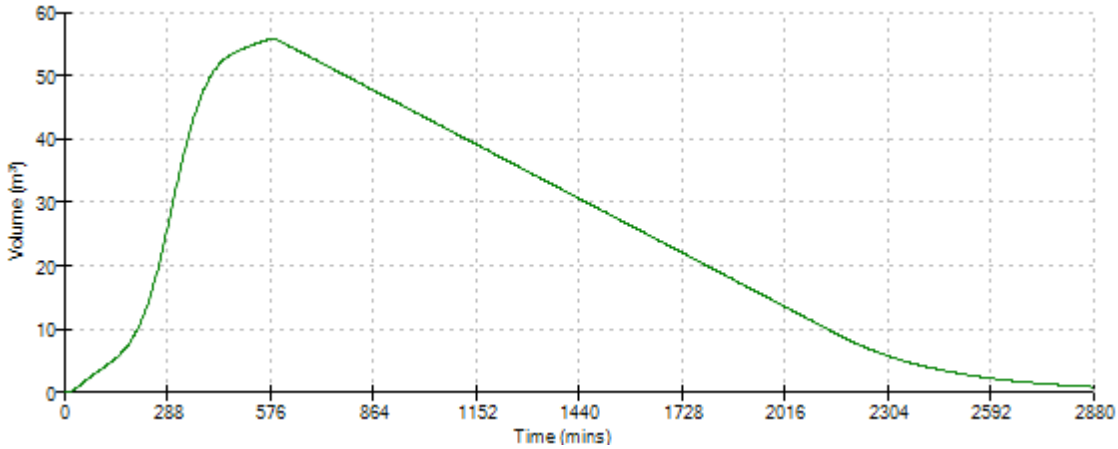
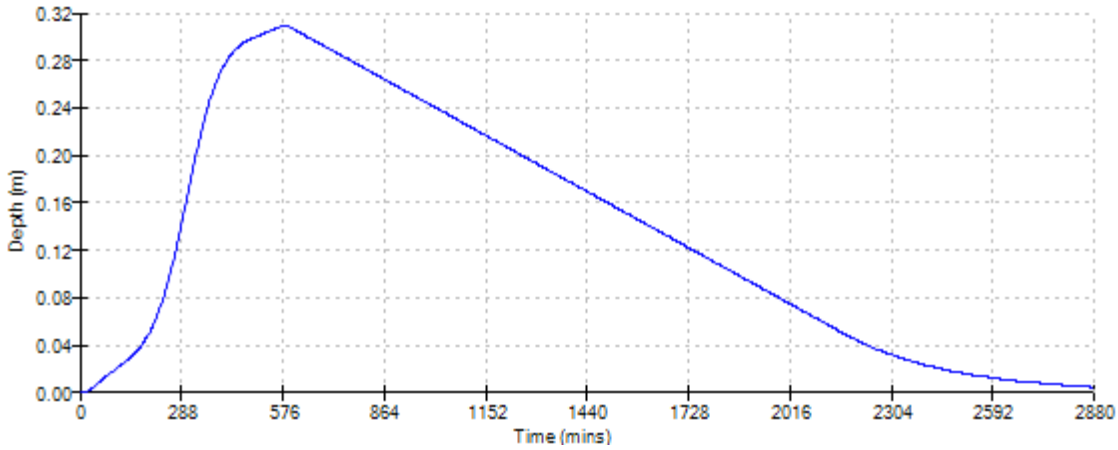
Event: 600 min Winter







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Summary of Results for 100 year Return Period (+40%)

Half Drain Time : 972 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	0.136	0.136	0.3	15.2	O K
30 min Summer	0.179	0.179	0.3	20.1	O K
60 min Summer	0.225	0.225	0.3	25.2	Flood Risk
120 min Summer	0.256	0.256	0.3	28.7	Flood Risk
180 min Summer	0.273	0.273	0.3	30.6	Flood Risk
240 min Summer	0.284	0.284	0.3	31.8	Flood Risk
360 min Summer	0.295	0.295	0.3	33.1	Flood Risk
480 min Summer	0.299	0.299	0.3	33.5	Flood Risk
600 min Summer	0.299	0.299	0.3	33.5	Flood Risk
720 min Summer	0.296	0.296	0.3	33.1	Flood Risk
960 min Summer	0.288	0.288	0.3	32.3	Flood Risk
1440 min Summer	0.273	0.273	0.3	30.7	Flood Risk
2160 min Summer	0.253	0.253	0.3	28.3	Flood Risk
2880 min Summer	0.235	0.235	0.3	26.3	Flood Risk
4320 min Summer	0.205	0.205	0.3	23.0	Flood Risk
5760 min Summer	0.181	0.181	0.3	20.3	O K
7200 min Summer	0.163	0.163	0.3	18.2	O K
8640 min Summer	0.148	0.148	0.3	16.6	O K
10080 min Summer	0.136	0.136	0.3	15.2	O K
15 min Winter	0.152	0.152	0.3	17.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	137.200	0.0	19
30 min Summer	91.280	0.0	34
60 min Summer	58.100	0.0	64
120 min Summer	33.950	0.0	124
180 min Summer	24.762	0.0	182
240 min Summer	19.775	0.0	242
360 min Summer	14.373	0.0	362
480 min Summer	11.428	0.0	482
600 min Summer	9.554	0.0	600
720 min Summer	8.248	0.0	712
960 min Summer	6.538	0.0	808
1440 min Summer	4.702	0.0	1052
2160 min Summer	3.393	0.0	1452
2880 min Summer	2.707	0.0	1872
4320 min Summer	1.993	0.0	2680
5760 min Summer	1.625	0.0	3456
7200 min Summer	1.405	0.0	4248
8640 min Summer	1.258	0.0	5008
10080 min Summer	1.155	0.0	5744
15 min Winter	137.200	0.0	19

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Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	0.201	0.201	0.3	22.5	Flood Risk
60 min Winter	0.253	0.253	0.3	28.3	Flood Risk
120 min Winter	0.288	0.288	0.3	32.3	Flood Risk
180 min Winter	0.309	0.309	0.3	34.6	Flood Risk
240 min Winter	0.322	0.322	0.3	36.0	Flood Risk
360 min Winter	0.336	0.336	0.3	37.7	Flood Risk
480 min Winter	0.342	0.342	0.3	38.4	Flood Risk
600 min Winter	0.344	0.344	0.3	38.5	Flood Risk
720 min Winter	0.342	0.342	0.3	38.4	Flood Risk
960 min Winter	0.335	0.335	0.3	37.5	Flood Risk
1440 min Winter	0.315	0.315	0.3	35.3	Flood Risk
2160 min Winter	0.287	0.287	0.3	32.1	Flood Risk
2880 min Winter	0.260	0.260	0.3	29.1	Flood Risk
4320 min Winter	0.213	0.213	0.3	23.8	Flood Risk
5760 min Winter	0.174	0.174	0.3	19.5	O K
7200 min Winter	0.144	0.144	0.3	16.1	O K
8640 min Winter	0.120	0.120	0.3	13.4	O K
10080 min Winter	0.100	0.100	0.3	11.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
30 min Winter	91.280	0.0	33
60 min Winter	58.100	0.0	62
120 min Winter	33.950	0.0	122
180 min Winter	24.762	0.0	180
240 min Winter	19.775	0.0	238
360 min Winter	14.373	0.0	354
480 min Winter	11.428	0.0	470
600 min Winter	9.554	0.0	582
720 min Winter	8.248	0.0	694
960 min Winter	6.538	0.0	904
1440 min Winter	4.702	0.0	1126
2160 min Winter	3.393	0.0	1580
2880 min Winter	2.707	0.0	2020
4320 min Winter	1.993	0.0	2892
5760 min Winter	1.625	0.0	3688
7200 min Winter	1.405	0.0	4464
8640 min Winter	1.258	0.0	5192
10080 min Winter	1.155	0.0	5944

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Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 473800 105650 SU 73800 05650
Data Type	Catchment
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Shortest Storm (mins)	15
Longest Storm (mins)	10080
Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.060

Time (mins) From:	To:	Area (ha)
0	4	0.060

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Model Details

Storage is Online Cover Level (m) 0.500

Cellular Storage Structure

Invert Level (m) 0.000 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.01872 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.01872

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	118.0	118.0	0.351	0.0	133.2
0.350	118.0	133.2			

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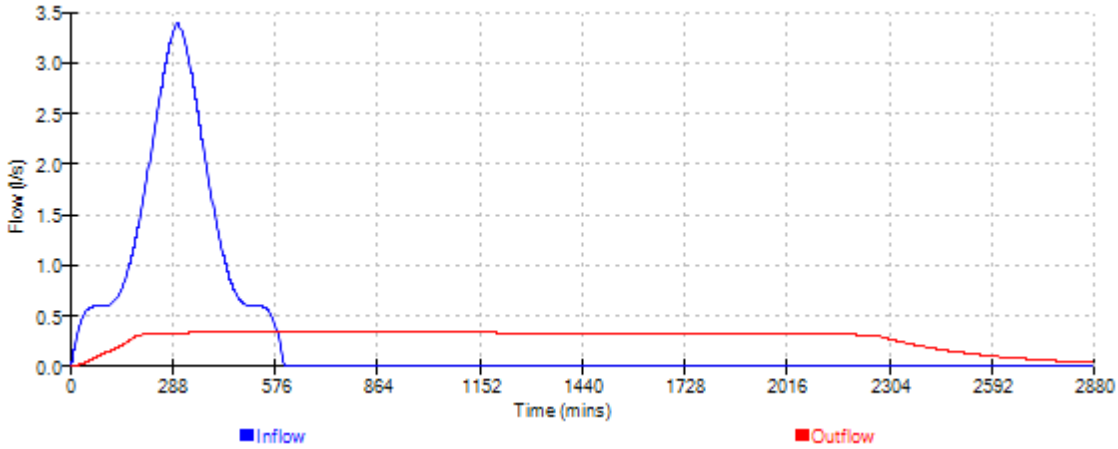
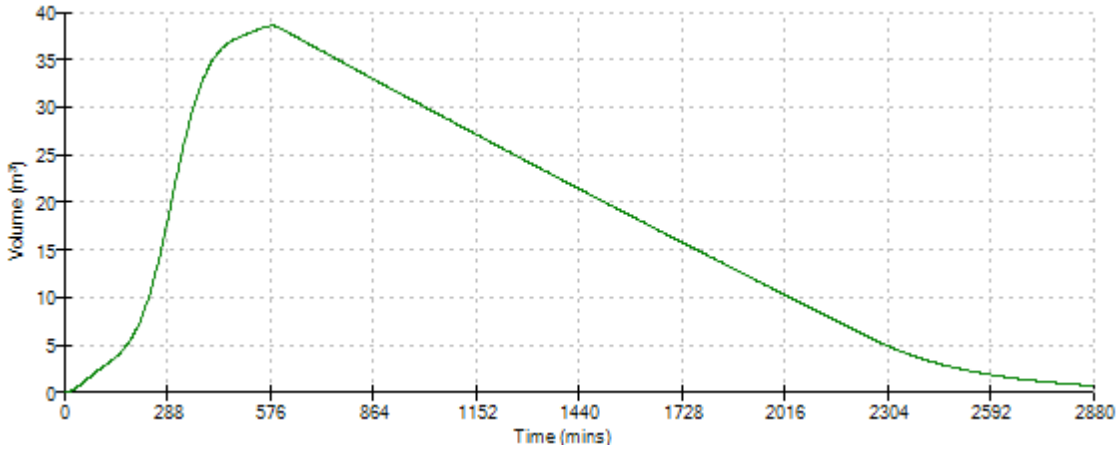
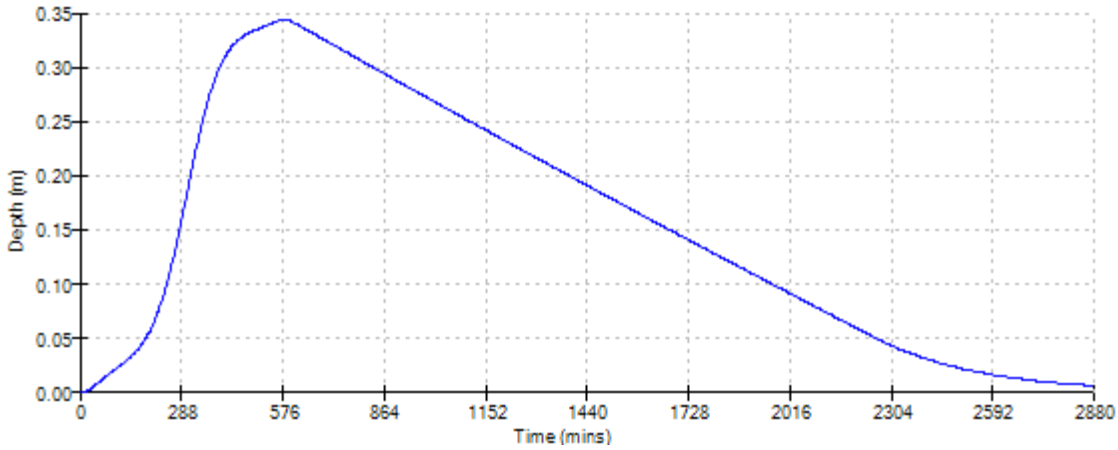
Event: 600 min Winter







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Summary of Results for 100 year Return Period (+40%)

Half Drain Time : 579 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	0.144	0.144	0.3	8.8	O K
30 min Summer	0.190	0.190	0.3	11.6	O K
60 min Summer	0.237	0.237	0.3	14.4	Flood Risk
120 min Summer	0.265	0.265	0.3	16.1	Flood Risk
180 min Summer	0.279	0.279	0.3	17.0	Flood Risk
240 min Summer	0.286	0.286	0.3	17.4	Flood Risk
360 min Summer	0.289	0.289	0.3	17.6	Flood Risk
480 min Summer	0.284	0.284	0.3	17.3	Flood Risk
600 min Summer	0.278	0.278	0.3	16.9	Flood Risk
720 min Summer	0.272	0.272	0.3	16.6	Flood Risk
960 min Summer	0.260	0.260	0.3	15.8	Flood Risk
1440 min Summer	0.236	0.236	0.3	14.3	Flood Risk
2160 min Summer	0.203	0.203	0.3	12.3	Flood Risk
2880 min Summer	0.175	0.175	0.3	10.6	O K
4320 min Summer	0.131	0.131	0.3	8.0	O K
5760 min Summer	0.099	0.099	0.3	6.0	O K
7200 min Summer	0.078	0.078	0.3	4.8	O K
8640 min Summer	0.064	0.064	0.3	3.9	O K
10080 min Summer	0.055	0.055	0.3	3.3	O K
15 min Winter	0.162	0.162	0.3	9.9	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	137.200	0.0	19
30 min Summer	91.280	0.0	33
60 min Summer	58.100	0.0	64
120 min Summer	33.950	0.0	122
180 min Summer	24.762	0.0	182
240 min Summer	19.775	0.0	242
360 min Summer	14.373	0.0	360
480 min Summer	11.428	0.0	450
600 min Summer	9.554	0.0	500
720 min Summer	8.248	0.0	562
960 min Summer	6.538	0.0	684
1440 min Summer	4.702	0.0	954
2160 min Summer	3.393	0.0	1360
2880 min Summer	2.707	0.0	1756
4320 min Summer	1.993	0.0	2504
5760 min Summer	1.625	0.0	3224
7200 min Summer	1.405	0.0	3888
8640 min Summer	1.258	0.0	4576
10080 min Summer	1.155	0.0	5240
15 min Winter	137.200	0.0	19

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Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	0.214	0.214	0.3	13.0	Flood Risk
60 min Winter	0.267	0.267	0.3	16.2	Flood Risk
120 min Winter	0.300	0.300	0.3	18.3	Flood Risk
180 min Winter	0.317	0.317	0.3	19.3	Flood Risk
240 min Winter	0.326	0.326	0.3	19.8	Flood Risk
360 min Winter	0.333	0.333	0.3	20.3	Flood Risk
480 min Winter	0.331	0.331	0.3	20.1	Flood Risk
600 min Winter	0.324	0.324	0.3	19.7	Flood Risk
720 min Winter	0.315	0.315	0.3	19.2	Flood Risk
960 min Winter	0.299	0.299	0.3	18.2	Flood Risk
1440 min Winter	0.265	0.265	0.3	16.1	Flood Risk
2160 min Winter	0.216	0.216	0.3	13.1	Flood Risk
2880 min Winter	0.173	0.173	0.3	10.5	O K
4320 min Winter	0.106	0.106	0.3	6.4	O K
5760 min Winter	0.064	0.064	0.3	3.9	O K
7200 min Winter	0.048	0.048	0.3	2.9	O K
8640 min Winter	0.043	0.043	0.3	2.6	O K
10080 min Winter	0.040	0.040	0.2	2.4	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
30 min Winter	91.280	0.0	33
60 min Winter	58.100	0.0	62
120 min Winter	33.950	0.0	120
180 min Winter	24.762	0.0	178
240 min Winter	19.775	0.0	236
360 min Winter	14.373	0.0	350
480 min Winter	11.428	0.0	460
600 min Winter	9.554	0.0	566
720 min Winter	8.248	0.0	656
960 min Winter	6.538	0.0	742
1440 min Winter	4.702	0.0	1040
2160 min Winter	3.393	0.0	1472
2880 min Winter	2.707	0.0	1876
4320 min Winter	1.993	0.0	2596
5760 min Winter	1.625	0.0	3224
7200 min Winter	1.405	0.0	3744
8640 min Winter	1.258	0.0	4496
10080 min Winter	1.155	0.0	5176

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Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 473800 105650 SU 73800 05650
Data Type	Catchment
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Shortest Storm (mins)	15
Longest Storm (mins)	10080
Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.035

Time (mins) From:	To:	Area (ha)
0	4	0.035

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Model Details

Storage is Online Cover Level (m) 0.500

Cellular Storage Structure

Invert Level (m) 0.000 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.03312 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.03312

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	64.0	64.0	0.351	0.0	64.0
0.350	64.0	64.0			

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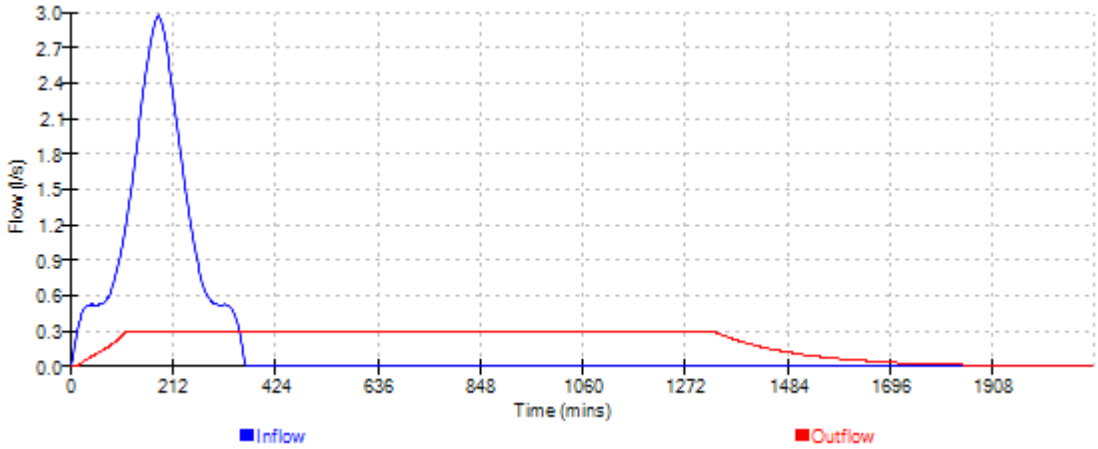
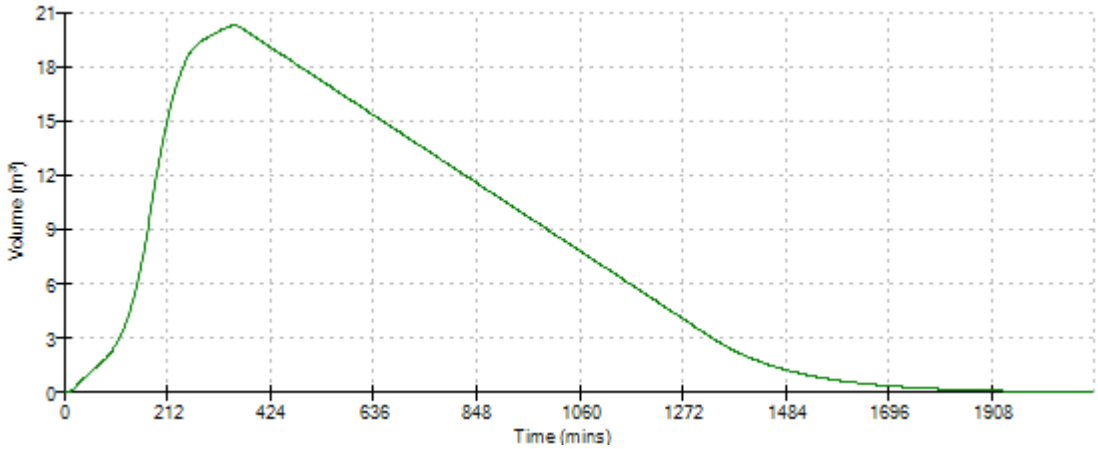
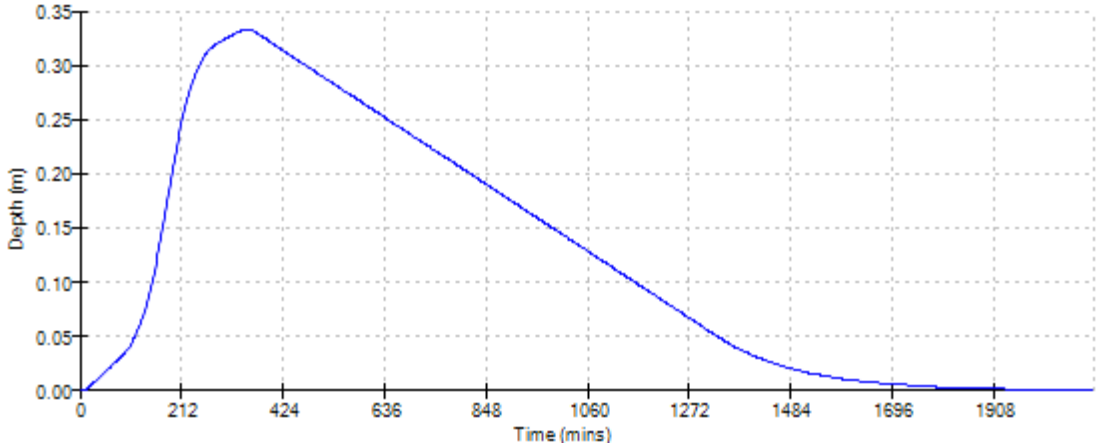
Event: 360 min Winter







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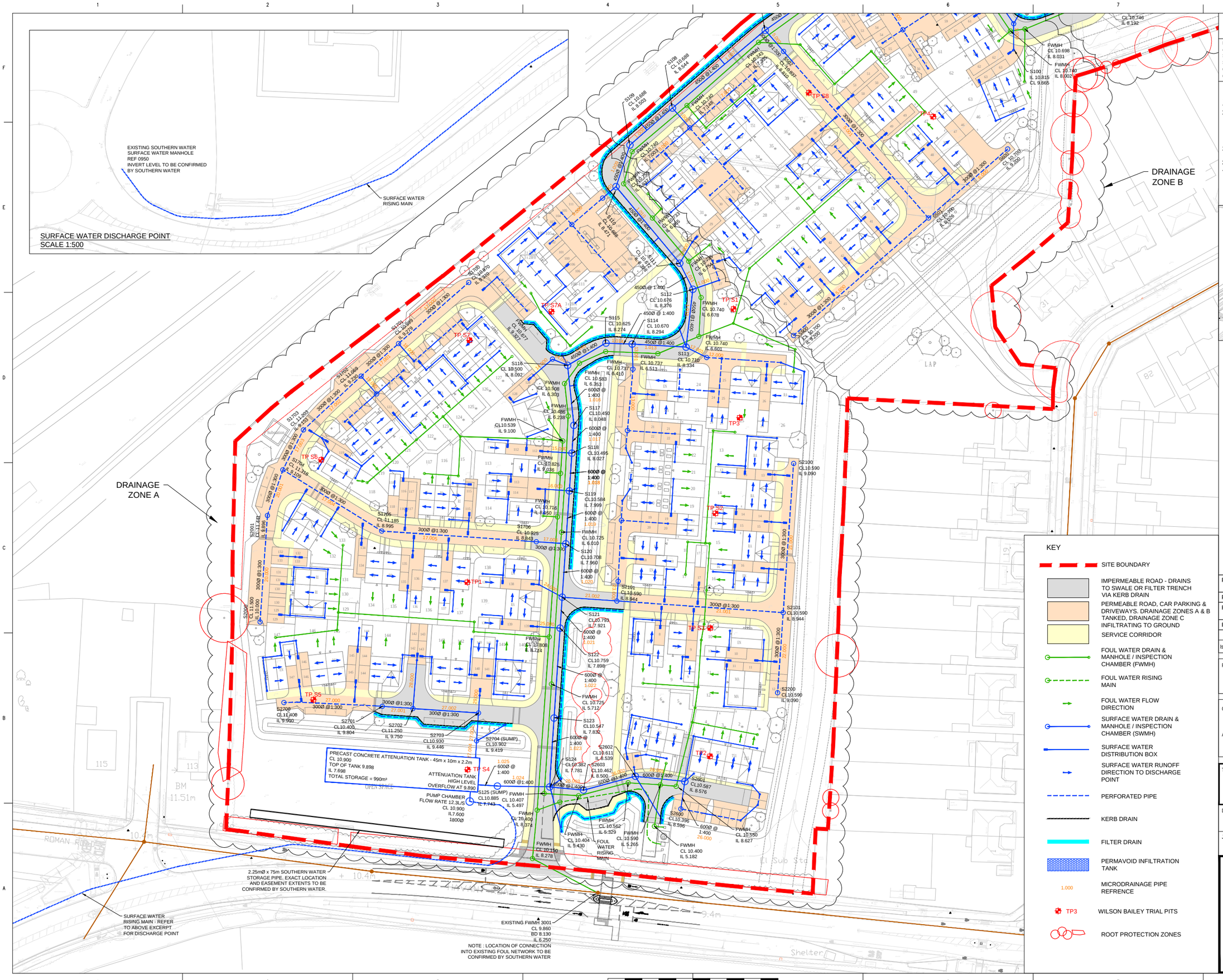
Appendix 8 – Drainage Strategy Plans

- CLXX(52)2001 Drainage Strategy Plan Sheet 1 of 2
- CLXX(52)2002 Drainage Strategy Plan Sheet 2 of 2
- CLXX(52)2003 Drainage Strategy Indicative Details



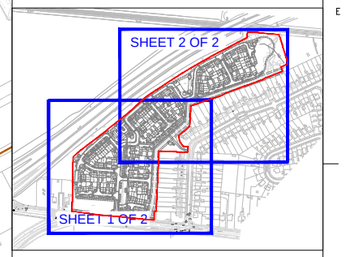
1012052 A1

Based on.

Architects Drg No.	Rev
Structural Drg No.	Rev
Survey Drg No.	Rev
Other Drg No.	Rev
Other Drg No.	Rev

Notes

1. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTURAL, STRUCTURAL AND ENGINEERING SERVICES DRAWINGS, SPECIFICATIONS, SCHEDULES AND PROJECT SPECIFIC DOCUMENTS.
2. ALL DIMENSIONS IN mm UNLESS OTHERWISE STATED.
3. DO NOT SCALE FROM THIS DRAWING.
4. REFER TO DRAWING CLXX(90)9001 FOR GENERAL CIVIL ENGINEERING NOTES.



KEY

- SITE BOUNDARY
- IMPERMEABLE ROAD - DRAINS TO SWALE OR FILTER TRENCH VIA KERB DRAIN
- PERMEABLE ROAD, CAR PARKING & DRIVEWAYS. DRAINAGE ZONES A & B TANKED, DRAINAGE ZONE C INFILTRATING TO GROUND
- SERVICE CORRIDOR
- FOUL WATER DRAIN & MANHOLE / INSPECTION CHAMBER (FWMH)
- FOUL WATER RISING MAIN
- FOUL WATER FLOW DIRECTION
- SURFACE WATER DRAIN & MANHOLE / INSPECTION CHAMBER (SWMH)
- SURFACE WATER DISTRIBUTION BOX
- SURFACE WATER RUNOFF DIRECTION TO DISCHARGE POINT
- PERFORATED PIPE
- KERB DRAIN
- FILTER DRAIN
- PERMAVOID INFILTRATION TANK
- 1.000 MICRODRAINAGE PIPE REFRENCE
- TP3 WILSON BAILEY TRIAL PITS
- ROOT PROTECTION ZONES

Issue	Date	Description	By	Chkd	Verfd
P4	04/12/17	REVISED LAYOUT - PLANNING RESUBMISSION	SJ	SP	SP
P3	19/05/17	PLANNING RESUBMISSION	SJ	AMF	AMF
P2	01/03/17	REVISED TO SUIT SCHEME ALTERATION	SJ	AMF	AMF
P1	21/07/17	ISSUED FOR PLANNING	SJ	AMF	AMF
-	14/07/16	ISSUED FOR COMMENT	SJ	AMF	AMF

Project
HAVANT ROAD, EMSWORTH

Client
BARRATT HOMES

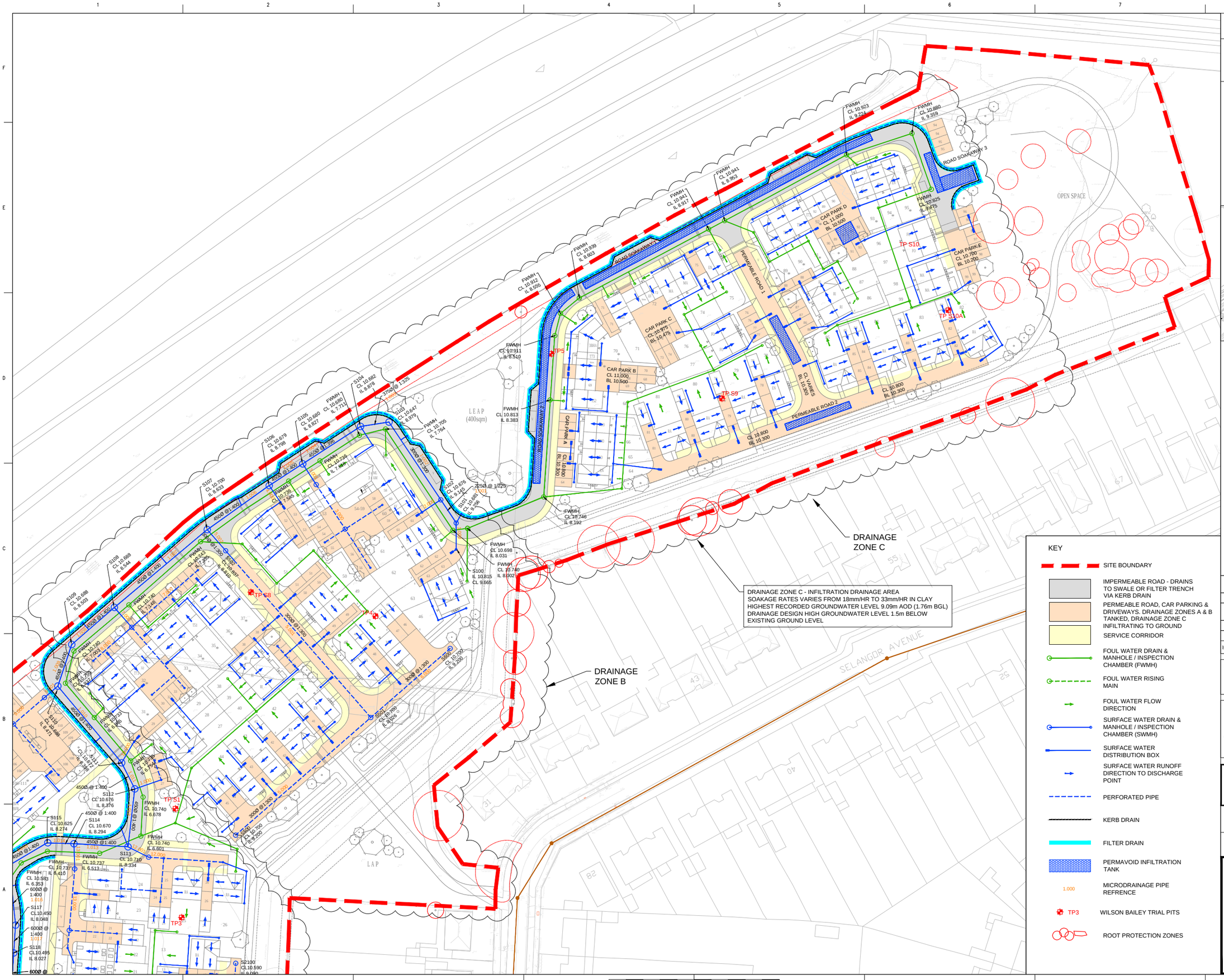
Architect
COOPER BAILLIE

Title
DRAINAGE LAYOUT
SHEET 1 OF 2

Drawing No.	Drawing Status
CLXX(52)2001	S2 - ISSUED FOR INFORMATION
Job No.	**Scale**
1012052	1:500 @ A1

CUNDALL
One Carter Lane
London, EC4V 5ER
Telephone: +44 (0)20 7438 1600
Website: www.cundall.com

True scale at 1:1



1012052 A1

Based on.

Architects Drg No.	Rev
Structural Drg No.	Rev
Survey Drg No.	Rev
Other Drg No.	Rev
Other Drg No.	Rev

Notes

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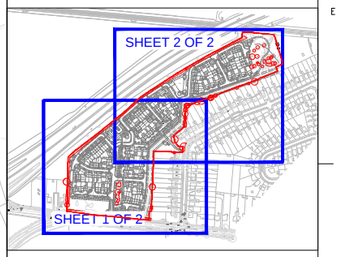

KEY

- SITE BOUNDARY
- IMPERMEABLE ROAD - DRAINS TO SWALE OR FILTER TRENCH VIA KERB DRAIN
- PERMEABLE ROAD, CAR PARKING & DRIVEWAYS. DRAINAGE ZONES A & B TANKED, DRAINAGE ZONE C INFILTRATING TO GROUND
- SERVICE CORRIDOR
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- FOUL WATER RISING MAIN
- FOUL WATER FLOW DIRECTION
- SURFACE WATER DRAIN & MANHOLE / INSPECTION CHAMBER (SWMH)
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- PERFORATED PIPE
- KERB DRAIN
- FILTER DRAIN
- PERMAVOID INFILTRATION TANK
- 1.000 MICRODRAINAGE PIPE REFRENCE
- TP3 WILSON BAILEY TRIAL PITS
- ROOT PROTECTION ZONES

Issue	Date	Description	By	Chkd	Verfd
P4	04/12/17	REVISED LAYOUT - PLANNING RESUBMISSION	SJ	SP	SP
P3	19/05/17	PLANNING RESUBMISSION	SJ	AMF	AMF
P2	01/03/17	REVISED TO SUIT SCHEME ALTERATION	SJ	AMF	AMF
P1	21/07/17	ISSUED FOR PLANNING	SJ	AMF	AMF
-	14/07/16	ISSUED FOR COMMENT	SJ	AMF	AMF

Project
HAVANT ROAD, EMSWORTH

Client
BARRATT HOMES

Architect
COOPER BAILLIE

Title
DRAINAGE LAYOUT
SHEET 2 OF 2

Drawing No.	Drawing Status
CLXX(52)2002	S2 - ISSUED FOR INFORMATION
Job No. 1012052	Scale 1:500 @ A1

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London, EC4V 5ER
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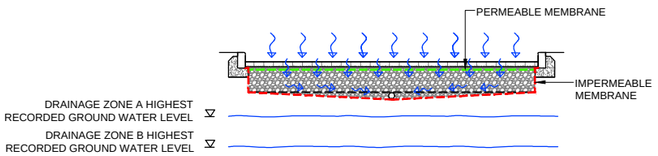
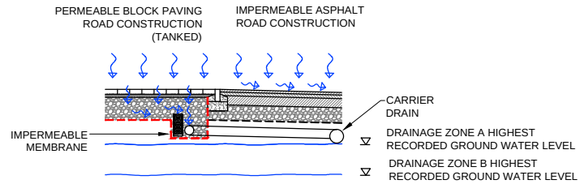
Website: www.cundall.com

True scale at 1:1



DRAINAGE ZONES A & B PERMEABLE ROAD WITH PERFORATED COLLECTOR PIPE (TANKED)

SCALE 1:50



DRAINAGE ZONE A & B PERMEABLE ROAD TO CARRIER DRAIN (TANKED)

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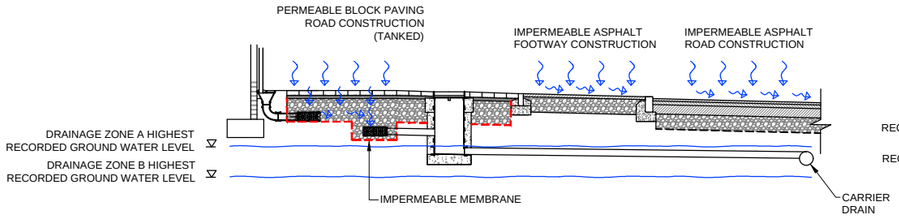

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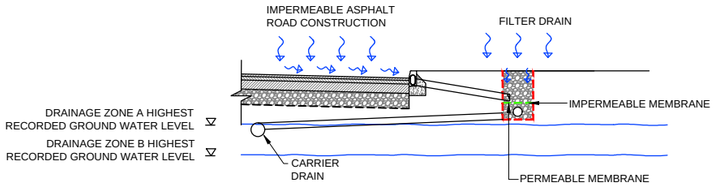

DRAINAGE ZONE A & B FILTER DRAIN TO CARRIER DRAIN (TANKED)

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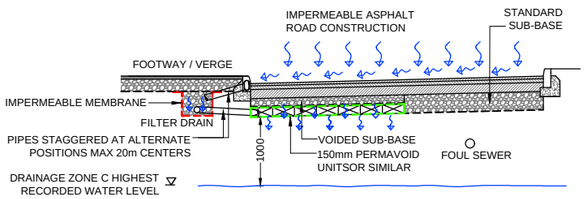

SITE ZONE C IMPERMEABLE ROAD WITH PERMAVOID (INFILTRATING)

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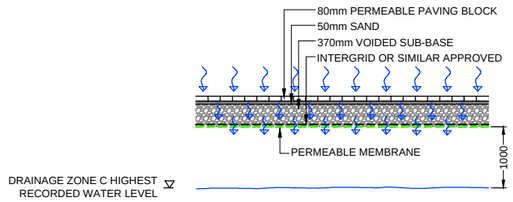
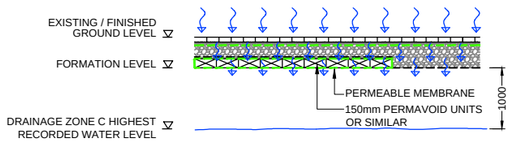


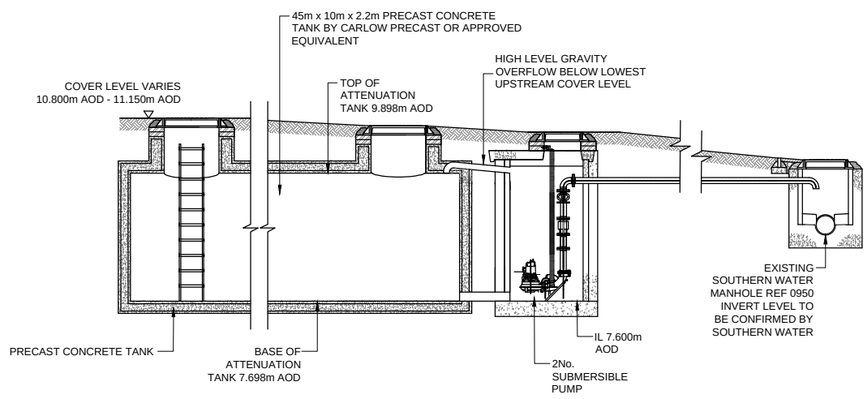
SITE ZONE C PERMEABLE PAVING IN ROADS, DRIVEWAYS & CAR PARKING AREAS (INFILTRATING)

SCALE 1:50



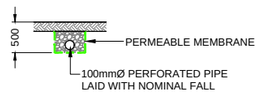
SITE ZONE C PERMEABLE PAVING / PERMAVIOD IN ROADS & CAR PARKING AREAS (INFILTRATING)

SCALE 1:50



PUMPED ATTENUATION & PUMP CHAMBER SCHEMATIC

SCALE 1:50



SITE ZONE C SURFACE WATER FILTER DRAIN FROM RWP TO PERMEABLE PAVING IN ROADS, DRIVEWAYS & CAR PARKING AREAS (INFILTRATING)

SCALE 1:50

1012052 | A1

Based on.

Architects Drg No.	Rev
Structural Drg No.	Rev
Survey Drg No.	Rev
Other Drg No.	Rev
Other Drg No.	Rev

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Notes

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Issue	Date	Description	By	Chkd	Verfd
P2	04/12/17	REVISED LAYOUT - PLANNING RESUBMISSION	SJ	SP	SP
P1	19/05/2017	PLANNING RESUBMISSION	SJ	AMF	AMF

Project
LAND AT HAVANT ROAD, EMSWORTH

Client
BDW SOUTHAMPTON

Architect
SIMON COOPER ASSOCIATES

Title
DRAINAGE STRATEGY INDICATIVE DETAILS

Drawing No.	Drawing Status
CLXX(52)2003	S2 - ISSUED FOR INFOMRATION
Job No. 1012052	Scale 1:50 @ A1

Originator	Checked	Verified	Issue.
SJ	AMF	AMF	P2

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Appendix 9 – Southern Water Correspondence

a

a

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