ODYSSEY

CELEBRATING 15 YEARS

FORD LANE, YAPTON

DRAINAGE STATEMENT

ARUN DISTRICT COUNCIL Y/26/21/DOC

PROPOSED DEVELOPMENT AT FORD LANE, YAPTON

DRAINAGE STATEMENT
ON BEHALF OF CLIENT

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February 2021

ARUN DISTRICT COUNCIL Y/26/21/DOC

DOCUMENT CONTROL SHEET

Project Name Ford Lane, Yapton

Project No. 18-344

Rev	Issue Purpose	Author	Checked	Reviewed	Approved	Date
	Planning	SG	LH	SG	LH	15.01.2020
A	Updated Site Layout	SG	LH	SG	LH	16.09.2020
B	Updated Site Layout	SG	LH	SG	LH	09.10.2020
C	Drawings Updated	SG	LH	SG	LH	16.10.2020
D	Drawings Updated	SG	RS	SG	RS	29.10.2020
E	Drawings Updated	SG	LH	SG	LH	27.01.2021
F	Updated to suit Client comments	SG	LH	SG	LH	28.01.2021
G	Drawings Updated	SG	LH	SG	LH	29.01.2021
H	Updated to suit Arun DC comments	SG	LH	SG	LH	18.02.2021

CONTENTS

1.0 INTRODUCTION 1

2.0 EXISTING SITE 2

3.0 PROPOSED DRAINAGE 3

4.0 TREATMENT OF SURFACE WATER RUN-OFF 6

5.0 OVERLAND FLOW ROUTES AND EXCEEDANCE ROUTES 7

6.0 CONCLUSION 8

APPENDICES

Appendix A Odyssey Drawings 18-344/800-802 (Engineering Layouts)

Appendix B Odyssey Drawings 18-344/821, 823 – 825, 836 (Construction Details)

Appendix C Odyssey Drawing 18-344/108 (Surface Water Catchment and Implementation Plan)

Appendix D Odyssey Drawing 18-344/107 (Overland Flow Routes)

Appendix E Odyssey Drawing 18-344/110 (Winter Groundwater and Infiltration Data Plan)

Appendix F Odyssey Drawing 18-344/113 (Basin Sections)

Appendix G Windes Calculations

Appendix H Arun DC Surface Water Checklist

1.0 INTRODUCTION

1.1.1 Odyssey has been commissioned by Redrow Homes to prepare this drainage report in support of their Reserved Matters (RM) application for the residential development at Ford Lane, Yapton. This follows the grant of outline planning permission on 15th January 2019 (Ref: Y/80/16/OUT). This report also sets out the background, existing drainage regime, proposed drainage regime, overland flow routes and maintenance of SuDS features.

1.1.2 The description of the development at the outline application was:

"Outline application with some matters reserved for 4.5 hectares of residential development comprising 3.4 hectares of land for up to 100 dwellings (up to 30 (30%) affordable housing) together with 1.1 hectares of land set aside for public open space and strategic landscaping and 2.2 hectares of public open space and green corridors with vehicular access from Ford Lane and pedestrian/cycle access only from North End Road."

ARUN DISTRICT COUNCIL Y/26/21/DOC

2.0 EXISTING SITE

2.1.1 The proposed development site comprises 6.7ha of greenfield land and is located off Ford Lane to the north east of Yapton Village in West Sussex. The site is surrounded by arable land to the north and east, Orchard Business Park and residential dwellings to the south and North End Road to the west.

2.1.2 The topographical survey shows the site to be relatively flat with one half of the site falling from north to west and the other falling from north to south. Levels range from approximately 8.24m AOD in the north to 6.46m AOD in the west.

2.1.3 It is understood that there are no public surface water sewers in close proximity to the site and the existing drainage regime relies on surface water infiltrating through the underlying strata.

2.1.4 An intrusive ground investigation was conducted by Eastwood & Partners in October 2019. A total of 5 No. sample pits were excavated up to a maximum depth of 4m bgl across the development site to allow for the installation of groundwater monitoring wells. The findings in their report indicate that the existing geology consists predominantly of river terrace sands and clays underlain by the chalk.

2.1.5 In accordance with the Arun DC requirements, ten rounds of groundwater monitoring were completed during the winter period (October to March inclusive) and groundwater was encountered at depths ranging between 2.79 – 6.57m bgl.

2.1.6 In January 2020, infiltration testing was also completed at 5 locations across the site. Each location underwent two tests, one shallow and one deep. The shallow tests had a base depth of around 1m and the deeper tests around 3m. Results from the testing identified rates that ranged from 5.50 x 10-6m/s and 0.13 x 10-6m/s.

2.1.7 It is also understood that there are no foul water sewers present within the site. The nearest public foul water sewer is located in North End Road and currently serves existing residential dwellings in the surrounding area.

ARUN DISTRICT COUNCIL Y/26/21/DOC

3.0 PROPOSED DRAINAGE

3.1.1 New foul and surface water drainage networks are proposed across the development site. The proposed foul and surface water drainage designs are shown on Odyssey **Drawings 18-344/800-802** provided with this report in **Appendix A**.

3.2 Design Criteria

3.2.1 The design criteria applied for the proposed drainage are as follows:

- Pipework beneath existing and proposed highways is to have cover of at least 1.2m where possible
- Private foul and surface water drainage is to be in accordance with Approved Document H of the Building Regulations
- Adoptable drainage is to be in accordance with Sewers for Adoption
- 10% urban creep has been allowed for the dwellings' hard standing areas (roofs and garages)

3.3 Surface Water Drainage

3.3.1 The proposed surface water scheme has been designed in accordance with the strategy set out in the Flood Risk Assessment (FRA) submitted as part of outline planning application for the site. The FRA proposes the use of sustainable drainage techniques to control the surface water from the development.

3.3.2 Based on the testing undertaken by Eastwood & Partners, the infiltration potential varies across the site for both shallow (1m) and deep (3m) tests/rates. The design is to infiltrate surface water run-off for the whole development from roads, roofs, parking bays and parking courts into the existing strata either with shallow systems or at depth depending on the infiltration rates in the associated infiltration areas.

3.3.3 The site is split into various catchment areas and infiltration rates as shown on **drawing 18-344/108** in **Appendix D** and **drawing 18-344/110** in **Appendix E**. Principally, the west part of the site drains into permeable paved drives/roads or courtyards, the central/northern areas into permeable paved drives/roads or cellular soakaways, the eastern side into permeable paved drives/roads and rear garden soakaways, with some perimeter visitor parking to a boundary swale via gullies. The southern area drains to permeable drives or rear garden soakaways with a small hard paved area/catchment draining via kerb drains to the basin in the open space.

ARUN DISTRICT COUNCIL Y/26/21/DOC

3.3.4 The surface water drainage systems have been designed to accommodate all rainfall events up to 1 in 100-year event plus climate change (+40%) with no flooding. Due to some lower/slower inflation rates and extended drain times additional capacity has been added into the drainage storage/systems to allow for further storms over and above the 1 in 100 year + CC. Supporting calculations can be found within **Appendix G**. The remaining depth in the structures above the highest storms/water level shows the extra over capacity provided/available.

3.3.5 At the request of Arun District Council, Odyssey has undertaken drainage calculations to test the system under the conditions of a modelled 1 in 10-year flood event plus climate change event. Sample worst case assessments have been provided in **Appendix G**.

3.3.6 Surface water treatment would be provided by the permeable paving via both the grit layer and geotextile that the blocks are bedded on, as well as the underlying gravel media comprising of washed no fines material. These measures provide filtration and the breakdown of hydrocarbons as the water is conveyed through the system and into the piped network.

3.3.7 The swales and basin are open features which offer some treatment and attenuation locally and provide a softer and aesthetic/enhanced landscape to those areas.

3.4 Maintenance and Management Plan

3.4.1 The details for the maintenance and management of the surface water network and SuDS features is covered under a separate report (Odyssey Report reference **18-344-13 Management & Maintenance Manual**). The surface water features/systems for the whole site will be kept private and maintained by a maintenance and management company.

3.5 Urban Creep

3.5.1 The CIRIA SuDS Manual states that urban creep is defined as any increase in the impervious area that is drained to an existing drainage system without planning permission being required, and therefore without any consideration of whether the capacity of the receiving sewer system can accommodate the increased flow. An increase of 10% has been applied to areas which may be subject to urban creep to allow for future urban expansion on a local scale.

3.6 Foul Drainage

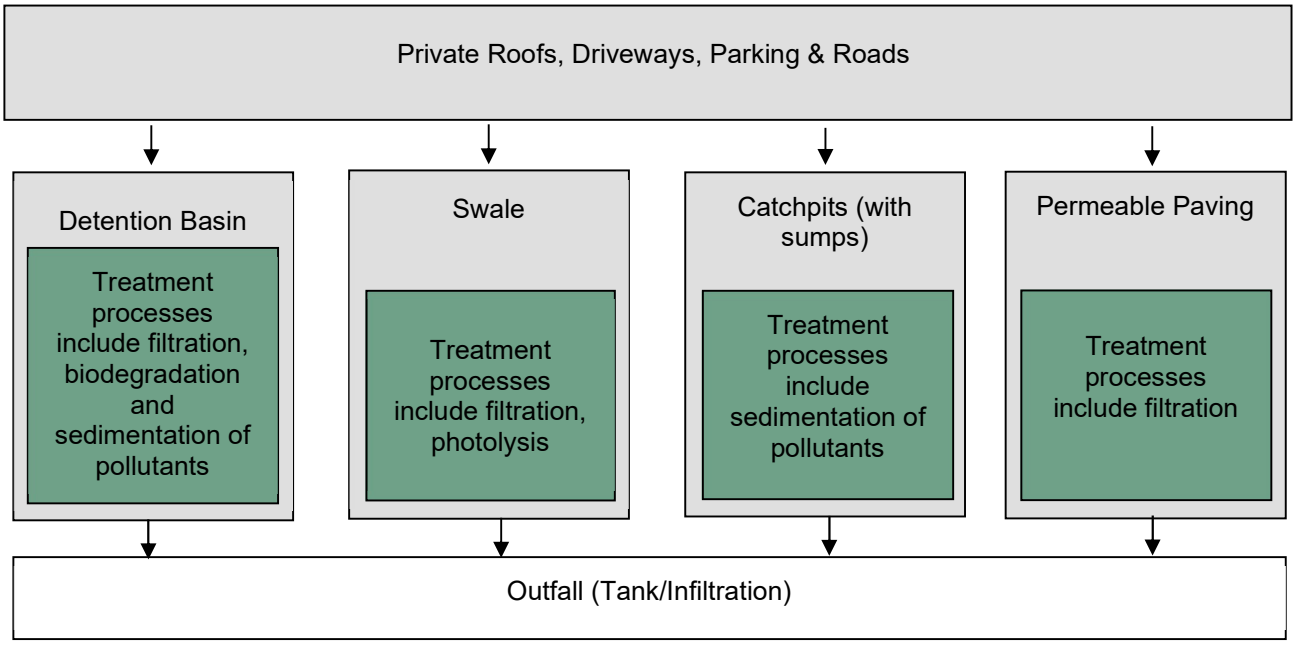
3.6.1 The proposed foul water drainage design utilises a combination of gravity and pumped systems.

3.6.2 It is proposed that foul flows from the development will be conveyed and discharged into the existing Southern Water sewer located in the North End Road via a new manhole.

3.6.3 Due to the existing topography of the site, foul flows from a number of dwellings to the east would be conveyed to a Southern Water adopted pumping station located towards the south of the site before being pumped north via a rising main into the main network.

4.0 TREATMENT OF SURFACE WATER RUN-OFF

4.1.1 Surface water will be subject to the following treatment train prior to infiltration. The levels of proposed treatment are shown below.



5.0 OVERLAND FLOW ROUTES AND EXCEEDANCE ROUTES

5.1.1 The calculations provided in **Appendix G** show there to be no flooding for storm events up to and including the 1 in 100 year event plus 40% climate change.

5.1.2 Overland flow routes have been shown on Odyssey **drawing 18-344/107**, which is supplied in **Appendix D**.

5.1.3 As an extra over provision, a bund has been proposed at the southern end of the site. This will allow for any overland flow to be contained within the open space area and channelled to the east. The full extent of this can be seen on Odyssey **drawing 18-344/802** in **Appendix A.**

6.0 CONCLUSION

6.1.1 The surface water drainage scheme for this site proposes a mixture of piped/cellular storage systems, permeable paving and open features ultimately leading to discharge/disposing of surface water via infiltration into the existing ground below.

6.1.2 Treatment is provided in the form of silt traps/sumps, permeable paved roads/drives, swales and a basin.

6.1.3 All system/features are design to accommodate the 100 year event + 40% climate change with some spare capacity over and above this.

6.1.4 The surface water systems/features will be kept private and maintained by a private management company.

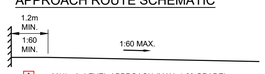
6.1.5 The foul will discharge via gravity and an onsite pumping station/rising main to the existing Southern Water sewer in North End Road.

APPENDIX A

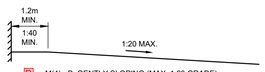
Odyssey Drawings 18-344/800-802

Engineering Layouts

THE BUILDING REGULATIONS: PART M APPROACH ROUTE SCHEMATIC



A M(4) - A: LEVEL APPROACH (MAX. 1:60 GRADE)



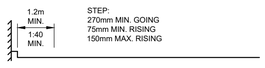
B M(4) - B: GENTLY SLOPING (MAX. 1:20 GRADE)

C M(4) - C: RAMPED APPROACH (MAX. 1:12 OR 1:15 GRADE)

STEPS:
280mm MIN. GOING
75mm MIN. RISING
150mm MAX. RISING
12 No. STEPS MAX WITHOUT INTERMEDIATE 900mm MIN. LEVEL LANDING
3 No. STEPS OR MORE REQUIRE HANDRAIL

HANDRAIL:
850mm MIN. HEIGHT
1000mm MAX. HEIGHT
300mm EXTENSION BEYOND TOP AND BOTTOM NOSINGS

D M(4) - D: STEPPED APPROACH



STEP:
270mm MIN. GOING
75mm MIN. RISING
150mm MAX. RISING

E M(4) - E: SINGLE STEP AT THRESHOLD

N

NOTES

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELATED DRAWINGS ISSUED BY THE ARCHITECT AND ENGINEER, SEWERS FOR ADOPTION SIXTH/SEVENTH EDITION, WEST SUSSEX COUNTY COUNCIL STANDARDS AND BOVIS HOMES STANDARDS.
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6. CONTOURS SHOWN ON THIS DRAWING ARE AT 20mm VERTICAL INTERVALS.
7. THIS DRAWING IS BASED ON THE PLANNING LAYOUT PROVIDED BY GEOFF PERRY ASSOCIATES. DRAWING REFERENCE A855_65A_.
8. TOPOGRAPHICAL SURVEY WAS UNDERTAKEN BY MK SURVEYS IN OCTOBER 2019.
9. WATERPROOFING TO BE INSTALLED IN ACCORDANCE WITH NHBC CHAPTER 5.4 BY SUPPLIER/CONTRACTOR FROM DPC DOWNWARDS INCLUDING STEPPED FLOORS MORE THAN 150mm. RAISED DPC SHOWN ON THIS DRAWING IS IN AREAS WHERE FINISHED GROUND LEVEL IS LESS THAN 150mm BELOW FFL. EXPOSED BRIICKWORK/UNDERBUILD HAS BEEN INDICATED WHERE EXTERNAL LEVELS ARE GREATER THAN 150mm BELOW FFL.
10. PRIVATE FOUL WATER AND SURFACE WATER DRAINAGE IS TO BE CONSTRUCTED IN ACCORDANCE WITH THE BUILDING REGULATIONS, BS EN 752, NHBC STANDARDS CHAPTER 5.3 AND RELEVANT AGREEMENT CERTIFICATES.
11. PRIVATE DRAINS TO BE CONSTRUCTED USING UPVC BUILDING DRAINAGE SYSTEM PIPEWORK TO BS EN 1401, BEDDED AND BACKFILLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS AND THE SPECIFICATIONS LISTED IN NOTE 1.
12. INSPECTION CHAMBER SIZES ARE TO BE IN ACCORDANCE WITH THE BUILDING REGULATIONS PART H; TABLE 11 AND MANHOLE SIZES TABLE.
13. BACKFILLING OF DRAIN TRENCHES ADJACENT TO DWELLINGS OF OTHER STRUCTURES TO BE IN ACCORDANCE WITH THE BUILDING REGULATIONS PART H; DIAGRAM 8.
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19. ALL RWP'S TO HAVE RODDING ACCESS.
20. ALL FOUL AND SURFACE WATER DRAINAGE PIPES WITHIN PRIVATE AREAS TO BE 100mm Ø UNLESS SPECIFIED OTHERWISE.
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22. FIRST FOUL SEWER INSPECTION CHAMBERS TO BE 750mm DEEP UNLESS SPECIFIED OTHERWISE.
23. IN COMPLIANCE WITH CDM 2015 ODYSSEY HAS FOLLOWED IT'S DESIGN RISK MANAGEMENT PROCESS FOR HAZARD ELIMINATION AND RISK REDUCTION IN DEVELOPING THE ODYSSEY DESIGNS SHOWN ON THIS DRAWING. THERE ARE NO ABNORMAL OR UNUSUAL RESIDUAL RISKS ASSOCIATED WITH THE DESIGN. ANY OTHER RESIDUAL RISKS ARE THOSE THAT WOULD NORMALLY BE EXPECTED BY COMPETENT PERSONS OR CONTRACTORS ENGAGED ON WORK OF THIS NATURE OR TYPE.
24. FOUL DRAINAGE SUBJECT TO TECHNICAL APPROVAL FROM SOUTHERN WATER.
25. GEOTECHNICAL ENGINEER TO CONFIRM SOAKAWAY OFFSETS FROM BUILDINGS.
26. ALL DRAINAGE CONNECTIONS DIRECTLY TO SEWERS TO BE MADE VIA OBLIQUE 45° JUNCTIONS.

LEGEND

- DEVELOPMENT BOUNDARY
- HIGHWAY BOUNDARY
- FFL 8.325 — PROPOSED FINISHED FLOOR LEVEL (mAOD)
- FGL 8.325 — PROPOSED FINISHED GARAGE LEVEL (mAOD)
- ×Ex. (7.000) — EXISTING LEVEL (mAOD)
- × 7.000 — PROPOSED LEVEL (mAOD)
- × SBIL: 6.975 — PROPOSED PERMEABLE PAVING SUB-BASE INVERT LEVELS
- 700mm DEEP PERMEABLE PAVING — MAIN ROAD CONSTRUCTION DEPTHS (WHERE SBIL ARE NOT SHOWN DEPTHS ARE BASED ON FULL CONSTRUCTION DEPTH)
- 1:40 — PROPOSED GRADIENT
- 7.500 — PROPOSED CONTOURS (SEE NOTE 6)
- PROPOSED RETAINING WALL
- PROPOSED CONCRETE GRAVEL BOARD
- RAISED DPC/TANKING
- EXPOSED BRICKWORK/UNDERBUILD
- HIGHWAY DRAIN AND MANHOLE
- ADOPTABLE FOUL WATER SEWER AND MANHOLE
- EXISTING FOUL WATER SEWER
- PRIVATE SURFACE WATER SEWER AND MANHOLE
- TYPE B SURFACE WATER CATCHPIT. (REFER TO WSCC STANDARD DETAIL S278/S38/13)
- HYDRO-BRAKE FLOW CONTROL CHAMBER. (REFER TO ODYSSEY DRAWING 18-344/836 FOR DETAILS)
- PRIVATE FOUL DRAIN
- PRIVATE SURACE WATER DRAIN
- TYPE 3 FOUL INSPECTION CHAMBER (REFER TO ODYSSEY DRAWING 18-344/824 FOR DETAILS)
- TYPE 3 SURFACE WATER INSPECTION CHAMBER (REFER TO ODYSSEY DRAWING 18-344/824 FOR DETAILS)
- RODDING EYE (REFER TO ODYSSEY DRAWING 18-344/824 FOR DETAILS)
- CATCHPIT INSPECTION CHAMBER (REFER TO ODYSSEY DRAWING 18-344/825 FOR DETAILS)
- DIFFUSER UNIT (REFER TO ODYSSEY DRAWING 18-344/825 FOR DETAILS)
- FILTER DRAIN (REFER TO ODYSSEY DRAWING 18-344/821 FOR DETAILS)
- ACO DRAIN (REFER TO ODYSSEY DRAWING 18-344/824 FOR DETAILS)
- ROAD GULLY AND CONNECTION (REFER TO WSCC STANDARD DETAIL S278/38/11)
- PROPOSED CELLULAR STORAGE TANK (REFER TO ODYSSEY DRAWING 18-344/825)
- PROPOSED PERMEABLE BLOCK PAVING (REFER TO ODYSSEY DRAWING 18-344/821)
- INDICATIVE SERVICE CORRIDOR
- CHECK DAM (REFER TO ODYSSEY DRAWING 18-344/825)
- FOUL WATER RISING MAIN
- TREE ROOT PROTECTION ZONES
- PROPOSED STREET LIGHTING PROVIDED BY MMA

FOR CONTINUATION SEE DRAWING NUMBER 18-344/800

TENDER ISSUE

KEY PLAN

Rev	Amendments	Dm	Chk	App	Date
F	UPDATED TO SUIT ARUN DC COMMENTS	SOM	SG	LH	22.02.21
E	UPDATED TO SUIT CLIENT COMMENTS	SOM	SG	LH	29.01.21
D	UPDATED TO SUIT CLIENT COMMENTS	SOM	SG	LH	27.01.21
C	UPDATED TO SUIT CLIENT COMMENTS	JA	SG	RM	28.10.20
B	UPDATED TO SUIT REVISED SITE LAYOUT	JA	SG	LH	09.10.20
A	UPDATED TENDER ISSUE	JA	SG	LH	27.08.20

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E: info@odysseyconsult.co.uk
W: www.odysseyconsult.co.uk

Job Title: FORD LANE, YAPTON

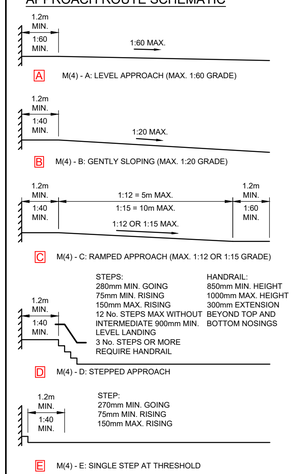
Drawing Title: ENGINEERING LAYOUT SHEET 1 OF 3

Client: REDROW

Scale	Date	Designed
1:250 @A0	FEB 2020	JA
Drawn	Checked	Approved
JA	SG	LH
Job No	Drawing No	Rev
18-344	18-344/800	F

P:\18-344 - Ford Lane, Yapton\Tech\Acad\Drawings\800 Series (Detailed Design)\18-344-800 Engineering Layout Sheet 1 of 3.dwg

THE BUILDING REGULATIONS: PART M APPROACH ROUTE SCHEMATIC



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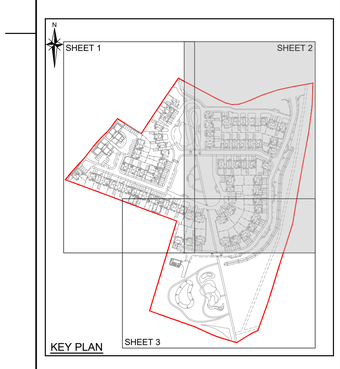
- PROPOSED RETAINING WALL
- PROPOSED CONCRETE GRAVEL BOARD
- RAISED DPC/TANKING
- EXPOSED BRICKWORK/UNDERBUILD
- HIGHWAY DRAIN AND MANHOLE
- ADOPTABLE FOUL WATER SEWER AND MANHOLE
- EXISTING FOUL WATER SEWER
- PRIVATE SURFACE WATER SEWER AND MANHOLE
- TYPE B SURFACE WATER CATCHPIT. (REFER TO WSCC STANDARD DETAIL S278/S38/13)
- HYDRO-BRAKE FLOW CONTROL CHAMBER. (REFER TO ODYSSEY DRAWING 18-344/836 FOR DETAILS)
- PRIVATE FOUL DRAIN
- PRIVATE SURACE WATER DRAIN
- TYPE 3 FOUL INSPECTION CHAMBER (REFER TO ODYSSEY DRAWING 18-344/824 FOR DETAILS)
- TYPE 3 SURFACE WATER INSPECTION CHAMBER (REFER TO ODYSSEY DRAWING 18-344/824 FOR DETAILS)
- RODDING EYE (REFER TO ODYSSEY DRAWING 18-344/824 FOR DETAILS)
- CATCHPIT INSPECTION CHAMBER (REFER TO ODYSSEY DRAWING 18-344/825 FOR DETAILS)
- DIFFUSER UNIT (REFER TO ODYSSEY DRAWING 18-344/825 FOR DETAILS)
- FILTER DRAIN (REFER TO ODYSSEY DRAWING 18-344/821 FOR DETAILS)
- ACO DRAIN (REFER TO ODYSSEY DRAWING 18-344/824 FOR DETAILS)
- ROAD GULLY AND CONNECTION (REFER TO WSCC STANDARD DETAIL S278/38/11)
- PROPOSED CELLULAR STORAGE TANK (REFER TO ODYSSEY DRAWING 18-344/825)
- PROPOSED PERMEABLE BLOCK PAVING (REFER TO ODYSSEY DRAWING 18-344/821)
- INDICATIVE SERVICE CORRIDOR
- CHECK DAM (REFER TO ODYSSEY DRAWING 18-344/825)
- FOUL WATER RISING MAIN
- TREE ROOT PROTECTION ZONES
- PROPOSED STREET LIGHTING PROVIDED BY MMA
- 600mm DEEP INFILTRATION SWALE WITH 1 IN 3 SIDE SLOPES AND 1m WIDE BASE.
- BAGWORK HEADWALL. REFER TO WSCC DETAIL S278/S38/23 FOR DETAIL

TENDER ISSUE



Rev	Amendments	Drn	Chk	App	Date
J	UPDATED TO SUIT ARUN DC COMMENTS	SOM	SG	LH	22.02.21
H	UPDATED TO SUIT CLIENT COMMENTS	SOM	SG	LH	29.01.21
G	UPDATED TO SUIT CLIENT COMMENTS	SOM	SG	LH	27.01.21
F	UPDATED TO SUIT CLIENT COMMENTS	JA	SG	RM	28.10.20
E	UPDATED TO SUIT CLIENT COMMENTS	JA	SG	RM	16.10.20
D	UPDATED TO SUIT REVISED SITE LAYOUT	JA	SG	LH	09.10.20
C	PLOT 7 PATIO ADDED.	JA	LH	LH	07.09.20
B	PLOT 7 UPDATED.	JA	LH	LH	03.09.20
A	UPDATED TENDER ISSUE	JA	SG	LH	27.08.20

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Job Title: FORD LANE, YAPTON

Drawing Title: ENGINEERING LAYOUT SHEET 2 OF 3

Client: REDROW

Scale	Date	Designed
1:250 @A0	FEB 2020	JA
Drawn	Checked	Approved
JA	SG	LH
Job No	Drawing No	Rev
18-344	18-344/801	J

P:\18-344 - Ford Lane, Yapton\Tech\Acad\Drawings\800 Series (Detailed Design)\18-344-801 Engineering Layout Sheet 2 of 3.dwg

ARUN DISTRICT COUNCIL Y/26/21/DOC

100mmØ PIPE FOR LINKED OVERFLOW CAST INTO CHECK DAM DETAIL AS PER DRAWING 18-344/820 IL: 7.500

HYDROBRAKE WITH A MAXIMUM ALLOWABLE DISCHARGE RATE OF 0.7 l/s

100mmØ PIPE FOR OVERFLOW. IL: 7.470

FOR CONTINUATION SEE DRAWING NUMBER 18-344/801

FOR CONTINUATION SEE DRAWING NUMBER 18-344/800

FOR CONTINUATION SEE DRAWING NUMBER 18-344/801

F9 CL: 7.441 IL: 4.201

F10 CL: 7.603 IL: 4.053

F11 CL: 7.730 IL: 3.922

NON RETURN VALVE

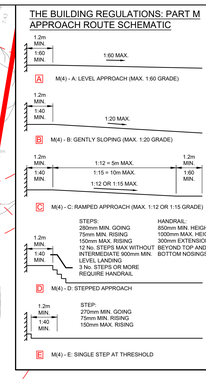
INFILTRATION BASIN
COVER LEVEL: 7.500
PLAN AREA: 909m²
BASE AREA: 290m²
BASIN DEPTH: 1.4m
BASIN INVERT LEVEL: 6.100
SLOPES: 1 in 4

CELLULAR STORAGE TANK BENEATH SURFACE OF PERMEABLE PAVING 4 x 8 x 0.4m DEEP BASE IL: 6.400 PIPE IL: 6.600

LEVEL/BUND IN THIS AREA TO BE MANIPULATED TO ENCOURAGE OVERLAND FLOWS TO FALL TO THE EAST

PROPOSED BUND WITH 1 IN 3 SIDE SLOPES. HEIGHT VARIES

THE BUILDING REGULATIONS: PART M APPROACH ROUTE SCHEMATIC



NOTES

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELATED DRAWINGS ISSUED BY THE ARCHITECT AND ENGINEER. SEWERS FOR ADOPTION SIXTH/SEVENTH EDITION, WEST SUSSEX COUNTY COUNCIL STANDARDS AND BOVIS HOMES STANDARDS.
2. DO NOT SCALE FROM THIS DRAWING. WORK FROM FIGURED DIMENSIONS ONLY.
3. ALL DIMENSIONS SHOWN IN METRES UNLESS NOTED OTHERWISE.
4. ALL DIMENSIONS, LEVELS AND SURVEY GRID CO-ORDINATES ARE TO BE CHECKED ONSITE AND THE ENGINEER NOTIFIED IMMEDIATELY OF ANY DISCREPANCIES PRIOR TO THE COMMENCEMENT OF THE WORKS.
5. NO DEVIATION FROM THE DETAILS SHOWN ON THIS DRAWING IS PERMITTED WITHOUT PERMISSION FROM THE ENGINEER.
6. CONTOURS SHOWN ON THIS DRAWING ARE AT 20mm VERTICAL INTERVALS.
7. THIS DRAWING IS BASED ON THE PLANNING LAYOUT PROVIDED BY GEOFF PERRY ASSOCIATES. DRAWING REFERENCE A855_42A .
8. TOPOGRAPHICAL SURVEY WAS UNDERTAKEN BY MK SURVEYS IN OCTOBER '19'.
9. WATERPROOFING TO BE INSTALLED IN ACCORDANCE WITH NHBC CHAPTER 5.4 BY SUPPLIER/CONTRACTOR FROM DPC DOWNWARDS INCLUDING STEPPED FLOORS MORE THAN 150mm. RAISED DPC SHOWN ON THIS DRAWING IS IN AREAS WHERE FINISHED GROUND LEVEL IS LESS THAN 150mm BELOW FFL. EXPOSED BRICKWORK/UNDERBUILD HAS BEEN INDICATED WHERE EXTERNAL LEVELS ARE GREATER THAN 150mm BELOW FFL.
10. PRIVATE FOUL WATER AND SURFACE WATER DRAINAGE IS TO BE CONSTRUCTED IN ACCORDANCE WITH THE BUILDING REGULATIONS, BS EN 752, NHBC STANDARDS CHAPTER 5.3 AND RELEVANT AGREEMENT CERTIFICATES.
11. PRIVATE DRAINS TO BE CONSTRUCTED USING UPVC BUILDING DRAINAGE SYSTEM PIPEWORK TO BS EN 1401, BEDDED AND BACKFILLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS AND THE SPECIFICATIONS LISTED IN NOTE 1
12. INSPECTION CHAMBER SIZES ARE TO BE IN ACCORDANCE WITH THE BUILDING REGULATIONS PART H, TABLE 11 AND MANHOLE SIZES TABLE.
13. BACKFILLING OF DRAIN TRENCHES ADJACENT TO DWELLINGS OF OTHER STRUCTURES TO BE IN ACCORDANCE WITH THE BUILDING REGULATIONS PART H, DIAGRAM 8.
14. INSPECTION CHAMBER COVERS IN PRIVATE AREAS SHOULD BE GROUP 1 CLASS A15 IN PEDESTRIAN AREAS INACCESSIBLE TO WHEELED VEHICLES AND GROUP 4 CLASS D400 IN VEHICULAR AREAS.
15. ALL SOIL VENT PIPE, STUB STACKS, AIR ADMITTANCE VALVES AND RAIN WATER PIPE LOCATIONS ARE INDICATIVE ONLY. FOR ACTUAL LOCATIONS REFER TO ARCHITECTURAL PLANS AND ELEVATIONS.
16. SURFACE WATER FROM PRIVATE AREAS IS NOT TO BE DISCHARGED ONTO PROPOSED HIGHWAY.
17. DRAINS TO BE CONSTRUCTED UNDER DWELLINGS WITH SUSPENDED FLOOR SLABS SHOULD EITHER BE INSTALLED USING A PROPRIETARY HANGER SYSTEM WHERE "BEAM AND POT" OR SIMILAR CONSTRUCTION IS USED, OR SHOULD BE CAST INTO LOCAL SLAB THICKENING WHERE REINFORCED CONCRETE GROUND SLABS ARE TO BE POURED IN SITU.
18. DRAINS IN AREAS OF MADE GROUND TO BE CONSTRUCTED BY FIRST MAKING UP THE AREA TO APPROXIMATELY FINISHED LEVEL AND THEN EXCAVATE THROUGH THE FILL MATERIAL INTO UNDISTURBED GROUND. THE DRAIN TRENCH IS THEN TO BE BACKFILLED TO FORMATION LEVEL USING SUITABLE GRANULAR FILL MATERIAL WELL COMPACTED IN LAYERS NOT EXCEEDING 225 THICK.
19. ALL RWP'S TO HAVE RODDING ACCESS.
20. ALL FOUL AND SURFACE WATER DRAINAGE PIPES WITHIN PRIVATE AREAS TO BE 100mm Ø UNLESS SPECIFIED OTHERWISE.
21. FIRST SURFACE WATER INSPECTION CHAMBERS TO BE 600mm DEEP UNLESS SPECIFIED OTHERWISE.
22. FIRST FOUL SEWER INSPECTION CHAMBERS TO BE 750mm DEEP UNLESS SPECIFIED OTHERWISE.
23. IN COMPLIANCE WITH CDM 2015 ODYSSEY HAS FOLLOWED IT'S DESIGN RISK MANAGEMENT PROCESS FOR HAZARD ELIMINATION AND RISK REDUCTION IN DEVELOPING THE ODYSSEY DESIGNS SHOWN ON THIS DRAWING. THERE ARE NO ABNORMAL OR UNUSUAL RESIDUAL RISKS ASSOCIATED WITH THE DESIGN. ANY OTHER RESIDUAL RISKS ARE THOSE THAT WOULD NORMALLY BE EXPECTED BY COMPETENT PERSONS OR CONTRACTORS ENGAGED ON WORK OF THIS NATURE OR TYPE.
24. FOUL DRAINAGE SUBJECT TO TECHNICAL APPROVAL FROM SOUTHERN WATER.
25. GEOTECHNICAL ENGINEER TO CONFIRM SOAKAWAY OFFSETS FROM BUILDINGS.
25. ALL DRAINAGE CONNECTIONS DIRECTLY TO SEWERS TO BE MADE VIA OBLIQUE 45° JUNCTIONS.

LEGEND

- DEVELOPMENT BOUNDARY
- HIGHWAY BOUNDARY
- FFL 8.325 — PROPOSED FINISHED FLOOR LEVEL (mAOD)
- FGL 8.325 — PROPOSED FINISHED GARAGE LEVEL (mAOD)
- x EX. (7.000) — EXISTING LEVEL (mAOD)
- x 7.000 — PROPOSED LEVEL (mAOD)
- x SBL: 6.975 — PROPOSED PERMEABLE PAVING SUB-BASE INVERT LEVELS
- 700mm DEEP PERMEABLE PAVING — MAIN ROAD CONSTRUCTION DEPTHS (WHERE SBIL ARE NOT SHOWN DEPTHS ARE BASED ON FULL CONSTRUCTION DEPTH)
- 1:40 — PROPOSED GRADIENT
- 7.500 — PROPOSED CONTOURS (SEE NOTE 6)
- PROPOSED RETAINING WALL
- PROPOSED CONCRETE GRAVEL BOARD
- RAISED DPC/TANKING
- EXPOSED BRICKWORK/UNDERBUILD
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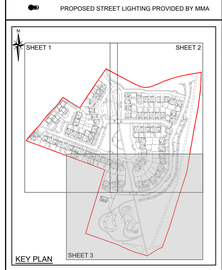
- DIFFUSER UNIT (REFER TO ODYSSEY DRAWING 18-344/825 FOR DETAILS)
- FILTER DRAIN (REFER TO ODYSSEY DRAWING 18-344/821 FOR DETAILS)

LEGEND CONT.

- ACO DRAIN (REFER TO ODYSSEY DRAWING 18-344/824 FOR DETAILS)
- ROAD GULLY AND CONNECTION (REFER TO WSCC STANDARD DETAIL S278/38/11)
- PROPOSED CELLULAR STORAGE TANK (REFER TO ODYSSEY DRAWING 18-344/825)
- PROPOSED PERMEABLE BLOCK PAVING (REFER TO ODYSSEY DRAWING 18-344/821)
- INDICATIVE SERVICE CORRIDOR
- CHECK DAM (REFER TO ODYSSEY DRAWING 18-344/825)
- FOUL WATER RISING MAIN
- RISING MAIN WASHOUT CHAMBER
- TREE ROOT PROTECTION ZONES
- 600mm DEEP INFILTRATION SWALE WITH 1 IN 3 SIDE SLOPES AND 1m WIDE BASE
- KERB DRAIN TO WSCC/S278/38/02 WITH GULLY OUTLET CONNECTION AT LOW POINT
- WG — WEIR KERB OFFLET GULLY. (REFER TO ODYSSEY DRAWING 18-344/825 FOR DETAIL)
- BAGWORK HEADWALL. REFER TO WSCC DETAIL S278/S38/23 FOR DETAIL
- PROPOSED STREET LIGHTING PROVIDED BY MMA

TENDER ISSUE



KEY PLAN

Rev	Amendments	Drn	Chk	Apd	Date
F	UPDATED TO SUIT ARUN DC COMMENTS	SOM	SG	LH	19.02.21
E	UPDATED TO SUIT CLIENT COMMENTS	SOM	SG	LH	29.01.21
D	UPDATED TO SUIT CLIENT COMMENTS	SOM	SG	LH	27.01.21
C	UPDATED TO SUIT CLIENT COMMENTS	JA	SG	RM	28.10.20
B	UPDATED TO SUIT REVISED SITE LAYOUT	JA	SG	LH	09.10.20
A	UPDATED TENDER ISSUE	JA	SG	LH	27.08.20

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Job Title: FORD LANE, YAPTON

Drawing Title: ENGINEERING LAYOUT SHEET 3 OF 3

Client: REDROW

Scale	Date	Designed
1:250 @A0	FEB 2020	JA
Drawn: JA	Checked: SG	Approved: LH
Job No: 18-344	Drawing No: 18-344/802	Rev: F

P:\18-344 - Ford Lane, Yapton\Tech\Acad\Drawings\800 Series (Detailed Design)\18-344-802 Engineering Layout Sheet 3 of 3.dwg

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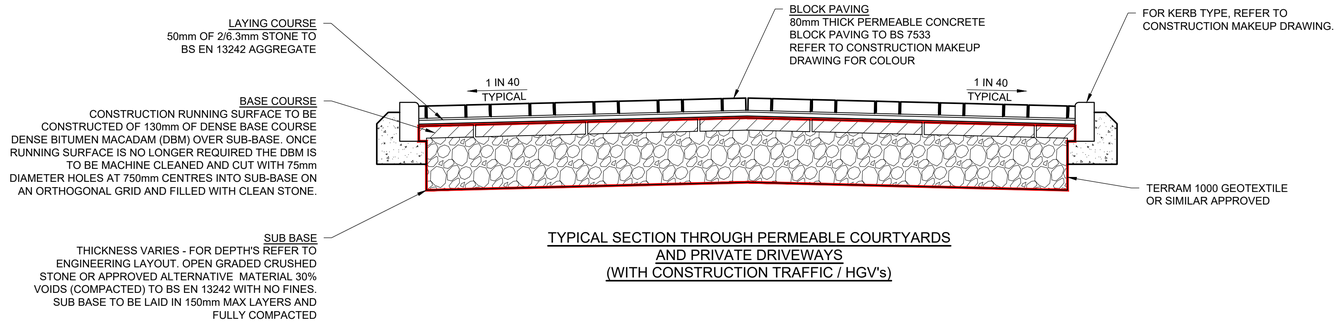
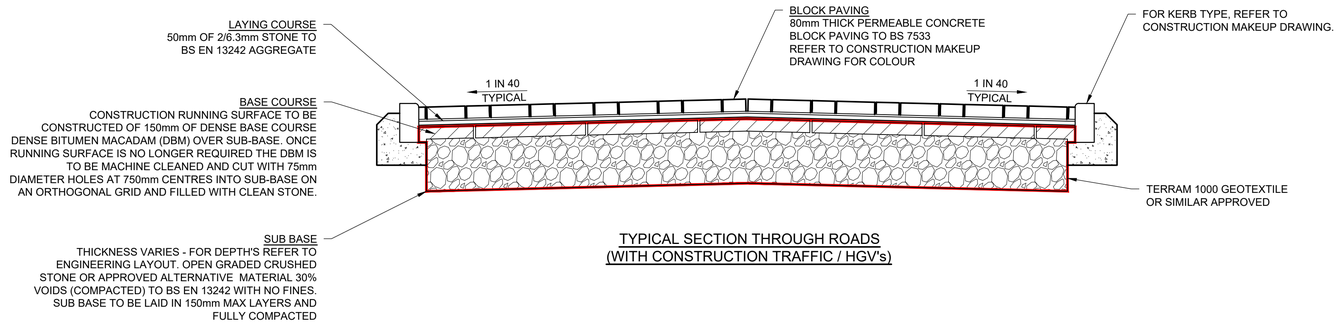
APPENDIX B

Odyssey Drawings 18-344/821, 823 – 825, 836

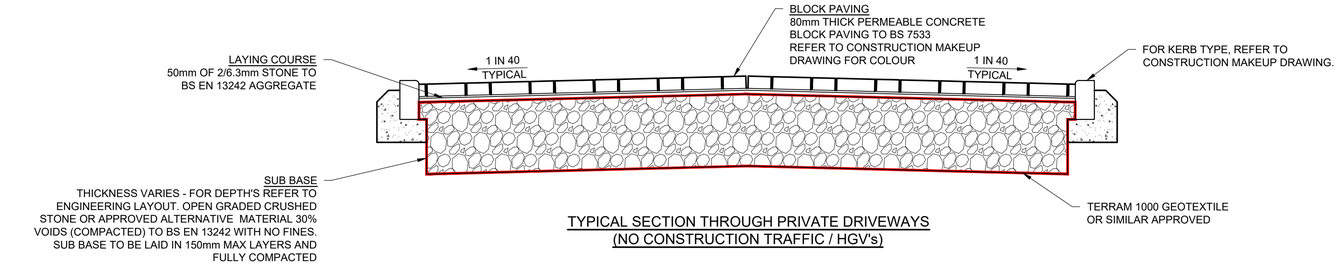
Construction Details



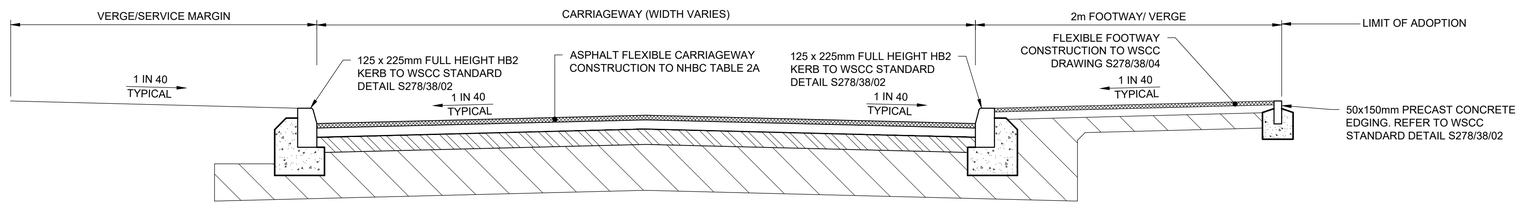
TYPICAL SECTION THROUGH PERMEABLE COURTYARDS AND PRIVATE DRIVEWAYS (WITH CONSTRUCTION TRAFFIC / HGV's)



TYPICAL SECTION THROUGH ROADS (WITH CONSTRUCTION TRAFFIC / HGV's)



TYPICAL SECTION THROUGH PRIVATE DRIVEWAYS (NO CONSTRUCTION TRAFFIC / HGV's)

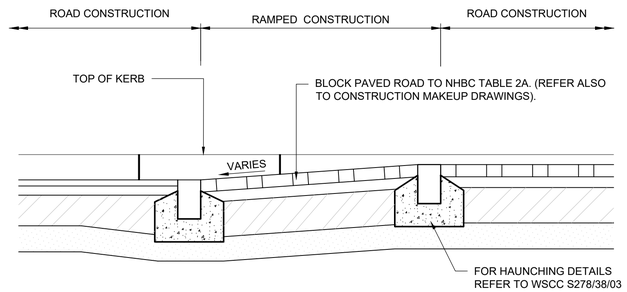


TYPICAL SECTION THROUGH CARRIAGEWAY

TABLE '2A' PRIVATE ROAD HAVING FREQUENT USE BY COMMERCIAL VEHICLES			
CONSTRUCTION		ROAD TYPE	
		BITUMINOUS MACADAM	ROAD BLOCK PAVERS
SUB-BASE	GRANULAR SUB-BASE MATERIAL TYPE 1 TO CLAUSE 803 TABLE 8/2 MCHW VOLUME 1 SERIES 800 (2).	TABLE 3*	WHERE CBR <5% = 150 WHER CBR >5% = TABLE 3*
BASE (ROAD BASE)	DENSE BITUMINOUS MACADAM (100/150 PEN PAVING GRADE BITUMEN) WITH CRUSHED ROCK AGGREGATE TO BS 4987(GROUP 1 MIX)	100 (0/32mm SIZE TO CLAUSE 5.2)	N/A
	CONCRETE DESIGNATION (BS 8500-2 TABLE 7)	N/A	N/A
BINDER COURSE (BASE COURSE)	DENSE BITUMINOUS MACADAM (100/150 PEN PAVING GRADE BITUMEN) WITH CRUSHED ROCK AGGREGATE TO BS 4987 (GROUP 2 MIX)	60 (0/20mm SIZE TO CLAUSE 6.5)	60 (0/20mm SIZE TO CLAUSE 6.5)
SURFACE COURSE (WEARING COURSE)	DENSE BITUMINOUS MACADAM (100/150 PEN PAVING GRADE BITUMEN) WITH CRUSHED ROCK AGGREGATE TO BS 4987 (GROUP 3 MIX)	30 (0-10mm SIZE TO CLAUSE 7.4)	N/A
	HOT ROLLED ASPHALT TO BS 594-1	40 (DESIGNATION 30% 0/14)	N/A
	MASTIC ASPHALT TO BS 1447	30 (GRADE S - 40% 0/10mm SIZE)	N/A
	CONCRETE DESIGNATION (BS 8500-2 TABLE 7)	N/A	N/A
BEDDING COURSE	SHARP SAND TO BS 7533-3 CATEGORY II OF ANNEX D	N/A	50
PAVERS	BLOCK PAVERS TO BS 6717 OF CLASS MARKINGS W2, A2 AND S3 (WEATHERING, ABRASION AND SLIP/SKID CLASSES)	N/A	80

RECOMMENDED DEISGN CBR AS PER LEAP REPORT IS 2.9%. IN SITU TESTING SHOULD BE CARRIED OUT ON SITE AT AGREED LOCATIONS/ INTERVALS/ DEPTHS TO CONFIRM CBR AT FORMATION AND DESIGN TO SUIT SITE INSPECTOR APPROVALS.

TABLE '3' MINIMUM SUB-BASE THICKNESS FOR PAVED AREAS		
CBR VALUES	MINIMUM THICKNESS (mm) OF SUB-BASE *(CONSOLIDATED IN ACCORDANCE WITH MCHW VOLUME 1 CLAUSE 801, TABLE 8/1)*	
	WITHOUT GEOTEXTILE	WITH GEOTEXTILE
< 2%	N/A	300
2-3%	325	225
3-5%	250	150
5-7%	150	N/A
7-20%	100	N/A



SECTION THROUGH RAISED TABLE

WEST SUSSEX COUNTY COUNCIL STANDARD DETAILS TO BE REFERRED TO THROUGHOUT THE CONSTRUCTION	
DRAWING NO:	DRAWING TITLE:
S278/38/02 REV B	APPROVED KERB TYPE SELECTION SHEET 1
S278/38/03 REV A	APPROVED KERB TYPE SELECTION SHEET 2
S278/38/04 REV B	FOOTWAY/ CYCLEWAY TYPE 1 & 2
S278/38/06 REV A	FOOTWAY/ FOOTPATH (RURAL) TYPE 5
S278/38/07 REV C	FOOTWAY CROSSOVER TYPE 1 - RESIDENTIAL
S278/38/09 REV B	SERVICE MARGINS
S278/38/16 REV D	STREET FURNITURE - RAMP FEATURE
S278/38/18 REV A	STREET FURNITURE - TACTILE CROSSINGS
S278/38/20 REV B	CARRIAGEWAY TIE-IN OPTIONS
CARRIAGEWAY TIE-IN OPTIONS	CARRIAGEWAY FLEXIBLE SPECIFICATION

REDROW GROUP STANDARD DETAILS TO BE REFERRED TO THROUGH THE CONSTRUCTION	
DRAWING NO:	TITLE
F-SD0105	LAND DRAINAGE DETAILS / FILTER DRAINS
F-SD0114	TYPICAL PATIO / PAVING DETAILS
F-SD0300	LEVEL AND STANDARD THRESHOLDS

NOTES

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THE MANUAL FOR CONTRACT DOCUMENTS, VOLUME 1, SPECIFICATION FOR HIGHWAY WORKS, WSCC SPECIFICATION AND ALL OTHER RELATED DRAWINGS ISSUED.
2. IF THERE IS ANY AMBIGUITY BETWEEN THE SPECIFICATION AND THE DRAWINGS, THE CONTRACTOR SHALL IMMEDIATELY INFORM THE ENGINEER.
3. DO NOT SCALE FROM THIS DRAWING. WORK FROM FIGURED DIMENSIONS ONLY.
4. ALL DIMENSIONS SHOWN ON THIS DRAWING ARE IN METRES
5. ALL DIMENSIONS, LEVELS AND SURVEY GRID CO-ORDINATES ARE TO BE CHECKED ON SITE AND THE ENGINEER NOTIFIED IMMEDIATELY OF ANY DISCREPANCIES PRIOR TO THE COMMENCEMENT OF THE WORKS.
6. NO DEVIATION FROM THE DETAILS SHOWN ON THIS DRAWING IS PERMITTED WITHOUT PERMISSION FROM THE ENGINEER.
7. FOR CONSTRUCTION MAKEUP REFER TO ODYSSEY DRAWING NUMBERS 18-344/803-805.
8. FOR ENGINEERING LAYOUTS REFER TO ODYSSEY DRAWING NUMBERS 18-344/800-802.

TENDER ISSUE

Rev	Amendments	Drn	Chk	App	Date
B	PERMEABLE PAVING SUB-BASE AMENDED TO SUIT ARUN DC COMMENTS	SG	LH	LH	19.02.21
A	DETAILS AMENDED TO SUIT TENDER UPDATE	JA	SG	LH	27.08.20

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Job Title
FORD LANE, YAPTON

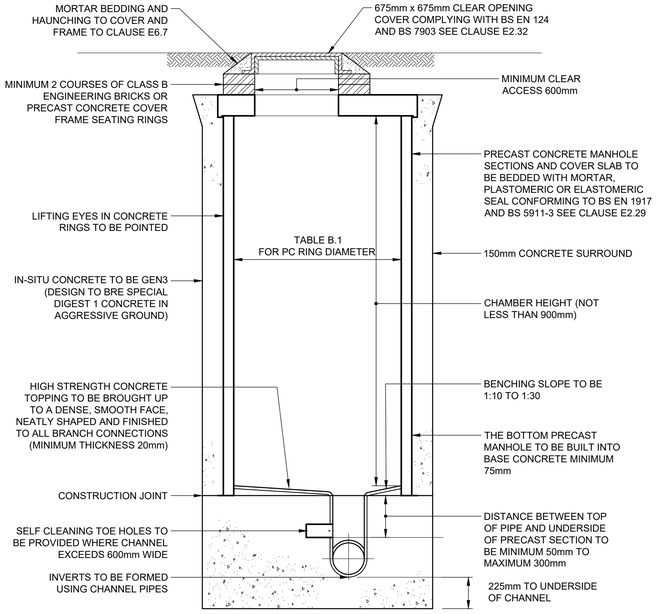
Drawing Title
PRIVATE CONSTRUCTION DETAILS

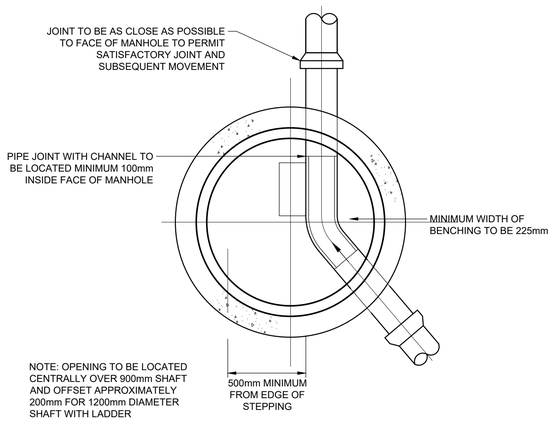
Client
REDROW

Scale	Date	Designed
NTS @ A1	FEB 2020	JA
Drawn	Checked	Approved
HM	SG	LH
Job No	Drawing No	Rev
18-344	18-344/821	B

P:\18-344 - Ford Lane, Yapton\Tech\Acad\Drawings\800 Series (Detailed Design)\18-344-821 Private Construction Details.dwg

ARUN DISTRICT COUNCIL V08/21DOC



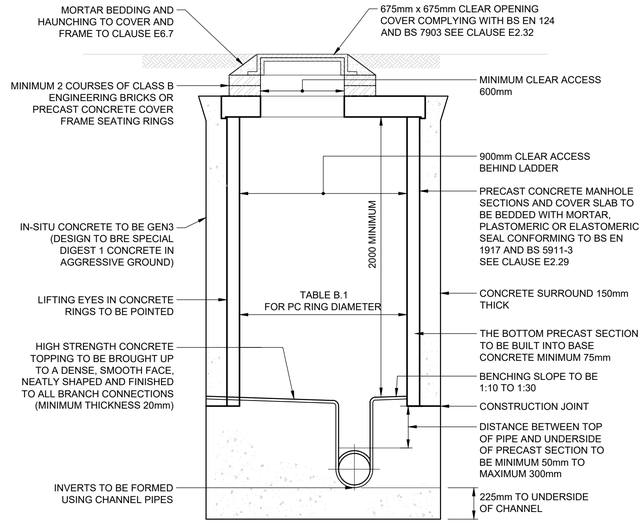


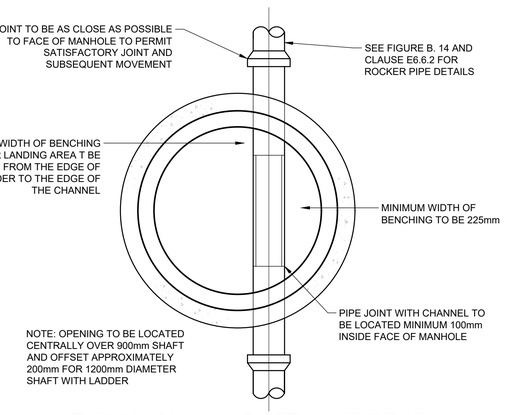
TYPICAL MANHOLE DETAIL - TYPE 2

DEPTH FROM COVER LEVEL TO SOFFIT OF PIPE 1.5m - 3m

TABLE B.1

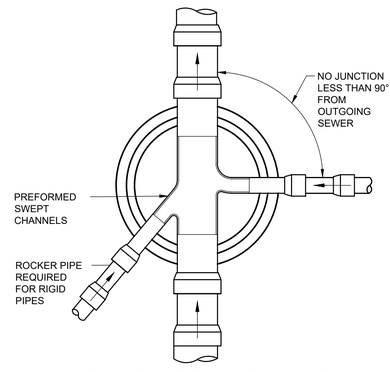
NOMINAL INTERNAL DIAMETER OF LARGEST PIPE IN MANHOLE (mm)	MINIMUM NOMINAL INTERNAL DIMENSION OF MANHOLE (mm)
LESS THAN 375	1200
375 - 450	1350
500 - 700	1500
750 - 900	1800
GREATER THAN 900	PIPE DIAMETER + 900





TYPICAL MANHOLE DETAIL - TYPE 1B

DEPTH FROM COVER LEVEL TO SOFFIT OF PIPE 3-6m

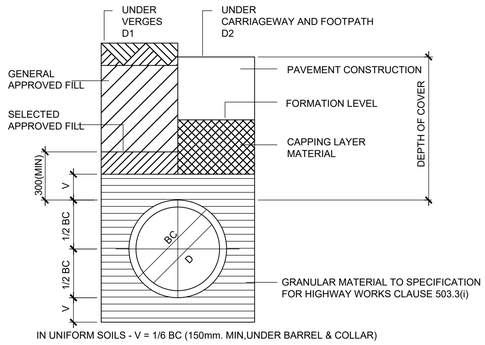


RIGID PIPES BUILT INTO MANHOLE SHOULD HAVE A FLEXIBLE JOINT AS CLOSE AS FEASIBLE TO THE EXTERNAL FACE OF THE STRUCTURE AND THE LENGTH OF THE NEXT ROCKER PIPE SHOULD BE SHOWN

NOMINAL DIAMETER (mm)	MAXIMUM EFFECTIVE LENGTH (m)
150 - 600	0.6
601 - 750	1.00
OVER 750	1.25

ALL PIPES ENTERING THE BOTTOM OF THE MANHOLE TO HAVE SOFFITS LEVEL

TYPICAL ARRANGEMENT OF PIPE JUNCTIONS WITHIN MANHOLES



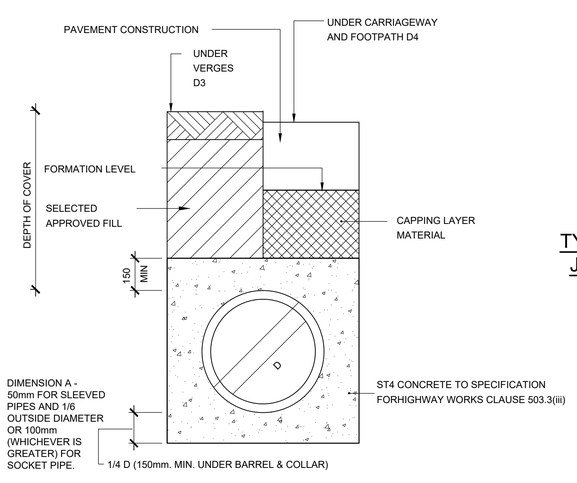
IN UNIFORM SOILS - V = 1/6 BC (150mm. MIN,UNDER BARREL & COLLAR)

IN MIXED SOILS CONTAINING IRREGULAR HARD SPOTS - V = 1/4 BC (200mm. MIN)

DESIGN D1 (UNDER VERGES - >900 COVER)
DESIGN D2 (UNDER CARRIAGEWAYS - >1200 COVER)

1. WIDTH OF TRENCHES TO BE CONFIRMED BY THE CONTRACTOR ON SETTING OUT INFORMATION.
2. ALL PIPES & CULVERTS SHALL HAVE FLEXIBLE JOINTS
3. DESIGN D3/4 SHALL BE USED WHEN THE COVER FROM TOP OF PIPE TO FINISHED LEVEL IS LESS THAN 900 WITHIN THE HIGHWAY & 900 IN VERGES ETC.
4. IN DESIGN D3/4 A 20 GAP SHALL BE FORMED IN THE CONCRETE SURROUND AT THE OUTER END OF THE SOCKET AT EACH FLEXIBLE JOINT. THE GAP SHALL EXTEND TO THE FULL THICKNESS OF THE CONCRETE & SHALL BE FILLED WITH SOFT FIBRE BOARD, EXPANDED POLYSTYRENE OR SIMILAR APPROVED MATERIAL.

BEDDING DETAIL - CLASS 'S'



DESIGN D3 (UNDER VERGES - <900 COVER)
DESIGN D4 (UNDER CARRIAGEWAYS - <1200 COVER)

BEDDING DETAIL - CLASS 'Z'

NOTES

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THE MANUAL FOR CONTRACT DOCUMENTS, VOLUME 1, SPECIFICATION FOR HIGHWAY WORKS, WSCC SPECIFICATION AND ALL OTHER RELATED DRAWINGS ISSUED.
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4. ALL DIMENSIONS SHOWN ON THIS DRAWING ARE IN METRES
5. ALL DIMENSIONS, LEVELS AND SURVEY GRID CO-ORDINATES ARE TO BE CHECKED ON SITE AND THE ENGINEER NOTIFIED IMMEDIATELY OF ANY DISCREPANCIES PRIOR TO THE COMMENCEMENT OF THE WORKS.
6. NO DEVIATION FROM THE DETAILS SHOWN ON THIS DRAWING IS PERMITTED WITHOUT PERMISSION FROM THE ENGINEER.

TENDER ISSUE

Rev	Amendments	Drn	Chk	App	Date
A	UPDATED TO SUIT LATEST DRAINAGE STRATEGY	JA	SG	LH	27.08.20

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Job Title: FORD LANE, YAPTON

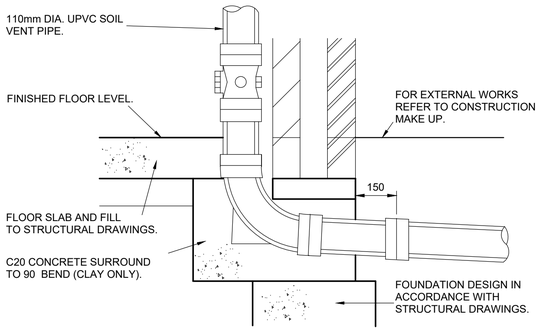
Drawing Title: ADOPTABLE DRAINAGE CONSTRUCTION DETAILS

Client: REDROW

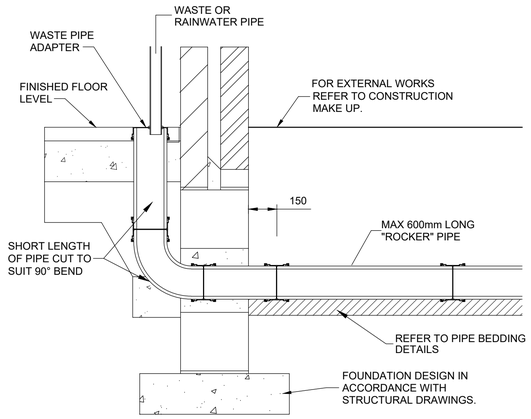
Scale	Date	Designed
NTS @ A1	FEB 2020	JA
Drawn	Checked	Approved
HM	SG	LH
Job No	Drawing No	Rev
18-344	18-344/823	A

P:\18-344 - Ford Lane, Yapton\Tech\Acad\Drawings\800 Series (Detailed Design)\18-344-823 Adoptable Drainage Construction Details.dwg

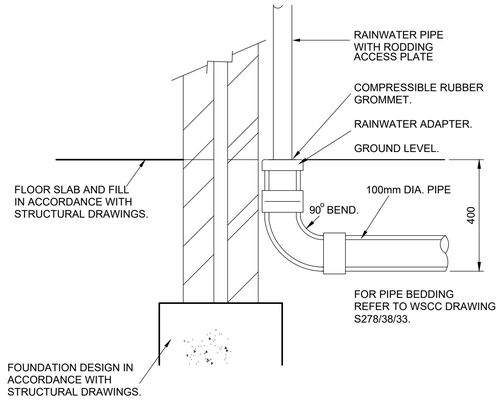
ARUN DISTRICT COUNCIL V080120DC



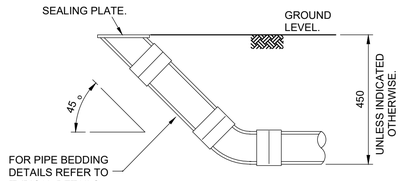
SOIL VENT PIPE CONNECTION



WASTE PIPE DIRECT CONNECTION DETAIL

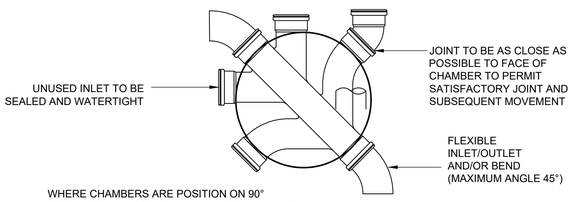


RAINWATER PIPE CONNECTION



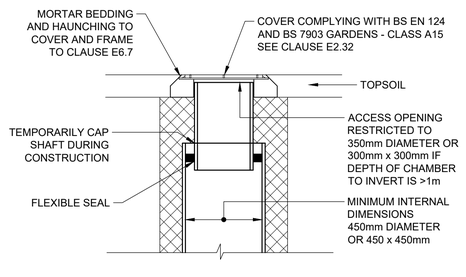
RODDING EYE DETAIL

TO BE USED IN PEDESTRAIN AND LANDSCAPED AREAS NOT SUBJECT TO VEHICULAR LOADING. MAXIMUM DEPTH TO INVERT 600mm.

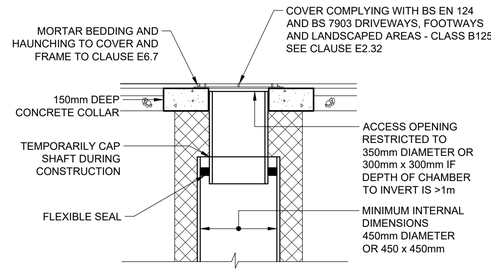


TYPICAL INSPECTION CHAMBER BASE LAYOUT - TYPE 3

(FLEXIBLE MATERIAL DETAIL)



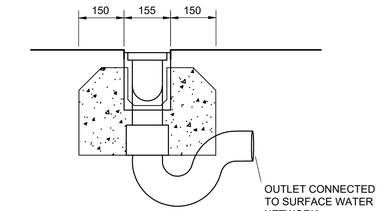
SITED IN PRIVATE GARDENS



SITED IN DOMESTIC DRIVEWAYS OR FOOTWAYS

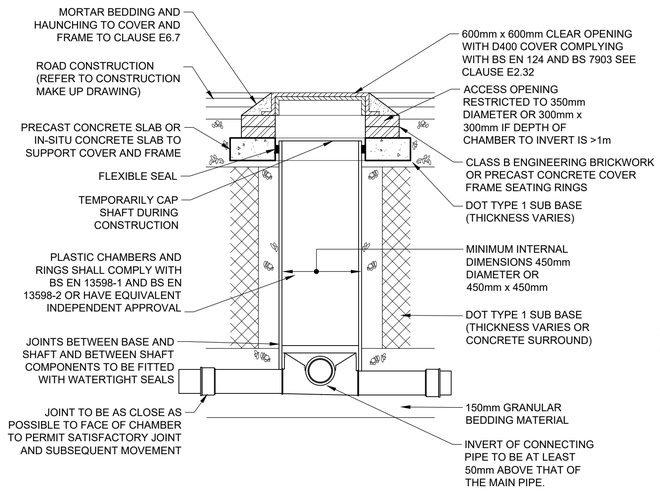
PLASTIC CHAMBERS AND RINGS SHALL COMPLY WITH BS EN 13598-1 AND BS EN 13598-2 OR HAVE EQUIVALENT INDEPENDENT APPROVAL

ALTERNATIVE TOP DETAILS FOR DOMESTIC DRIVEWAYS/ FOOTWAYS/ LANDSCAPED AREAS - TYPE 3



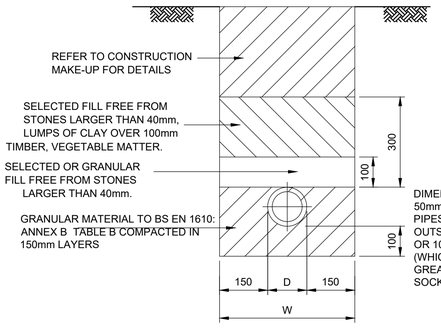
S100 POLYESTER RESIN CONCRETE DRAINAGE CHANNEL WITH CONCRETE CLASS ST4 BED AND HAUNCH. CHANNEL TO BE FITTED WITH HEAVY DUTY GRATING IN VEHICULAR AREAS. 100MM DIA OUTLET TO BE TRAPPED WITH LOW BACK P-TRAP. INSTALLED TO MANUFACTURERS RECOMMENDATIONS.

TYPICAL ACO DETAIL



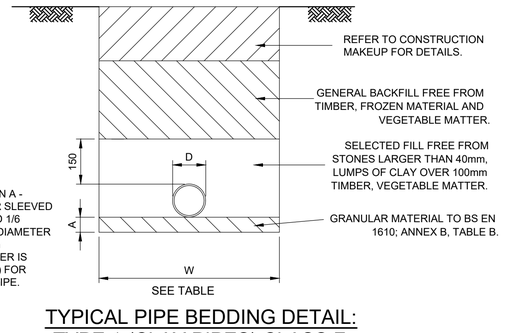
TYPICAL INSPECTION CHAMBER DETAIL - TYPE 3

(FLEXIBLE MATERIAL DETAIL) MAXIMUM DEPTH FROM COVER LEVEL TO SOFFIT OF PIPE IN AREAS SUBJECT TO VEHICLE LOADING 3m, NON-ENTRY



TYPICAL PIPE BEDDING DETAIL: TYPE 3 (UPVC PIPES)

LOCATION: PEDESTRIAN AREAS: 0.6 m - 8.0 m DEEP.
VEHICLE AREAS: 1.2 m - 8.0 m DEEP.



TYPICAL PIPE BEDDING DETAIL: TYPE 1 (CLAY PIPES) CLASS F

LOCATION: PEDESTRIAN AREAS UP TO 8.0 m DEEP.
VEHICLE AREAS: 1.2 m - 8.0 m (100mm DIA. PIPE).
1.2 m - 8 m (150mm DIA. PIPE).

TRENCH WIDTHS FOR VARIOUS SIZE PIPES					
D	100	150	225	300	375
W	450	600	750	750	900

NOTES

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THE MANUAL FOR CONTRACT DRAWINGS, VOLUME 1, SPECIFICATION FOR HIGHWAY WORKS, WEST SUSSEX COUNTY COUNCIL SPECIFICATION, "SEWERS FOR ADOPTION SEVENTH EDITION - A DESIGN GUIDE FOR DEVELOPERS", LOCAL WATER AUTHORITY GUIDANCE AND ALL OTHER RELATED DRAWINGS ISSUED.
2. THE CENTRELINE OF THE MANHOLE IS NOT NECESSARILY COINCIDENTAL WITH THE CENTRELINE OF THE MAIN PIPE.
3. POSITION OF MANHOLE COVER SLAB AND STEP RUNGS TO BE DIRECTED ON SITE.
4. WHERE PIPES OF DIFFERENT DIAMETERS ARE BUILT INTO THE MANHOLE, THEY SHOULD BE LAID TO COMMON SOFFIT UNLESS OTHERWISE STATED.
5. MINIMUM GULLY PIPE GRADIENT TO BE 1:150
6. AT SIGNIFICANT CHANGES IN DIRECTION, THE LARGEST PRACTICAL RADIUS OF CHANNEL JUNCTIONS SHALL BE USED.
7. ALL MORTAR TO BE CLASS 1 UNLESS NOTED OTHERWISE.
8. BRICKS TO BE ENGINEERING CLASS B TO BS EN 771-1, LAID IN ENGLISH BOND ON CLASS (i) MORTAR TO CLAUSE 2404, SPECIFICATION FOR HIGHWAY WORKS. ANY OVER EXCAVATION TO BE MADE GOOD.
9. CONNECTIONS TO CARRIER DRAINS TO BE BY MEANS OF 'Y' JUNCTIONS OR SADDLES, AS APPROPRIATE.
10. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE STATED.
11. ALL TESTING TO BE CARRIED OUT AT THE CONTRACTORS EXPENSE. ALL INSPECTION TO BE IN ACCORDANCE WITH SEWERS FOR ADOPTION SEVENTH EDITION AND WEST SUSSEX COUNTY COUNCIL
12. PERMITTED MATERIAL FOR PIPES ARE SHOWN IN PART E, SEWERS FOR ADOPTION SEVENTH EDITION.
13. ALL CONCRETE AND CONCRETE PRODUCTS TO BE SULPHATE RESISTING.

TENDER ISSUE

Rev	Amendments	Drn	Chk	App	Date
B	DRAWING TITLE AMENDED	SG	LH	LH	19.02.21
A	UPDATED TO SUIT LATEST DRAINAGE STRATEGY	JA	SG	LH	27.08.20

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Job Title: FORD LANE, YAPTON

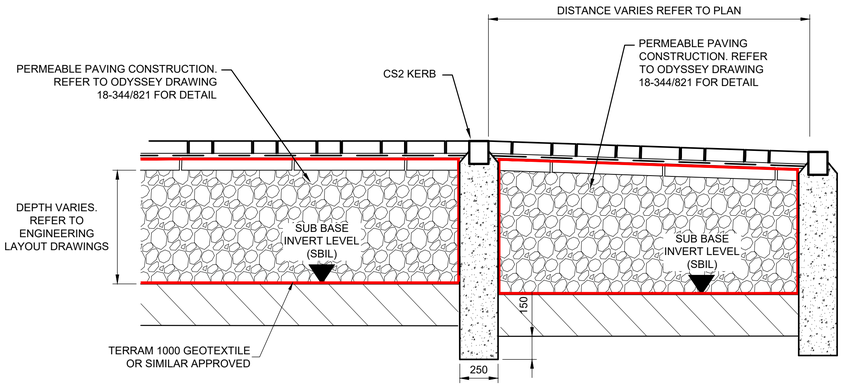
Drawing Title: PRIVATE DRAINAGE CONSTRUCTION DETAILS SHEET 1

Client: REDROW

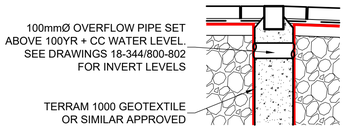
Scale	Date	Designed
NTS @ A1	FEB 2020	JA
Drawn	Checked	Approved
HM	SG	LH
Job No	Drawing No	Rev
18-344	18-344/824	B

P:\18-344 - Ford Lane, Yapton\Tech\Acad\Drawings\800 Series (Detailed Design)\18-344-824 Private Drainage Construction Details Sheet 1.dwg

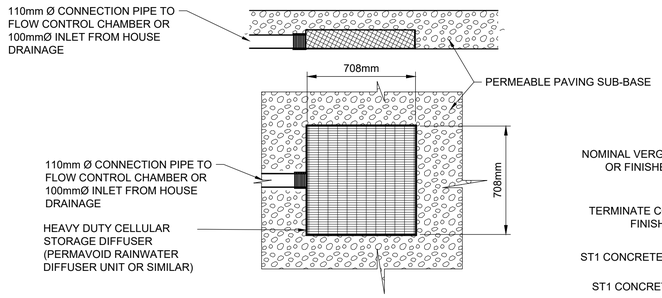
ARUN DISTRICT COUNCIL V1901200C



TYPICAL CHECK DAM DETAIL

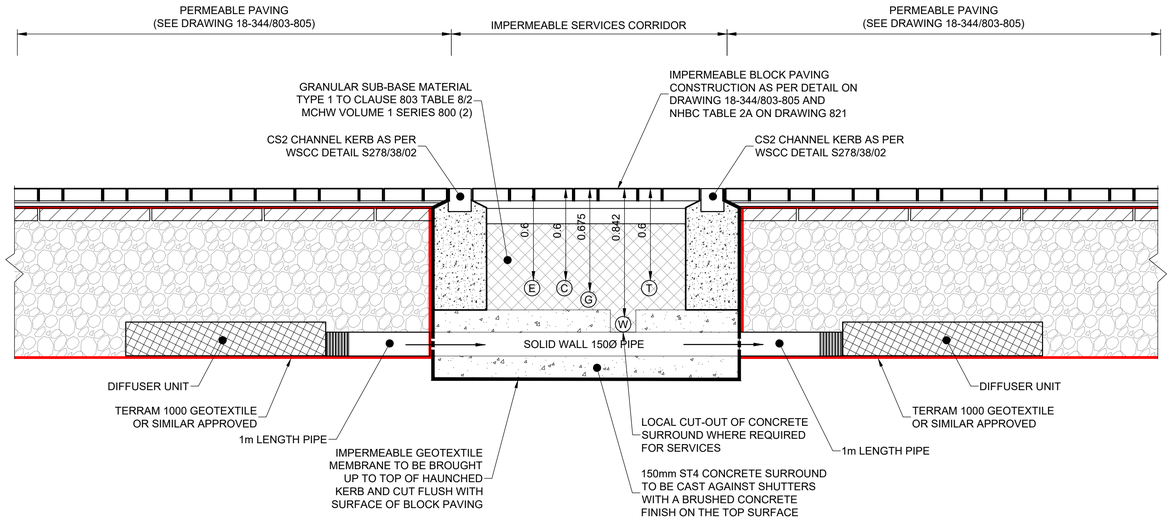


CHECK DAM OVERFLOW DETAIL

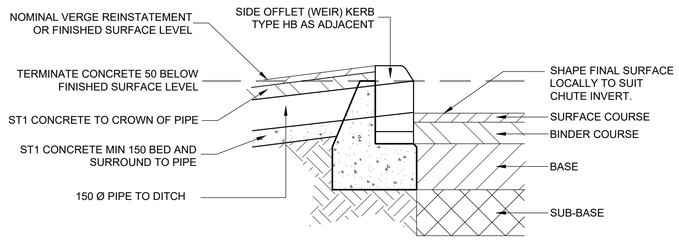


TYPICAL PLAN & SECTION THROUGH DIFFUSER DETAIL

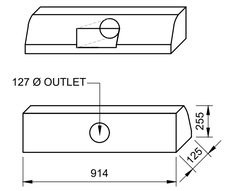
PERMAVOID RAINWATER DIFFUSER UNIT OR SIMILAR APPROVED



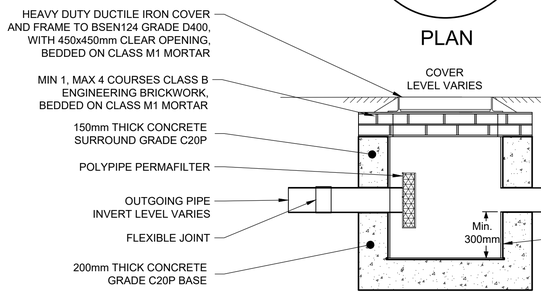
SECTION THROUGH IMPERMEABLE SERVICES CORRIDOR



SECTION THROUGH OFFLET (WEIR) KERB



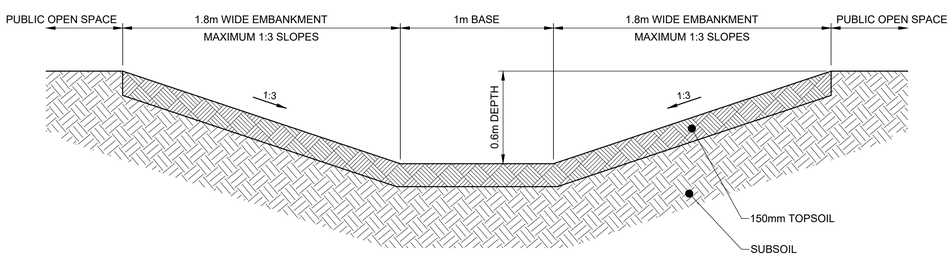
SIDE OFFLET (WEIR) KERB (CONCRETE)



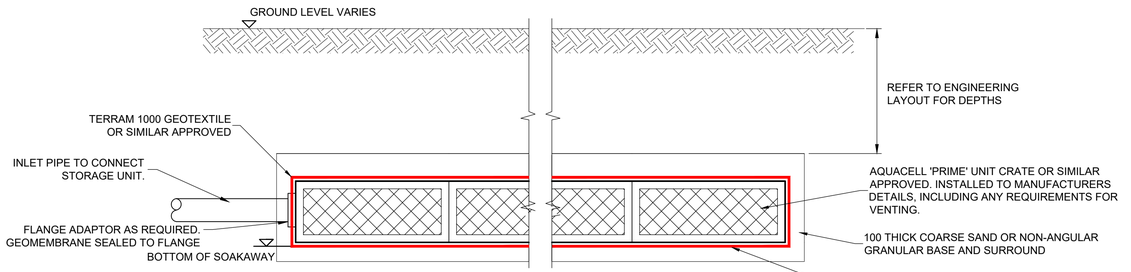
PLAN

POLYPIPE CATCHPIT INSPECTION CHAMBER INCORPORATING DEBRIS DEVICE - NON ADOPTABLE

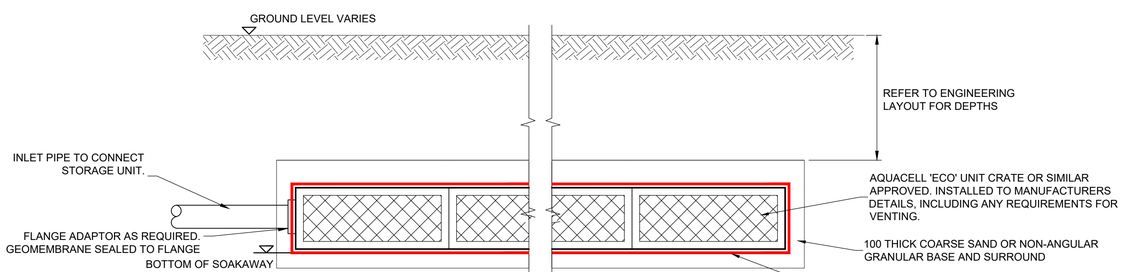
(OR SIMILAR APPROVED)



TYPICAL SECTION THROUGH SWALE



CELLULAR SOAKAWAY (PUBLIC OPEN SPACE)



CELLULAR SOAKAWAY (GARDEN)

NOTES

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6. NO DEVIATION FROM THE DETAILS SHOWN ON THIS DRAWING IS PERMITTED WITHOUT PERMISSION FROM THE ENGINEER.
8. FOR ENGINEERING LAYOUTS REFER TO ODYSSEY DRAWING NUMBERS 18-344/800-802.

TENDER ISSUE

Rev	Amendments	Drn	Chk	App	Date
C	CHECK DAM OVERFLOW DETAIL ADDED	SOM	SG	LH	19.02.21
B	UPDATED TO SUIT CLIENT COMMENTS	SOM	SG	LH	29.01.21
A	UPDATED TO SUIT LATEST DRAINAGE STRATEGY	JA	SG	LH	27.08.20

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Fax: 01256 331134
E: info@odysseyconsult.co.uk
W: www.odysseyconsult.co.uk

Job Title: FORD LANE, YAPTON

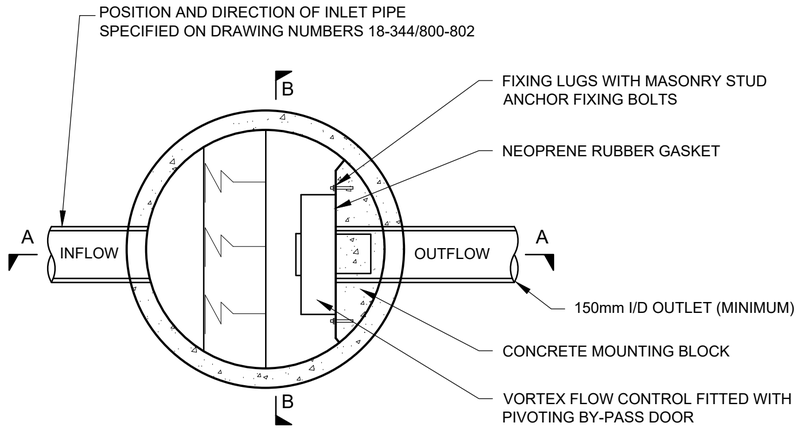
Drawing Title: PRIVATE DRAINAGE CONSTRUCTION DETAILS SHEET 2

Client: REDROW

Scale	Date	Designed
NTS @ A1	FEB 2020	JA
Drawn	Checked	Approved
HM	SG	LH
Job No	Drawing No	Rev
18-344	18-344/825	C

P:\18-344 - Ford Lane, Yapton\Tech\Acad\Drawings\800 Series (Detailed Design)\18-344-825 Private Drainage Construction Details Sheet 2.dwg

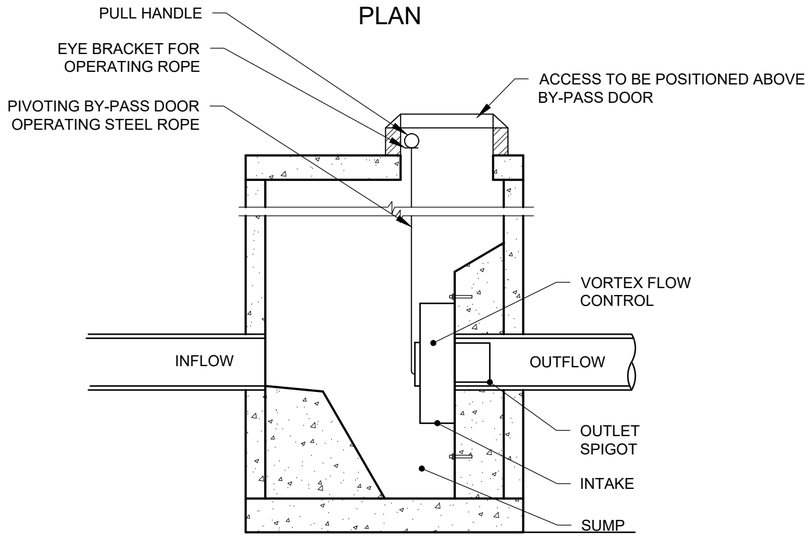
ARUN DISTRICT COUNCIL V2021/DOC



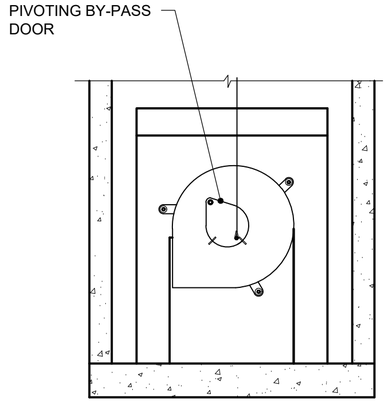
PLAN

HYDRO-BRAKE
TECHNICAL SPECIFICATION

MH REF	UNIT REF	FLOW (L/S)	MH SIZE
TANK 1	MD-SHE-0046-7000-0394-7000	0.7	1200
TANK 2	MD-SHE-0046-7000-0410-7000	0.7	1200



SECTION A - A



SECTION B - B

TYPICAL HYDRO-BRAKE FLOW CONTROL CHAMBER DETAIL
CHAMBERS TO BE INSTALLED AS PER MANUFACTURERS RECOMMENDATIONS

NOTES

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THE MANUAL FOR CONTRACT DOCUMENTS, VOLUME 1, SPECIFICATION FOR HIGHWAY WORKS, WSCC SPECIFICATION AND ALL OTHER RELATED DRAWINGS ISSUED.
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6. NO DEVIATION FROM THE DETAILS SHOWN ON THIS DRAWING IS PERMITTED WITHOUT PERMISSION FROM THE ENGINEER.
8. FOR ENGINEERING LAYOUTS REFER TO ODYSSEY DRAWING NUMBERS 18-344/800-802.

TENDER ISSUE

Rev	Amendments	Drn	Chk	App	Date

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W: www.odysseyconsult.co.uk

Job Title
FORD LANE,
YAPTON

Drawing Title
PRIVATE DRAINAGE CONSTRUCTION DETAILS SHEET 3

Client
REDROW

Scale	Date	Designed
N.T.S @ A2	FEB 2021	
Drawn	**Checked**	**Approved**
SG	LH	LH
Job No	**Drawing No**	**Rev**
18-344	18-344/836	

P:\18-344 - Ford Lane, Yapton\Tech\Acad\Drawings\800 Series (Detailed Design)\18-344-836 Private Drainage Construction Details Sheet 3.dwg

ARUN DISTRICT COUNCIL Y/26/21/DOC

APPENDIX C

Odyssey Drawing 18-344/108

Surface Water Catchment and Implementation Plan

NOTES

1. DO NOT SCALE FROM THIS DRAWING. WORK FROM FIGURED DIMENSIONS ONLY.
2. ALL DIMENSIONS SHOWN ON THIS DRAWING ARE IN METRES.
3. THIS DRAWING IS A PRELIMINARY REVIEW ONLY AND SUBJECT TO DETAILED DESIGN.
4. ODYSSEY ACCEPT NO LIABILITY FOR THE ACCURACY OF SURVEY INFORMATION AND LAYOUTS SUPPLIED BY OTHERS.
5. THIS DRAWING IS BASED ON THE PLANNING LAYOUT PROVIDED BY GEOFF PERRY ASSOCIATES. DRAWING REFERENCE A855-065A.
6. FOR PROPOSED SURFACE WATER DRAINAGE LAYOUT, REFER TO ODYSSEY DRAWING 18-344/800-802.

LEGEND

	TANK 1 CATCHMENT *	AREA = 680m^2
	TANK 2 CATCHMENT *	AREA = 1130m^2
	TANK 3 CATCHMENT	AREA = 1410m^2
	TANK 4 CATCHMENT	AREA = 489m^2
	TANK 5 CATCHMENT	AREA = 319m^2
	PLOT SOAKAWAY CATCHMENT	AREA = 1473m^2
	PERMEABLE PAVING CATCHMENT	AREA = 14257m^2
	SWALE CATCHMENT	AREA = 247m^2
	BASIN CATCHMENT *	AREA = 431m^2

*TURNING HEAD FRONTING PLOTS 34 - 36 DRAINS DIRECTLY TO THE BASIN. TANKS 1 AND 2 ARE USED FOR INITIAL STORAGE WITH PARTIAL INFILTRATION AND THEN RELEASED AT A SLOW RATE TO A FURTHER DRAINAGE STRUCTURE BELOW THE BASIN. REFER TO ENGINEERING DRAWINGS FOR FURTHER DETAILS.

FOR PLANNING PURPOSES ONLY

Rev	Amendments	Drn	Chk	App	Date
H	CATCHMENT AREAS ADDED TO KEY	SOM	SG	LH	19.02.21
G	UPDATED TO SUIT CLIENT COMMENTS	SG	LH	LH	29.01.21
F	UPDATED TO SUIT CLIENT COMMENTS	SG	LH	LH	27.01.21
E	SWALE UPDATED	SG	RS	RS	29.10.20
D	TANK 5 CATCHMENT ADDED	JA	SG	LH	16.10.20
C	UPDATED TO SUIT REVISED SITE LAYOUT	SG	LH	LH	09.10.20
B	UPDATED TO SUIT REVISED SITE LAYOUT AND DRAINAGE STRATEGY	JA	SG	LH	16.09.20
A	UPDATED TO SUIT REVISED SITE LAYOUT	LS	SG	LH	18.06.20

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Job Title
FORD LANE, YAPTON

Drawing Title
SURFACE WATER CATCHMENT AND IMPLEMENTATION PLAN

Client
REDROW

Scale	Date	Designed
1:500 @A0	JAN 2020	SG
Drawn	**Checked**	**Approved**
LP	SG	LH
Job No	**Drawing No**	**Rev**
18-344	18-344/108	H

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P:\18-344 - Ford Lane, Yapton\Tech\Acad\Drawings\100 Series (RM)\18-344-108 Surface Water Catchment and Implementation Plan.dwg

AWN-DISTRICT COUNCIL 1/08/2020C

APPENDIX D

Odyssey Drawing 18-344/107

Overland Flow Routes

NOTES

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELATED DRAWINGS ISSUED BY THE ARCHITECT AND ENGINEER.
2. DO NOT SCALE FROM THIS DRAWING. WORK FROM FIGURED DIMENSIONS ONLY.
3. ALL DIMENSIONS SHOWN ON THIS DRAWING ARE IN METRES.
4. ODYSSEY ACCEPT NO LIABILITY FOR THE ACCURACY OF SURVEY INFORMATION AND LAYOUTS SUPPLIED BY OTHERS.
5. THIS DRAWING IS BASED ON THE PLANNING LAYOUT PROVIDED BY GEOFF PERRY ASSOCIATES. DRAWING REFERENCE A855-065A.
6. FOR PROPOSED SURFACE WATER DRAINAGE LAYOUT, REFER TO ODYSSEY DRAWING 18-344/800-802.

LEGEND

- SITE BOUNDARY
- FFL 8.000 — PROPOSED FINISHED FLOOR LEVEL (mAOD)
- GFL 7.00 — PROPOSED GARAGE LEVEL (mAOD)
- 8.000 — PROPOSED HIGHWAY CONTOURS (20mm INTERVAL)
- INDICATIVE DIRECTION OF OVERLAND FLOW
- HP HIGH POINT
- LP LOW POINT

FOR PLANNING PURPOSES ONLY

Rev	Amendments	Drn	Chk	App	Date
H	UPDATED TO SUIT CLIENT COMMENTS	SG	LH	LH	27.01.21
G	UPDATED TO SUIT CLIENT COMMENTS	LS	LH	RS	12.01.21
F	OVERLAND FLOW PATHS UPDATED	LS	LH	RS	11.01.21
E	SWALE UPDATED	SG	RS	RS	29.10.20
D	UPDATED TO SUIT REVISED SITE LAYOUT	SG	LH	LH	09.10.20
C	UPDATED TO SUIT REVISED SITE LAYOUT	JA	SG	LH	16.09.20
B	UPDATED TO SUIT REVISED SITE LAYOUT	LS	SG	LH	18.06.20
A	UPDATED TO SUIT REVISED SITE LAYOUT	KOM	SG	LH	12.06.20

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Job Title: FORD LANE, YAPTON

Drawing Title: OVERLAND FLOW ROUTES

Client: REDROW

Scale	Date	Designed
1:500 @A0	JAN 2020	SG
Drawn	Checked	Approved
LS	SG	LH
Job No	Drawing No	Rev
18-344	18-344/107	H

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APPENDIX E

Odyssey Drawing 18-344/110

Winter Groundwater and Infiltration Data Plan

N

Orchard Business Park

Path (um)

HOLT LANE

CHURCH LANE

THE LYCHGATES

SA1
CL: 7.450mAOD
Infil: 5.5 x 10^{-6} (Shallow)
Infil: 1.6 x 10^{-6} (Deep)

SA2
CL: 8.000mAOD
Infil: 3.3 x 10^{-6} (Shallow)
Infil: 4.1 x 10^{-6} (Deep)

SA3
CL: 8.000mAOD
Infil: 4.0 x 10^{-6} (Shallow)
Infil: 3.8 x 10^{-6} (Deep)

SA4
CL: 8.050mAOD
Infil: 8.6 x 10^{-6} (Shallow)
Infil: 1.3 x 10^{-5} (Deep)

SA4
CL: 7.900mAOD
Infil: 3.1 x 10^{-6} (Shallow)
Infil: 6.5 x 10^{-7} (Deep)

SA5
CL: 8.000mAOD
Infil: 2.5 x 10^{-6} (Shallow)
Infil: N/A

SA5
CL: 7.510mAOD
Infil: 4.8 x 10^{-6} (Shallow)
Infil: 3.0 x 10^{-7} (Deep)

SA6
CL: 7.250mAOD
Infil: 1.7 x 10^{-6} (Shallow)
Infil: N/A

SA7
CL: 7.750mAOD
Infil: 1.7 x 10^{-6} (Shallow)
Infil: 8.3 x 10^{-7} (Deep)

BH104
CL: 7.750mAOD
GW Depth: -3.630m (Jan 20')
GWL: 4.120mAOD
CHALK: Not Encountered

BH101
CL: 7.800mAOD
GW Depth: -2.760m (Feb 20')
GWL: 5.010mAOD
CHALK: -3.300m bgl

BH103
CL: 7.500mAOD
GW Depth: -3.900m (Mar 20')
GWL: 3.600mAOD
CHALK: -3.200m bgl

BH105
CL: 7.250mAOD
GW Depth: -3.050m (Jan 20')
GWL: 4.200mAOD
CHALK: -2.400m bgl

BH150
CL: 8.000mAOD
GW Depth: -6.570m (Oct 19')
GWL: 1.430mAOD
CHALK: -4.000m bgl

SHQ
SH1
MSU

NOTES

1. DO NOT SCALE FROM THIS DRAWING. WORK FROM FIGURED DIMENSIONS ONLY.
2. ALL DIMENSIONS SHOWN ON THIS DRAWING ARE IN METRES.
3. THIS DRAWING IS A PRELIMINARY REVIEW ONLY AND SUBJECT TO DETAILED DESIGN.
4. ODYSSEY ACCEPT NO LIABILITY FOR THE ACCURACY OF SURVEY INFORMATION AND LAYOUTS SUPPLIED BY OTHERS.
5. THIS DRAWING IS BASED ON THE PLANNING LAYOUT PROVIDED BY GEOFF PERRY ASSOCIATES. DRAWING REFERENCE A856-65A.
6. THIS DRAWING IS BASED ON THE INFORMATION PROVIDED IN EASTWOOD AND PARTNERS CONSULTING ENGINEERS REPORT ON INFILTRATION TESTING AND GROUNDWATER MONITORING REF: CAT/RAN/DN/44005-002. RECEIVED MARCH 2020.
7. ALL INFILTRATION RATES ARE SHOWN IN METRES PER SECOND

LEGEND

- DEVELOPMENT BOUNDARY
- INFILTRATION BOUNDARY
- SOAKAGE TEST
- GROUNDWATER MONITORING BOREHOLE
- PRIVATE SURFACE WATER SEWER AND MANHOLE
- TYPE B SURFACE WATER CATCHPIT
- FLOW CONTROL MANHOLE (HYDROBRAKE OR SIMILAR)
- PRIVATE SURACE WATER DRAIN
- TYPE 3 SURFACE WATER INSPECTION CHAMBER
- RODDING EYE
- CATCHPIT INSPECTION CHAMBER
- DIFFUSER UNIT
- FILTER DRAIN
- ACO DRAIN
- ROAD GULLY AND CONNECTION
- PROPOSED CELLULAR SOAKWAY
- PROPOSED PERMEABLE BLOCK PAVING

FOR PLANNING PURPOSES ONLY

Rev	Amendments	Drn	Chk	App	Date
E	UPDATED TO SUIT ARUN DC COMMENTS	SG	LH	LH	19.02.21
D	UPDATED TO SUIT CLIENT COMMENTS	SG	LH	LH	27.01.21
C	SWALE UPDATED	SG	RS	RS	29.10.20
B	TANK 5 ADDED AND PERMEABLE PAVING EXTENT ADJUSTED	JA	SG	LH	16.10.20
A	UPDATED TO SUIT REVISED SITE LAYOUT	SG	LH	LH	09.10.20

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Job Title

FORD LANE,
YAPTON

Drawing Title

WINTER GROUNDWATER
AND INFILTRATION DATA PLAN

Client

REDROW

Scale	Date	Designed
1:500 @A0	SEPT 2020	
Drawn	Checked	Approved
THR	SG	LH
Job No	Drawing No	Rev
18-344	18-344/110	E

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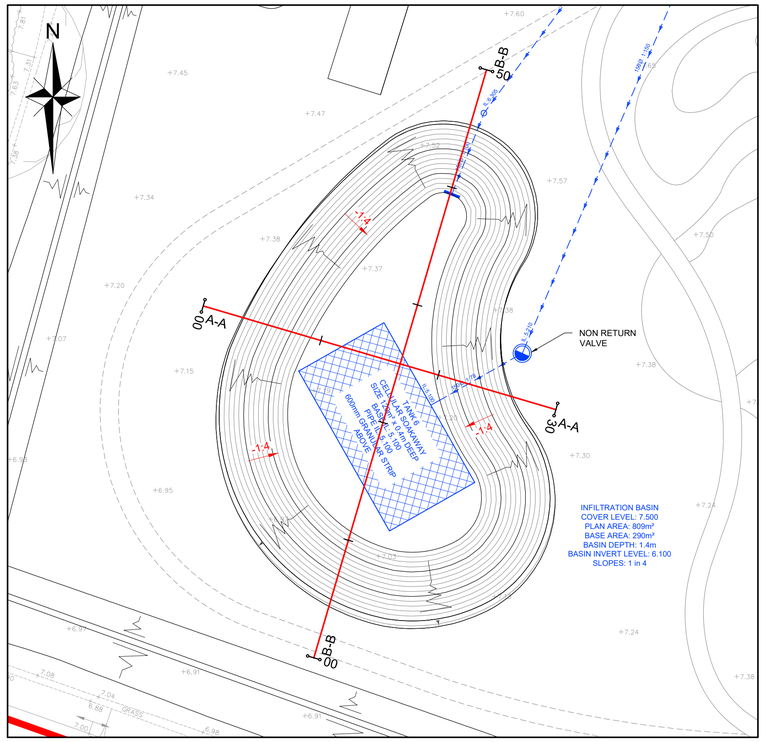
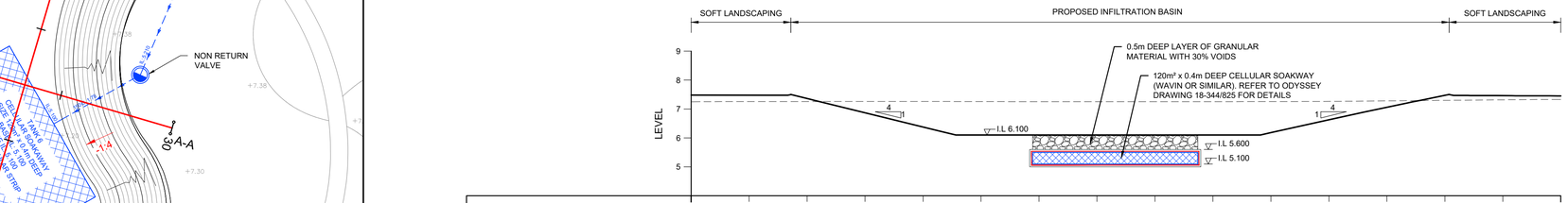
APPENDIX F

Odyssey Drawing 18-344/113

Basin Sections



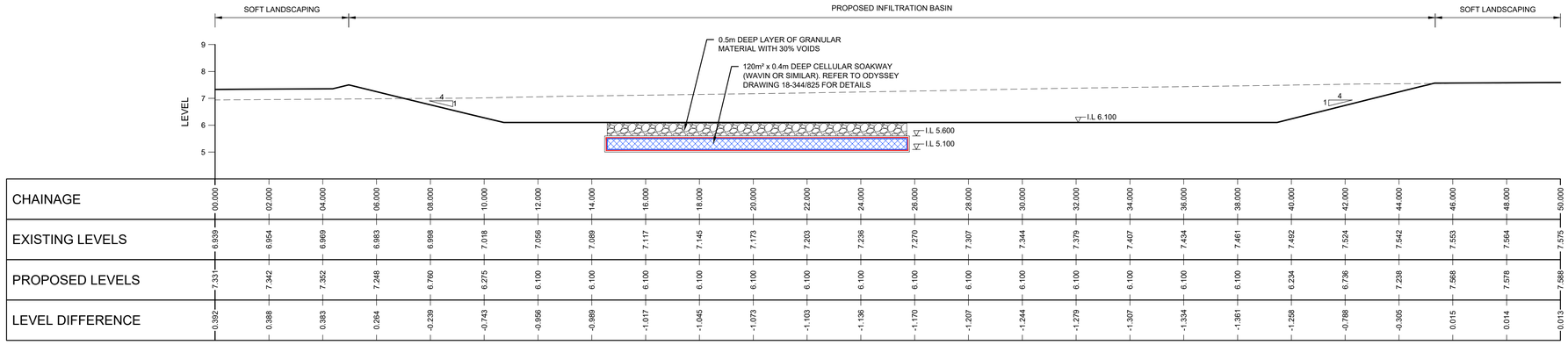
PLAN
(1:250)



CHAINAGE	00.000	02.000	04.000	06.000	08.000	08.000	10.000	12.000	14.000	16.000	18.000	20.000	22.000	24.000	26.000	28.000
EXISTING LEVELS	7.250	7.257	7.258	7.260	7.261	7.256	7.254	7.253	7.253	7.253	7.253	7.257	7.263	7.281	7.299	7.317
PROPOSED LEVELS	7.480	7.477	7.362	6.870	6.378	6.100	6.100	6.100	6.100	6.100	6.100	6.182	6.628	7.058	7.471	7.461
LEVEL DIFFERENCE	0.230	0.220	0.103	-0.390	-0.883	-1.156	-1.154	-1.153	-1.153	-1.153	-1.153	-1.074	-0.635	-0.223	0.172	0.144

CHAINAGE	30.000	32.000	34.000	36.000	38.000	40.000	42.000	44.000	46.000	48.000	50.000	29.998
EXISTING LEVELS	7.344	7.379	7.407	7.434	7.461	7.492	7.524	7.542	7.553	7.564	7.575	7.328
PROPOSED LEVELS	6.100	6.100	6.100	6.100	6.100	6.234	6.736	7.238	7.568	7.578	7.588	7.450
LEVEL DIFFERENCE	-1.244	-1.279	-1.307	-1.334	-1.361	-1.258	-0.788	-0.305	0.015	0.014	0.013	0.123

SECTION A-A
SCALE: H 1:100,V 1:100. DATUM: 4.000



CHAINAGE	00.000	02.000	04.000	06.000	08.000	10.000	12.000	14.000	16.000	18.000	20.000	22.000	24.000	26.000	28.000	30.000
EXISTING LEVELS	6.939	6.954	6.969	6.983	6.998	7.018	7.056	7.089	7.117	7.145	7.173	7.203	7.236	7.270	7.307	7.344
PROPOSED LEVELS	7.331	7.342	7.352	7.248	6.760	6.275	6.100	6.100	6.100	6.100	6.100	6.100	6.100	6.100	6.100	6.100
LEVEL DIFFERENCE	0.392	0.388	0.383	0.264	-0.239	-0.743	-0.956	-0.989	-1.017	-1.045	-1.073	-1.103	-1.136	-1.170	-1.207	-1.244

CHAINAGE	32.000	34.000	36.000	38.000	40.000	42.000	44.000	46.000	48.000	50.000
EXISTING LEVELS	7.379	7.407	7.434	7.461	7.492	7.524	7.542	7.553	7.564	7.575
PROPOSED LEVELS	6.100	6.100	6.100	6.100	6.234	6.736	7.238	7.568	7.578	7.588
LEVEL DIFFERENCE	-1.279	-1.307	-1.334	-1.361	-1.258	-0.788	-0.305	0.015	0.014	0.013

SECTION B-B
SCALE: H 1:100,V 1:100. DATUM: 4.000

NOTES

1. DO NOT SCALE FROM THIS DRAWING. WORK FROM FIGURED DIMENSIONS ONLY.
2. ALL DIMENSIONS SHOWN ON THIS DRAWING ARE IN METRES.
3. ALL DIMENSIONS, LEVELS AND SURVEY GRID CO-ORDINATES ARE TO BE CHECKED ON SITE AND THE ENGINEER NOTIFIED IMMEDIATELY OF ANY DISCREPANCIES PRIOR TO THE COMMENCEMENT OF THE WORKS.
4. BASIN SIDE SLOPES TO FALL AT A MAXIMUM GRADIENT OF 1 IN 4. SLOPES/EMBANKMENT SUBJECT TO A GEOTECHNICAL ASSESSMENT.
5. CONTOUR SHOWN ON THIS DRAWING ARE AT 100mm VERTICAL INTERVALS.
6. TOPOGRAPHICAL SURVEY TAKEN FROM MK SURVEYS DRAWING 26436.
7. ODYSSEY ACCEPT NO LIABILITY FOR THE ACCURACY OF SURVEY INFORMATION AND LAYOUTS SUPPLIED BY OTHERS.
8. THIS DRAWING IS BASED ON THE PLANNING LAYOUT PROVIDED BY GEOFF PERRY ASSOCIATES. DRAWING REFERENCE A855-42A.

LEGEND

- DEVELOPMENT BOUNDARY
- TYPE B SURFACE WATER CATCHPIT
- TYPE 3 SURFACE WATER INSPECTION CHAMBER
- PRIVATE SURACE WATER DRAIN
- PROPOSED CELLULAR SOAKAWAY
- -1:4 PROPOSED GRADIENT
- PROPOSED CONTOURS (SEE NOTE 5)
- 00 SECTION CUTLINE AND CHAINAGE
- EXISTING GROUND PROFILE
- PROPOSED GROUND PROFILE

FOR PLANNING PURPOSES ONLY

Rev	Amendments	Drn	Chk	App	Date
A	SECTIONS UPDATED TO SUIT ARUN DC COMMENTS	SG	LH	LH	19.02.21

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Job Title
FORD LANE,
YAPTON

Drawing Title
BASIN SECTIONS

Client
REDROW

Scale	Date	Designed
AS SHOWN @ A1	JAN 21	LP
Drawn	Checked	Approved
SG	LH	LH
Job No	Drawing No	Rev
18-344	18-344/113	A

P:\18-344 - Ford Lane, Yapton\Tech\Acad\Drawings\100 Series (RM)\18-344-113 Basin Sections.dwg

ARUN DISTRICT COUNCIL Y/0/21/DOC

APPENDIX G

Windes Calculations

Summary of Results for 10 year Return Period (+40%)

Half Drain Time : 469 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	0.134	0.134	0.0	0.5	O K
30 min Summer	0.159	0.159	0.0	0.7	O K
60 min Summer	0.184	0.184	0.0	0.9	O K
120 min Summer	0.209	0.209	0.0	1.2	O K
180 min Summer	0.222	0.222	0.0	1.3	O K
240 min Summer	0.230	0.230	0.0	1.4	O K
360 min Summer	0.240	0.240	0.0	1.6	O K
480 min Summer	0.246	0.246	0.0	1.6	O K
600 min Summer	0.250	0.250	0.0	1.7	O K
720 min Summer	0.254	0.254	0.0	1.7	O K
960 min Summer	0.251	0.251	0.0	1.7	O K
1440 min Summer	0.244	0.244	0.0	1.6	O K
2160 min Summer	0.233	0.233	0.0	1.5	O K
2880 min Summer	0.221	0.221	0.0	1.3	O K
4320 min Summer	0.209	0.209	0.0	1.2	O K
5760 min Summer	0.198	0.198	0.0	1.1	O K
7200 min Summer	0.187	0.187	0.0	0.9	O K
8640 min Summer	0.178	0.178	0.0	0.9	O K
10080 min Summer	0.169	0.169	0.0	0.8	O K
15 min Winter	0.147	0.147	0.0	0.6	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	72.148	0.0	19
30 min Summer	45.463	0.0	33
60 min Summer	28.648	0.0	64
120 min Summer	18.052	0.0	122
180 min Summer	13.779	0.0	182
240 min Summer	11.375	0.0	240
360 min Summer	8.683	0.0	336
480 min Summer	7.168	0.0	392
600 min Summer	6.178	0.0	454
720 min Summer	5.471	0.0	520
960 min Summer	4.332	0.0	654
1440 min Summer	3.118	0.0	924
2160 min Summer	2.244	0.0	1336
2880 min Summer	1.777	0.0	1728
4320 min Summer	1.363	0.0	2508
5760 min Summer	1.130	0.0	3240
7200 min Summer	0.977	0.0	3968
8640 min Summer	0.867	0.0	4752
10080 min Summer	0.784	0.0	5448
15 min Winter	72.148	0.0	19

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Summary of Results for 10 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	0.172	0.172	0.0	0.8	O K
60 min Winter	0.199	0.199	0.0	1.1	O K
120 min Winter	0.225	0.225	0.0	1.4	O K
180 min Winter	0.239	0.239	0.0	1.5	O K
240 min Winter	0.248	0.248	0.0	1.7	O K
360 min Winter	0.259	0.259	0.0	1.8	O K
480 min Winter	0.264	0.264	0.0	1.9	O K
600 min Winter	0.268	0.268	0.0	1.9	O K
720 min Winter	0.271	0.271	0.0	2.0	O K
960 min Winter	0.267	0.267	0.0	1.9	O K
1440 min Winter	0.257	0.257	0.0	1.8	O K
2160 min Winter	0.239	0.239	0.0	1.5	O K
2880 min Winter	0.223	0.223	0.0	1.3	O K
4320 min Winter	0.204	0.204	0.0	1.1	O K
5760 min Winter	0.187	0.187	0.0	0.9	O K
7200 min Winter	0.172	0.172	0.0	0.8	O K
8640 min Winter	0.159	0.159	0.0	0.7	O K
10080 min Winter	0.148	0.148	0.0	0.6	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
30 min Winter	45.463	0.0	33
60 min Winter	28.648	0.0	62
120 min Winter	18.052	0.0	120
180 min Winter	13.779	0.0	178
240 min Winter	11.375	0.0	234
360 min Winter	8.683	0.0	344
480 min Winter	7.168	0.0	442
600 min Winter	6.178	0.0	476
720 min Winter	5.471	0.0	552
960 min Winter	4.332	0.0	704
1440 min Winter	3.118	0.0	1008
2160 min Winter	2.244	0.0	1428
2880 min Winter	1.777	0.0	1844
4320 min Winter	1.363	0.0	2636
5760 min Winter	1.130	0.0	3400
7200 min Winter	0.977	0.0	4112
8640 min Winter	0.867	0.0	4848
10080 min Winter	0.784	0.0	5552

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Rainfall Details

Rainfall Model	FEH
Return Period (years)	10
FEH Rainfall Version	1999
Site Location	GB 498650 101750 SU 98650 01750
C (1km)	-0.025
D1 (1km)	0.390
D2 (1km)	0.245
D3 (1km)	0.403
E (1km)	0.310
F (1km)	2.321
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) 0.006

Time (mins) From:	To:	Area (ha)
0	4	0.006

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Model Details

Storage is Online Cover Level (m) 1.000

Porous Car Park Structure

Infiltration Coefficient Base (m/hr)	0.00612	Width (m)	3.0
Membrane Percolation (mm/hr)	1000	Length (m)	21.0
Max Percolation (l/s)	17.5	Slope (1:X)	60.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	0.000	Membrane Depth (m)	260

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

Half Drain Time : 717 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	0.235	0.235	0.0	1.5	O K
30 min Summer	0.261	0.261	0.0	1.8	O K
60 min Summer	0.289	0.289	0.0	2.3	O K
120 min Summer	0.316	0.316	0.0	2.7	O K
180 min Summer	0.331	0.331	0.1	3.0	O K
240 min Summer	0.341	0.341	0.1	3.1	O K
360 min Summer	0.351	0.351	0.1	3.3	O K
480 min Summer	0.357	0.357	0.1	3.4	O K
600 min Summer	0.360	0.360	0.1	3.5	O K
720 min Summer	0.363	0.363	0.1	3.5	O K
960 min Summer	0.356	0.356	0.1	3.4	O K
1440 min Summer	0.344	0.344	0.1	3.2	O K
2160 min Summer	0.326	0.326	0.0	2.9	O K
2880 min Summer	0.310	0.310	0.0	2.6	O K
4320 min Summer	0.294	0.294	0.0	2.3	O K
5760 min Summer	0.279	0.279	0.0	2.1	O K
7200 min Summer	0.265	0.265	0.0	1.9	O K
8640 min Summer	0.252	0.252	0.0	1.7	O K
10080 min Summer	0.240	0.240	0.0	1.6	O K
15 min Winter	0.251	0.251	0.0	1.7	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	162.161	0.0	19
30 min Summer	98.106	0.0	34
60 min Summer	59.354	0.0	64
120 min Summer	35.909	0.0	122
180 min Summer	26.763	0.0	182
240 min Summer	21.725	0.0	242
360 min Summer	16.191	0.0	360
480 min Summer	13.143	0.0	466
600 min Summer	11.180	0.0	516
720 min Summer	9.796	0.0	578
960 min Summer	7.627	0.0	694
1440 min Summer	5.360	0.0	966
2160 min Summer	3.767	0.0	1368
2880 min Summer	2.933	0.0	1784
4320 min Summer	2.197	0.0	2552
5760 min Summer	1.790	0.0	3344
7200 min Summer	1.527	0.0	4104
8640 min Summer	1.341	0.0	4840
10080 min Summer	1.202	0.0	5552
15 min Winter	162.161	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	0.279	0.279	0.0	2.1	O K
60 min Winter	0.309	0.309	0.0	2.6	O K
120 min Winter	0.338	0.338	0.1	3.1	O K
180 min Winter	0.354	0.354	0.1	3.4	O K
240 min Winter	0.365	0.365	0.1	3.6	O K
360 min Winter	0.378	0.378	0.1	3.8	O K
480 min Winter	0.386	0.386	0.1	4.0	O K
600 min Winter	0.390	0.390	0.1	4.1	O K
720 min Winter	0.392	0.392	0.1	4.1	O K
960 min Winter	0.382	0.382	0.1	3.9	O K
1440 min Winter	0.365	0.365	0.1	3.6	O K
2160 min Winter	0.341	0.341	0.1	3.1	O K
2880 min Winter	0.319	0.319	0.0	2.7	O K
4320 min Winter	0.295	0.295	0.0	2.3	O K
5760 min Winter	0.272	0.272	0.0	2.0	O K
7200 min Winter	0.252	0.252	0.0	1.7	O K
8640 min Winter	0.235	0.235	0.0	1.5	O K
10080 min Winter	0.219	0.219	0.0	1.3	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
30 min Winter	98.106	0.0	33
60 min Winter	59.354	0.0	62
120 min Winter	35.909	0.0	120
180 min Winter	26.763	0.0	178
240 min Winter	21.725	0.0	236
360 min Winter	16.191	0.0	350
480 min Winter	13.143	0.0	462
600 min Winter	11.180	0.0	570
720 min Winter	9.796	0.0	672
960 min Winter	7.627	0.0	750
1440 min Winter	5.360	0.0	1052
2160 min Winter	3.767	0.0	1488
2880 min Winter	2.933	0.0	1904
4320 min Winter	2.197	0.0	2724
5760 min Winter	1.790	0.0	3512
7200 min Winter	1.527	0.0	4256
8640 min Winter	1.341	0.0	5016
10080 min Winter	1.202	0.0	5752

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Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	1999
Site Location	GB 498650 101750 SU 98650 01750
C (1km)	-0.025
D1 (1km)	0.390
D2 (1km)	0.245
D3 (1km)	0.403
E (1km)	0.310
F (1km)	2.321
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) 0.006

Time (mins) From:	To:	Area (ha)
0	4	0.006

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Model Details

Storage is Online Cover Level (m) 1.000

Porous Car Park Structure

Infiltration Coefficient Base (m/hr)	0.00612	Width (m)	3.0
Membrane Percolation (mm/hr)	1000	Length (m)	21.0
Max Percolation (l/s)	17.5	Slope (1:X)	60.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	0.000	Membrane Depth (m)	260

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Summary of Results for 10 year Return Period (+40%)

Half Drain Time : 1183 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	0.156	0.156	0.0	0.3	O K
30 min Summer	0.185	0.185	0.0	0.5	O K
60 min Summer	0.216	0.216	0.0	0.6	O K
120 min Summer	0.247	0.247	0.0	0.8	O K
180 min Summer	0.266	0.266	0.0	1.0	O K
240 min Summer	0.279	0.279	0.0	1.1	O K
360 min Summer	0.297	0.297	0.0	1.2	O K
480 min Summer	0.308	0.308	0.0	1.3	O K
600 min Summer	0.316	0.316	0.0	1.3	O K
720 min Summer	0.322	0.322	0.0	1.4	O K
960 min Summer	0.321	0.321	0.0	1.4	O K
1440 min Summer	0.319	0.319	0.0	1.4	O K
2160 min Summer	0.314	0.314	0.0	1.3	O K
2880 min Summer	0.308	0.308	0.0	1.3	O K
4320 min Summer	0.308	0.308	0.0	1.3	O K
5760 min Summer	0.304	0.304	0.0	1.2	O K
7200 min Summer	0.298	0.298	0.0	1.2	O K
8640 min Summer	0.291	0.291	0.0	1.1	O K
10080 min Summer	0.285	0.285	0.0	1.1	O K
15 min Winter	0.170	0.170	0.0	0.4	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	72.148	0.0	19
30 min Summer	45.463	0.0	34
60 min Summer	28.648	0.0	64
120 min Summer	18.052	0.0	124
180 min Summer	13.779	0.0	182
240 min Summer	11.375	0.0	242
360 min Summer	8.683	0.0	362
480 min Summer	7.168	0.0	482
600 min Summer	6.178	0.0	600
720 min Summer	5.471	0.0	720
960 min Summer	4.332	0.0	838
1440 min Summer	3.118	0.0	1082
2160 min Summer	2.244	0.0	1472
2880 min Summer	1.777	0.0	1900
4320 min Summer	1.363	0.0	2724
5760 min Summer	1.130	0.0	3520
7200 min Summer	0.977	0.0	4328
8640 min Summer	0.867	0.0	5104
10080 min Summer	0.784	0.0	5856
15 min Winter	72.148	0.0	19

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Summary of Results for 10 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	0.0	0.5	O K
60 min Winter	0.233	0.233	0.0	0.7	O K
120 min Winter	0.266	0.266	0.0	1.0	O K
180 min Winter	0.286	0.286	0.0	1.1	O K
240 min Winter	0.299	0.299	0.0	1.2	O K
360 min Winter	0.318	0.318	0.0	1.4	O K
480 min Winter	0.331	0.331	0.0	1.5	O K
600 min Winter	0.339	0.339	0.0	1.6	O K
720 min Winter	0.346	0.346	0.0	1.6	O K
960 min Winter	0.345	0.345	0.0	1.6	O K
1440 min Winter	0.341	0.341	0.0	1.6	O K
2160 min Winter	0.334	0.334	0.0	1.5	O K
2880 min Winter	0.326	0.326	0.0	1.4	O K
4320 min Winter	0.320	0.320	0.0	1.4	O K
5760 min Winter	0.311	0.311	0.0	1.3	O K
7200 min Winter	0.301	0.301	0.0	1.2	O K
8640 min Winter	0.290	0.290	0.0	1.1	O K
10080 min Winter	0.280	0.280	0.0	1.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
30 min Winter	45.463	0.0	33
60 min Winter	28.648	0.0	62
120 min Winter	18.052	0.0	122
180 min Winter	13.779	0.0	180
240 min Winter	11.375	0.0	238
360 min Winter	8.683	0.0	354
480 min Winter	7.168	0.0	470
600 min Winter	6.178	0.0	584
720 min Winter	5.471	0.0	694
960 min Winter	4.332	0.0	906
1440 min Winter	3.118	0.0	1138
2160 min Winter	2.244	0.0	1596
2880 min Winter	1.777	0.0	2048
4320 min Winter	1.363	0.0	2936
5760 min Winter	1.130	0.0	3800
7200 min Winter	0.977	0.0	4608
8640 min Winter	0.867	0.0	5440
10080 min Winter	0.784	0.0	6160

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Rainfall Details

Rainfall Model	FEH
Return Period (years)	10
FEH Rainfall Version	1999
Site Location	GB 498650 101750 SU 98650 01750
C (1km)	-0.025
D1 (1km)	0.390
D2 (1km)	0.245
D3 (1km)	0.403
E (1km)	0.310
F (1km)	2.321
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) 0.004

Time (mins) From:	To:	Area (ha)
0	4	0.004

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Model Details

Storage is Online Cover Level (m) 1.000

Porous Car Park Structure

Infiltration Coefficient Base (m/hr)	0.00310	Width (m)	3.0
Membrane Percolation (mm/hr)	1000	Length (m)	14.0
Max Percolation (l/s)	11.7	Slope (1:X)	30.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	0.000	Membrane Depth (m)	260

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

Half Drain Time : 1702 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	0.272	0.272	0.0	1.0	O K
30 min Summer	0.304	0.304	0.0	1.2	O K
60 min Summer	0.338	0.338	0.0	1.5	O K
120 min Summer	0.373	0.373	0.0	1.9	O K
180 min Summer	0.393	0.393	0.0	2.1	O K
240 min Summer	0.408	0.408	0.0	2.2	O K
360 min Summer	0.428	0.428	0.0	2.5	O K
480 min Summer	0.440	0.440	0.0	2.6	O K
600 min Summer	0.449	0.449	0.0	2.7	O K
720 min Summer	0.456	0.456	0.0	2.8	O K
960 min Summer	0.453	0.453	0.0	2.8	O K
1440 min Summer	0.444	0.444	0.0	2.7	O K
2160 min Summer	0.433	0.433	0.0	2.5	O K
2880 min Summer	0.423	0.423	0.0	2.4	O K
4320 min Summer	0.420	0.420	0.0	2.4	O K
5760 min Summer	0.414	0.414	0.0	2.3	O K
7200 min Summer	0.406	0.406	0.0	2.2	O K
8640 min Summer	0.397	0.397	0.0	2.1	O K
10080 min Summer	0.388	0.388	0.0	2.0	O K
15 min Winter	0.291	0.291	0.0	1.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	162.161	0.0	19
30 min Summer	98.106	0.0	34
60 min Summer	59.354	0.0	64
120 min Summer	35.909	0.0	124
180 min Summer	26.763	0.0	184
240 min Summer	21.725	0.0	242
360 min Summer	16.191	0.0	362
480 min Summer	13.143	0.0	482
600 min Summer	11.180	0.0	602
720 min Summer	9.796	0.0	722
960 min Summer	7.627	0.0	960
1440 min Summer	5.360	0.0	1210
2160 min Summer	3.767	0.0	1560
2880 min Summer	2.933	0.0	1964
4320 min Summer	2.197	0.0	2808
5760 min Summer	1.790	0.0	3632
7200 min Summer	1.527	0.0	4464
8640 min Summer	1.341	0.0	5264
10080 min Summer	1.202	0.0	6048
15 min Winter	162.161	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	0.325	0.325	0.0	1.4	O K
60 min Winter	0.360	0.360	0.0	1.7	O K
120 min Winter	0.397	0.397	0.0	2.1	O K
180 min Winter	0.419	0.419	0.0	2.4	O K
240 min Winter	0.435	0.435	0.0	2.6	O K
360 min Winter	0.456	0.456	0.0	2.8	O K
480 min Winter	0.470	0.470	0.0	3.0	O K
600 min Winter	0.480	0.480	0.0	3.1	O K
720 min Winter	0.488	0.488	0.0	3.2	O K
960 min Winter	0.486	0.486	0.0	3.2	O K
1440 min Winter	0.477	0.477	0.0	3.1	O K
2160 min Winter	0.463	0.463	0.0	2.9	O K
2880 min Winter	0.450	0.450	0.0	2.7	O K
4320 min Winter	0.442	0.442	0.0	2.6	O K
5760 min Winter	0.431	0.431	0.0	2.5	O K
7200 min Winter	0.418	0.418	0.0	2.4	O K
8640 min Winter	0.404	0.404	0.0	2.2	O K
10080 min Winter	0.391	0.391	0.0	2.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
30 min Winter	98.106	0.0	34
60 min Winter	59.354	0.0	64
120 min Winter	35.909	0.0	122
180 min Winter	26.763	0.0	180
240 min Winter	21.725	0.0	240
360 min Winter	16.191	0.0	356
480 min Winter	13.143	0.0	472
600 min Winter	11.180	0.0	590
720 min Winter	9.796	0.0	702
960 min Winter	7.627	0.0	926
1440 min Winter	5.360	0.0	1354
2160 min Winter	3.767	0.0	1664
2880 min Winter	2.933	0.0	2132
4320 min Winter	2.197	0.0	3028
5760 min Winter	1.790	0.0	3920
7200 min Winter	1.527	0.0	4760
8640 min Winter	1.341	0.0	5616
10080 min Winter	1.202	0.0	6448

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Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	1999
Site Location	GB 498650 101750 SU 98650 01750
C (1km)	-0.025
D1 (1km)	0.390
D2 (1km)	0.245
D3 (1km)	0.403
E (1km)	0.310
F (1km)	2.321
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) 0.004

Time (mins) From:	To:	Area (ha)
0	4	0.004

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Model Details

Storage is Online Cover Level (m) 1.000

Porous Car Park Structure

Infiltration Coefficient Base (m/hr)	0.00310	Width (m)	3.0
Membrane Percolation (mm/hr)	1000	Length (m)	14.0
Max Percolation (l/s)	11.7	Slope (1:X)	30.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	0.000	Membrane Depth (m)	260

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Summary of Results for 10 year Return Period (+40%)

Half Drain Time : 217 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	0.091	0.091	0.0	0.4	O K
30 min Summer	0.105	0.105	0.0	0.6	O K
60 min Summer	0.119	0.119	0.1	0.8	O K
120 min Summer	0.132	0.132	0.1	0.9	O K
180 min Summer	0.138	0.138	0.1	1.0	O K
240 min Summer	0.142	0.142	0.1	1.1	O K
360 min Summer	0.148	0.148	0.1	1.1	O K
480 min Summer	0.151	0.151	0.1	1.2	O K
600 min Summer	0.152	0.152	0.1	1.2	O K
720 min Summer	0.152	0.152	0.1	1.2	O K
960 min Summer	0.145	0.145	0.1	1.1	O K
1440 min Summer	0.130	0.130	0.1	0.9	O K
2160 min Summer	0.114	0.114	0.1	0.7	O K
2880 min Summer	0.103	0.103	0.0	0.6	O K
4320 min Summer	0.091	0.091	0.0	0.4	O K
5760 min Summer	0.081	0.081	0.0	0.4	O K
7200 min Summer	0.074	0.074	0.0	0.3	O K
8640 min Summer	0.068	0.068	0.0	0.2	O K
10080 min Summer	0.063	0.063	0.0	0.2	O K
15 min Winter	0.098	0.098	0.0	0.5	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	72.148	0.0	18
30 min Summer	45.463	0.0	33
60 min Summer	28.648	0.0	62
120 min Summer	18.052	0.0	120
180 min Summer	13.779	0.0	162
240 min Summer	11.375	0.0	194
360 min Summer	8.683	0.0	260
480 min Summer	7.168	0.0	330
600 min Summer	6.178	0.0	402
720 min Summer	5.471	0.0	470
960 min Summer	4.332	0.0	606
1440 min Summer	3.118	0.0	864
2160 min Summer	2.244	0.0	1228
2880 min Summer	1.777	0.0	1588
4320 min Summer	1.363	0.0	2332
5760 min Summer	1.130	0.0	3048
7200 min Summer	0.977	0.0	3752
8640 min Summer	0.867	0.0	4488
10080 min Summer	0.784	0.0	5152
15 min Winter	72.148	0.0	18

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Summary of Results for 10 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	0.113	0.113	0.1	0.7	O K
60 min Winter	0.128	0.128	0.1	0.9	O K
120 min Winter	0.144	0.144	0.1	1.1	O K
180 min Winter	0.152	0.152	0.1	1.2	O K
240 min Winter	0.156	0.156	0.1	1.2	O K
360 min Winter	0.161	0.161	0.1	1.3	O K
480 min Winter	0.163	0.163	0.1	1.3	O K
600 min Winter	0.163	0.163	0.1	1.3	O K
720 min Winter	0.162	0.162	0.1	1.3	O K
960 min Winter	0.151	0.151	0.1	1.2	O K
1440 min Winter	0.130	0.130	0.1	0.9	O K
2160 min Winter	0.109	0.109	0.0	0.6	O K
2880 min Winter	0.094	0.094	0.0	0.5	O K
4320 min Winter	0.078	0.078	0.0	0.3	O K
5760 min Winter	0.067	0.067	0.0	0.2	O K
7200 min Winter	0.059	0.059	0.0	0.2	O K
8640 min Winter	0.053	0.053	0.0	0.1	O K
10080 min Winter	0.049	0.049	0.0	0.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
30 min Winter	45.463	0.0	32
60 min Winter	28.648	0.0	60
120 min Winter	18.052	0.0	118
180 min Winter	13.779	0.0	174
240 min Winter	11.375	0.0	224
360 min Winter	8.683	0.0	282
480 min Winter	7.168	0.0	360
600 min Winter	6.178	0.0	438
720 min Winter	5.471	0.0	514
960 min Winter	4.332	0.0	656
1440 min Winter	3.118	0.0	912
2160 min Winter	2.244	0.0	1276
2880 min Winter	1.777	0.0	1644
4320 min Winter	1.363	0.0	2376
5760 min Winter	1.130	0.0	3056
7200 min Winter	0.977	0.0	3752
8640 min Winter	0.867	0.0	4488
10080 min Winter	0.784	0.0	5136

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Rainfall Details

Rainfall Model	FEH
Return Period (years)	10
FEH Rainfall Version	1999
Site Location	GB 498650 101750 SU 98650 01750
C (1km)	-0.025
D1 (1km)	0.390
D2 (1km)	0.245
D3 (1km)	0.403
E (1km)	0.310
F (1km)	2.321
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) 0.005

Time (mins) From:	To:	Area (ha)
0	4	0.005

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Model Details

Storage is Online Cover Level (m) 1.000

Porous Car Park Structure

Infiltration Coefficient Base (m/hr)	0.00900	Width (m)	6.0
Membrane Percolation (mm/hr)	1000	Length (m)	7.0
Max Percolation (l/s)	11.7	Slope (1:X)	60.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	0.000	Membrane Depth (m)	260

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

Half Drain Time : 496 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	0.159	0.159	0.1	1.3	O K
30 min Summer	0.182	0.182	0.1	1.6	O K
60 min Summer	0.208	0.208	0.1	1.9	O K
120 min Summer	0.234	0.234	0.1	2.2	O K
180 min Summer	0.249	0.249	0.1	2.4	O K
240 min Summer	0.257	0.257	0.1	2.5	O K
360 min Summer	0.265	0.265	0.1	2.6	O K
480 min Summer	0.268	0.268	0.1	2.6	O K
600 min Summer	0.269	0.269	0.1	2.7	O K
720 min Summer	0.269	0.269	0.1	2.7	O K
960 min Summer	0.255	0.255	0.1	2.5	O K
1440 min Summer	0.229	0.229	0.1	2.1	O K
2160 min Summer	0.196	0.196	0.1	1.7	O K
2880 min Summer	0.169	0.169	0.1	1.4	O K
4320 min Summer	0.141	0.141	0.1	1.0	O K
5760 min Summer	0.121	0.121	0.1	0.8	O K
7200 min Summer	0.109	0.109	0.0	0.6	O K
8640 min Summer	0.100	0.100	0.0	0.5	O K
10080 min Summer	0.093	0.093	0.0	0.5	O K
15 min Winter	0.174	0.174	0.1	1.5	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	162.161	0.0	19
30 min Summer	98.106	0.0	33
60 min Summer	59.354	0.0	62
120 min Summer	35.909	0.0	122
180 min Summer	26.763	0.0	182
240 min Summer	21.725	0.0	242
360 min Summer	16.191	0.0	360
480 min Summer	13.143	0.0	416
600 min Summer	11.180	0.0	478
720 min Summer	9.796	0.0	542
960 min Summer	7.627	0.0	672
1440 min Summer	5.360	0.0	938
2160 min Summer	3.767	0.0	1324
2880 min Summer	2.933	0.0	1704
4320 min Summer	2.197	0.0	2424
5760 min Summer	1.790	0.0	3112
7200 min Summer	1.527	0.0	3816
8640 min Summer	1.341	0.0	4504
10080 min Summer	1.202	0.0	5248
15 min Winter	162.161	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	0.200	0.200	0.1	1.8	O K
60 min Winter	0.229	0.229	0.1	2.1	O K
120 min Winter	0.259	0.259	0.1	2.5	O K
180 min Winter	0.276	0.276	0.1	2.7	O K
240 min Winter	0.287	0.287	0.1	2.9	O K
360 min Winter	0.298	0.298	0.1	3.0	O K
480 min Winter	0.303	0.303	0.1	3.1	O K
600 min Winter	0.303	0.303	0.1	3.1	O K
720 min Winter	0.301	0.301	0.1	3.1	O K
960 min Winter	0.283	0.283	0.1	2.8	O K
1440 min Winter	0.248	0.248	0.1	2.4	O K
2160 min Winter	0.200	0.200	0.1	1.8	O K
2880 min Winter	0.161	0.161	0.1	1.3	O K
4320 min Winter	0.121	0.121	0.1	0.8	O K
5760 min Winter	0.104	0.104	0.0	0.6	O K
7200 min Winter	0.091	0.091	0.0	0.4	O K
8640 min Winter	0.081	0.081	0.0	0.4	O K
10080 min Winter	0.073	0.073	0.0	0.3	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
30 min Winter	98.106	0.0	33
60 min Winter	59.354	0.0	62
120 min Winter	35.909	0.0	120
180 min Winter	26.763	0.0	178
240 min Winter	21.725	0.0	236
360 min Winter	16.191	0.0	348
480 min Winter	13.143	0.0	458
600 min Winter	11.180	0.0	558
720 min Winter	9.796	0.0	580
960 min Winter	7.627	0.0	724
1440 min Winter	5.360	0.0	1024
2160 min Winter	3.767	0.0	1428
2880 min Winter	2.933	0.0	1812
4320 min Winter	2.197	0.0	2464
5760 min Winter	1.790	0.0	3168
7200 min Winter	1.527	0.0	3888
8640 min Winter	1.341	0.0	4576
10080 min Winter	1.202	0.0	5248

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Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	1999
Site Location	GB 498650 101750 SU 98650 01750
C (1km)	-0.025
D1 (1km)	0.390
D2 (1km)	0.245
D3 (1km)	0.403
E (1km)	0.310
F (1km)	2.321
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) 0.005

Time (mins) From:	To:	Area (ha)
0	4	0.005

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Model Details

Storage is Online Cover Level (m) 1.000

Porous Car Park Structure

Infiltration Coefficient Base (m/hr)	0.00900	Width (m)	6.0
Membrane Percolation (mm/hr)	1000	Length (m)	7.0
Max Percolation (l/s)	11.7	Slope (1:X)	60.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	0.000	Membrane Depth (m)	260

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Summary of Results for 10 year Return Period (+40%)

Half Drain Time : 414 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	0.112	0.112	0.0	0.5	O K
30 min Summer	0.131	0.131	0.0	0.6	O K
60 min Summer	0.149	0.149	0.0	0.8	O K
120 min Summer	0.167	0.167	0.0	1.0	O K
180 min Summer	0.176	0.176	0.0	1.1	O K
240 min Summer	0.182	0.182	0.0	1.2	O K
360 min Summer	0.189	0.189	0.0	1.3	O K
480 min Summer	0.194	0.194	0.0	1.3	O K
600 min Summer	0.197	0.197	0.0	1.4	O K
720 min Summer	0.200	0.200	0.0	1.4	O K
960 min Summer	0.196	0.196	0.0	1.4	O K
1440 min Summer	0.187	0.187	0.0	1.3	O K
2160 min Summer	0.174	0.174	0.0	1.1	O K
2880 min Summer	0.163	0.163	0.0	1.0	O K
4320 min Summer	0.151	0.151	0.0	0.8	O K
5760 min Summer	0.141	0.141	0.0	0.7	O K
7200 min Summer	0.132	0.132	0.0	0.6	O K
8640 min Summer	0.124	0.124	0.0	0.6	O K
10080 min Summer	0.117	0.117	0.0	0.5	O K
15 min Winter	0.122	0.122	0.0	0.5	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	72.148	0.0	19
30 min Summer	45.463	0.0	33
60 min Summer	28.648	0.0	62
120 min Summer	18.052	0.0	122
180 min Summer	13.779	0.0	180
240 min Summer	11.375	0.0	240
360 min Summer	8.683	0.0	306
480 min Summer	7.168	0.0	372
600 min Summer	6.178	0.0	438
720 min Summer	5.471	0.0	506
960 min Summer	4.332	0.0	644
1440 min Summer	3.118	0.0	910
2160 min Summer	2.244	0.0	1300
2880 min Summer	1.777	0.0	1696
4320 min Summer	1.363	0.0	2460
5760 min Summer	1.130	0.0	3176
7200 min Summer	0.977	0.0	3896
8640 min Summer	0.867	0.0	4664
10080 min Summer	0.784	0.0	5352
15 min Winter	72.148	0.0	18

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Summary of Results for 10 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	0.141	0.141	0.0	0.7	O K
60 min Winter	0.160	0.160	0.0	0.9	O K
120 min Winter	0.179	0.179	0.0	1.2	O K
180 min Winter	0.190	0.190	0.0	1.3	O K
240 min Winter	0.197	0.197	0.0	1.4	O K
360 min Winter	0.206	0.206	0.0	1.5	O K
480 min Winter	0.210	0.210	0.0	1.5	O K
600 min Winter	0.214	0.214	0.0	1.6	O K
720 min Winter	0.216	0.216	0.0	1.6	O K
960 min Winter	0.210	0.210	0.0	1.5	O K
1440 min Winter	0.196	0.196	0.0	1.4	O K
2160 min Winter	0.176	0.176	0.0	1.1	O K
2880 min Winter	0.161	0.161	0.0	0.9	O K
4320 min Winter	0.144	0.144	0.0	0.7	O K
5760 min Winter	0.129	0.129	0.0	0.6	O K
7200 min Winter	0.117	0.117	0.0	0.5	O K
8640 min Winter	0.107	0.107	0.0	0.4	O K
10080 min Winter	0.099	0.099	0.0	0.3	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
30 min Winter	45.463	0.0	33
60 min Winter	28.648	0.0	62
120 min Winter	18.052	0.0	120
180 min Winter	13.779	0.0	176
240 min Winter	11.375	0.0	232
360 min Winter	8.683	0.0	342
480 min Winter	7.168	0.0	430
600 min Winter	6.178	0.0	472
720 min Winter	5.471	0.0	550
960 min Winter	4.332	0.0	702
1440 min Winter	3.118	0.0	994
2160 min Winter	2.244	0.0	1384
2880 min Winter	1.777	0.0	1784
4320 min Winter	1.363	0.0	2552
5760 min Winter	1.130	0.0	3288
7200 min Winter	0.977	0.0	4032
8640 min Winter	0.867	0.0	4752
10080 min Winter	0.784	0.0	5448

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Rainfall Details

Rainfall Model	FEH
Return Period (years)	10
FEH Rainfall Version	1999
Site Location	GB 498650 101750 SU 98650 01750
C (1km)	-0.025
D1 (1km)	0.390
D2 (1km)	0.245
D3 (1km)	0.403
E (1km)	0.310
F (1km)	2.321
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) 0.005

Time (mins) From:	To:	Area (ha)
0	4	0.005

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Model Details

Storage is Online Cover Level (m) 1.000

Porous Car Park Structure

Infiltration Coefficient Base (m/hr)	0.00612	Width (m)	6.0
Membrane Percolation (mm/hr)	1000	Length (m)	7.0
Max Percolation (l/s)	11.7	Slope (1:X)	40.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	0.000	Membrane Depth (m)	260

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

Half Drain Time : 835 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	0.190	0.190	0.0	1.3	O K
30 min Summer	0.213	0.213	0.0	1.6	O K
60 min Summer	0.240	0.240	0.0	1.9	O K
120 min Summer	0.270	0.270	0.0	2.3	O K
180 min Summer	0.288	0.288	0.0	2.5	O K
240 min Summer	0.300	0.300	0.0	2.7	O K
360 min Summer	0.316	0.316	0.0	2.9	O K
480 min Summer	0.324	0.324	0.0	3.0	O K
600 min Summer	0.328	0.328	0.0	3.0	O K
720 min Summer	0.331	0.331	0.0	3.1	O K
960 min Summer	0.320	0.320	0.0	2.9	O K
1440 min Summer	0.301	0.301	0.0	2.7	O K
2160 min Summer	0.276	0.276	0.0	2.4	O K
2880 min Summer	0.253	0.253	0.0	2.1	O K
4320 min Summer	0.231	0.231	0.0	1.8	O K
5760 min Summer	0.210	0.210	0.0	1.5	O K
7200 min Summer	0.192	0.192	0.0	1.3	O K
8640 min Summer	0.178	0.178	0.0	1.1	O K
10080 min Summer	0.168	0.168	0.0	1.0	O K
15 min Winter	0.204	0.204	0.0	1.5	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	162.161	0.0	19
30 min Summer	98.106	0.0	34
60 min Summer	59.354	0.0	64
120 min Summer	35.909	0.0	122
180 min Summer	26.763	0.0	182
240 min Summer	21.725	0.0	242
360 min Summer	16.191	0.0	362
480 min Summer	13.143	0.0	480
600 min Summer	11.180	0.0	600
720 min Summer	9.796	0.0	658
960 min Summer	7.627	0.0	760
1440 min Summer	5.360	0.0	1010
2160 min Summer	3.767	0.0	1408
2880 min Summer	2.933	0.0	1812
4320 min Summer	2.197	0.0	2592
5760 min Summer	1.790	0.0	3344
7200 min Summer	1.527	0.0	4040
8640 min Summer	1.341	0.0	4752
10080 min Summer	1.202	0.0	5448
15 min Winter	162.161	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	0.231	0.231	0.0	1.8	O K
60 min Winter	0.261	0.261	0.0	2.2	O K
120 min Winter	0.296	0.296	0.0	2.6	O K
180 min Winter	0.316	0.316	0.0	2.9	O K
240 min Winter	0.331	0.331	0.0	3.1	O K
360 min Winter	0.349	0.349	0.0	3.3	O K
480 min Winter	0.360	0.360	0.0	3.4	O K
600 min Winter	0.367	0.367	0.0	3.5	O K
720 min Winter	0.371	0.371	0.0	3.6	O K
960 min Winter	0.357	0.357	0.0	3.4	O K
1440 min Winter	0.332	0.332	0.0	3.1	O K
2160 min Winter	0.297	0.297	0.0	2.6	O K
2880 min Winter	0.264	0.264	0.0	2.2	O K
4320 min Winter	0.228	0.228	0.0	1.8	O K
5760 min Winter	0.197	0.197	0.0	1.4	O K
7200 min Winter	0.174	0.174	0.0	1.1	O K
8640 min Winter	0.160	0.160	0.0	0.9	O K
10080 min Winter	0.148	0.148	0.0	0.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
30 min Winter	98.106	0.0	33
60 min Winter	59.354	0.0	62
120 min Winter	35.909	0.0	120
180 min Winter	26.763	0.0	180
240 min Winter	21.725	0.0	238
360 min Winter	16.191	0.0	354
480 min Winter	13.143	0.0	468
600 min Winter	11.180	0.0	578
720 min Winter	9.796	0.0	688
960 min Winter	7.627	0.0	886
1440 min Winter	5.360	0.0	1096
2160 min Winter	3.767	0.0	1536
2880 min Winter	2.933	0.0	1960
4320 min Winter	2.197	0.0	2764
5760 min Winter	1.790	0.0	3512
7200 min Winter	1.527	0.0	4112
8640 min Winter	1.341	0.0	4848
10080 min Winter	1.202	0.0	5552

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Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	1999
Site Location	GB 498650 101750 SU 98650 01750
C (1km)	-0.025
D1 (1km)	0.390
D2 (1km)	0.245
D3 (1km)	0.403
E (1km)	0.310
F (1km)	2.321
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) 0.005

Time (mins) From:	To:	Area (ha)
0	4	0.005

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Model Details

Storage is Online Cover Level (m) 1.000

Porous Car Park Structure

Infiltration Coefficient Base (m/hr)	0.00612	Width (m)	6.0
Membrane Percolation (mm/hr)	1000	Length (m)	7.0
Max Percolation (l/s)	11.7	Slope (1:X)	40.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	0.000	Membrane Depth (m)	260

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Summary of Results for 10 year Return Period (+40%)

Half Drain Time : 86 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	0.082	0.082	0.1	0.4	O K
30 min Summer	0.094	0.094	0.1	0.6	O K
60 min Summer	0.103	0.103	0.1	0.7	O K
120 min Summer	0.111	0.111	0.1	0.8	O K
180 min Summer	0.116	0.116	0.1	0.8	O K
240 min Summer	0.118	0.118	0.1	0.9	O K
360 min Summer	0.118	0.118	0.1	0.9	O K
480 min Summer	0.116	0.116	0.1	0.8	O K
600 min Summer	0.113	0.113	0.1	0.8	O K
720 min Summer	0.109	0.109	0.1	0.7	O K
960 min Summer	0.099	0.099	0.1	0.6	O K
1440 min Summer	0.086	0.086	0.1	0.5	O K
2160 min Summer	0.071	0.071	0.1	0.3	O K
2880 min Summer	0.061	0.061	0.1	0.2	O K
4320 min Summer	0.051	0.051	0.1	0.2	O K
5760 min Summer	0.047	0.047	0.0	0.1	O K
7200 min Summer	0.044	0.044	0.0	0.1	O K
8640 min Summer	0.041	0.041	0.0	0.1	O K
10080 min Summer	0.039	0.039	0.0	0.1	O K
15 min Winter	0.089	0.089	0.1	0.5	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	72.148	0.0	18
30 min Summer	45.463	0.0	32
60 min Summer	28.648	0.0	60
120 min Summer	18.052	0.0	92
180 min Summer	13.779	0.0	126
240 min Summer	11.375	0.0	160
360 min Summer	8.683	0.0	230
480 min Summer	7.168	0.0	296
600 min Summer	6.178	0.0	362
720 min Summer	5.471	0.0	426
960 min Summer	4.332	0.0	548
1440 min Summer	3.118	0.0	792
2160 min Summer	2.244	0.0	1148
2880 min Summer	1.777	0.0	1500
4320 min Summer	1.363	0.0	2204
5760 min Summer	1.130	0.0	2936
7200 min Summer	0.977	0.0	3672
8640 min Summer	0.867	0.0	4408
10080 min Summer	0.784	0.0	5136
15 min Winter	72.148	0.0	18

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Summary of Results for 10 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	0.101	0.101	0.1	0.6	O K
60 min Winter	0.113	0.113	0.1	0.8	O K
120 min Winter	0.121	0.121	0.1	0.9	O K
180 min Winter	0.125	0.125	0.1	0.9	O K
240 min Winter	0.126	0.126	0.1	1.0	O K
360 min Winter	0.123	0.123	0.1	0.9	O K
480 min Winter	0.119	0.119	0.1	0.9	O K
600 min Winter	0.113	0.113	0.1	0.8	O K
720 min Winter	0.107	0.107	0.1	0.7	O K
960 min Winter	0.095	0.095	0.1	0.6	O K
1440 min Winter	0.077	0.077	0.1	0.4	O K
2160 min Winter	0.060	0.060	0.1	0.2	O K
2880 min Winter	0.050	0.050	0.0	0.2	O K
4320 min Winter	0.044	0.044	0.0	0.1	O K
5760 min Winter	0.040	0.040	0.0	0.1	O K
7200 min Winter	0.037	0.037	0.0	0.1	O K
8640 min Winter	0.035	0.035	0.0	0.1	O K
10080 min Winter	0.033	0.033	0.0	0.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
30 min Winter	45.463	0.0	31
60 min Winter	28.648	0.0	60
120 min Winter	18.052	0.0	98
180 min Winter	13.779	0.0	136
240 min Winter	11.375	0.0	176
360 min Winter	8.683	0.0	250
480 min Winter	7.168	0.0	320
600 min Winter	6.178	0.0	386
720 min Winter	5.471	0.0	450
960 min Winter	4.332	0.0	568
1440 min Winter	3.118	0.0	810
2160 min Winter	2.244	0.0	1164
2880 min Winter	1.777	0.0	1500
4320 min Winter	1.363	0.0	2204
5760 min Winter	1.130	0.0	2936
7200 min Winter	0.977	0.0	3672
8640 min Winter	0.867	0.0	4392
10080 min Winter	0.784	0.0	5136

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Rainfall Details

Rainfall Model	FEH
Return Period (years)	10
FEH Rainfall Version	1999
Site Location	GB 498650 101750 SU 98650 01750
C (1km)	-0.025
D1 (1km)	0.390
D2 (1km)	0.245
D3 (1km)	0.403
E (1km)	0.310
F (1km)	2.321
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) 0.005

Time (mins) From:	To:	Area (ha)
0	4	0.005

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Model Details

Storage is Online Cover Level (m) 1.000

Porous Car Park Structure

Infiltration Coefficient Base (m/hr)	0.01728	Width (m)	7.0
Membrane Percolation (mm/hr)	1000	Length (m)	6.0
Max Percolation (l/s)	11.7	Slope (1:X)	60.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	0.000	Membrane Depth (m)	260

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

Half Drain Time : 208 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	0.149	0.149	0.1	1.2	O K
30 min Summer	0.170	0.170	0.1	1.5	O K
60 min Summer	0.191	0.191	0.1	1.8	O K
120 min Summer	0.208	0.208	0.1	2.0	O K
180 min Summer	0.213	0.213	0.1	2.0	O K
240 min Summer	0.215	0.215	0.1	2.1	O K
360 min Summer	0.215	0.215	0.1	2.1	O K
480 min Summer	0.212	0.212	0.1	2.0	O K
600 min Summer	0.207	0.207	0.1	2.0	O K
720 min Summer	0.202	0.202	0.1	1.9	O K
960 min Summer	0.181	0.181	0.1	1.6	O K
1440 min Summer	0.146	0.146	0.1	1.2	O K
2160 min Summer	0.111	0.111	0.1	0.8	O K
2880 min Summer	0.093	0.093	0.1	0.5	O K
4320 min Summer	0.077	0.077	0.1	0.4	O K
5760 min Summer	0.066	0.066	0.1	0.3	O K
7200 min Summer	0.058	0.058	0.1	0.2	O K
8640 min Summer	0.052	0.052	0.1	0.2	O K
10080 min Summer	0.049	0.049	0.0	0.1	O K
15 min Winter	0.163	0.163	0.1	1.4	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	162.161	0.0	18
30 min Summer	98.106	0.0	33
60 min Summer	59.354	0.0	62
120 min Summer	35.909	0.0	120
180 min Summer	26.763	0.0	166
240 min Summer	21.725	0.0	194
360 min Summer	16.191	0.0	260
480 min Summer	13.143	0.0	328
600 min Summer	11.180	0.0	398
720 min Summer	9.796	0.0	464
960 min Summer	7.627	0.0	598
1440 min Summer	5.360	0.0	850
2160 min Summer	3.767	0.0	1192
2880 min Summer	2.933	0.0	1528
4320 min Summer	2.197	0.0	2248
5760 min Summer	1.790	0.0	2944
7200 min Summer	1.527	0.0	3672
8640 min Summer	1.341	0.0	4408
10080 min Summer	1.202	0.0	5136
15 min Winter	162.161	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	0.187	0.187	0.1	1.7	O K
60 min Winter	0.211	0.211	0.1	2.0	O K
120 min Winter	0.232	0.232	0.1	2.3	O K
180 min Winter	0.240	0.240	0.1	2.4	O K
240 min Winter	0.241	0.241	0.1	2.4	O K
360 min Winter	0.239	0.239	0.1	2.4	O K
480 min Winter	0.234	0.234	0.1	2.3	O K
600 min Winter	0.227	0.227	0.1	2.2	O K
720 min Winter	0.218	0.218	0.1	2.1	O K
960 min Winter	0.187	0.187	0.1	1.7	O K
1440 min Winter	0.137	0.137	0.1	1.1	O K
2160 min Winter	0.096	0.096	0.1	0.6	O K
2880 min Winter	0.079	0.079	0.1	0.4	O K
4320 min Winter	0.061	0.061	0.1	0.2	O K
5760 min Winter	0.051	0.051	0.1	0.2	O K
7200 min Winter	0.047	0.047	0.0	0.1	O K
8640 min Winter	0.044	0.044	0.0	0.1	O K
10080 min Winter	0.041	0.041	0.0	0.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
30 min Winter	98.106	0.0	32
60 min Winter	59.354	0.0	62
120 min Winter	35.909	0.0	118
180 min Winter	26.763	0.0	174
240 min Winter	21.725	0.0	226
360 min Winter	16.191	0.0	280
480 min Winter	13.143	0.0	358
600 min Winter	11.180	0.0	434
720 min Winter	9.796	0.0	508
960 min Winter	7.627	0.0	646
1440 min Winter	5.360	0.0	894
2160 min Winter	3.767	0.0	1208
2880 min Winter	2.933	0.0	1556
4320 min Winter	2.197	0.0	2248
5760 min Winter	1.790	0.0	2936
7200 min Winter	1.527	0.0	3672
8640 min Winter	1.341	0.0	4376
10080 min Winter	1.202	0.0	5056

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Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	1999
Site Location	GB 498650 101750 SU 98650 01750
C (1km)	-0.025
D1 (1km)	0.390
D2 (1km)	0.245
D3 (1km)	0.403
E (1km)	0.310
F (1km)	2.321
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) 0.005

Time (mins) From:	To:	Area (ha)
0	4	0.005

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Model Details

Storage is Online Cover Level (m) 1.000

Porous Car Park Structure

Infiltration Coefficient Base (m/hr)	0.01728	Width (m)	7.0
Membrane Percolation (mm/hr)	1000	Length (m)	6.0
Max Percolation (l/s)	11.7	Slope (1:X)	60.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	0.000	Membrane Depth (m)	260

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Summary of Results for 10 year Return Period (+40%)

Half Drain Time : 3502 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	0.136	0.136	0.0	1.1	O K
30 min Summer	0.160	0.160	0.0	1.5	O K
60 min Summer	0.185	0.185	0.0	2.0	O K
120 min Summer	0.211	0.211	0.0	2.7	O K
180 min Summer	0.227	0.227	0.0	3.1	O K
240 min Summer	0.239	0.239	0.0	3.4	O K
360 min Summer	0.256	0.256	0.0	3.9	O K
480 min Summer	0.268	0.268	0.0	4.3	O K
600 min Summer	0.279	0.279	0.0	4.6	O K
720 min Summer	0.287	0.287	0.0	4.9	O K
960 min Summer	0.292	0.292	0.0	5.0	O K
1440 min Summer	0.296	0.296	0.0	5.1	O K
2160 min Summer	0.295	0.295	0.0	5.1	O K
2880 min Summer	0.292	0.292	0.0	5.0	O K
4320 min Summer	0.301	0.301	0.0	5.3	O K
5760 min Summer	0.306	0.306	0.0	5.4	O K
7200 min Summer	0.307	0.307	0.0	5.5	O K
8640 min Summer	0.308	0.308	0.0	5.5	O K
10080 min Summer	0.307	0.307	0.0	5.5	O K
15 min Winter	0.148	0.148	0.0	1.3	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	72.148	0.0	19
30 min Summer	45.463	0.0	34
60 min Summer	28.648	0.0	64
120 min Summer	18.052	0.0	124
180 min Summer	13.779	0.0	184
240 min Summer	11.375	0.0	244
360 min Summer	8.683	0.0	364
480 min Summer	7.168	0.0	482
600 min Summer	6.178	0.0	602
720 min Summer	5.471	0.0	722
960 min Summer	4.332	0.0	962
1440 min Summer	3.118	0.0	1440
2160 min Summer	2.244	0.0	2092
2880 min Summer	1.777	0.0	2388
4320 min Summer	1.363	0.0	3196
5760 min Summer	1.130	0.0	4032
7200 min Summer	0.977	0.0	4896
8640 min Summer	0.867	0.0	5704
10080 min Summer	0.784	0.0	6552
15 min Winter	72.148	0.0	19

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Summary of Results for 10 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	0.172	0.172	0.0	1.8	O K
60 min Winter	0.198	0.198	0.0	2.4	O K
120 min Winter	0.226	0.226	0.0	3.1	O K
180 min Winter	0.243	0.243	0.0	3.5	O K
240 min Winter	0.255	0.255	0.0	3.9	O K
360 min Winter	0.274	0.274	0.0	4.5	O K
480 min Winter	0.289	0.289	0.0	4.9	O K
600 min Winter	0.300	0.300	0.0	5.3	O K
720 min Winter	0.310	0.310	0.0	5.6	O K
960 min Winter	0.316	0.316	0.0	5.7	O K
1440 min Winter	0.322	0.322	0.0	5.9	O K
2160 min Winter	0.323	0.323	0.0	5.9	O K
2880 min Winter	0.320	0.320	0.0	5.8	O K
4320 min Winter	0.328	0.328	0.0	6.1	O K
5760 min Winter	0.332	0.332	0.0	6.2	O K
7200 min Winter	0.333	0.333	0.0	6.2	O K
8640 min Winter	0.331	0.331	0.0	6.2	O K
10080 min Winter	0.328	0.328	0.0	6.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
30 min Winter	45.463	0.0	34
60 min Winter	28.648	0.0	64
120 min Winter	18.052	0.0	122
180 min Winter	13.779	0.0	182
240 min Winter	11.375	0.0	240
360 min Winter	8.683	0.0	358
480 min Winter	7.168	0.0	476
600 min Winter	6.178	0.0	594
720 min Winter	5.471	0.0	712
960 min Winter	4.332	0.0	944
1440 min Winter	3.118	0.0	1400
2160 min Winter	2.244	0.0	2076
2880 min Winter	1.777	0.0	2708
4320 min Winter	1.363	0.0	3416
5760 min Winter	1.130	0.0	4376
7200 min Winter	0.977	0.0	5328
8640 min Winter	0.867	0.0	6224
10080 min Winter	0.784	0.0	7160

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Rainfall Details

Rainfall Model	FEH
Return Period (years)	10
FEH Rainfall Version	1999
Site Location	GB 498650 101750 SU 98650 01750
C (1km)	-0.025
D1 (1km)	0.390
D2 (1km)	0.245
D3 (1km)	0.403
E (1km)	0.310
F (1km)	2.321
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) 0.012

Time (mins) From:	To:	Area (ha)
0	4	0.012

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Model Details

Storage is Online Cover Level (m) 1.000

Porous Car Park Structure

Infiltration Coefficient Base (m/hr)	0.00112	Width (m)	20.0
Membrane Percolation (mm/hr)	1000	Length (m)	5.0
Max Percolation (l/s)	27.8	Slope (1:X)	20.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	0.000	Membrane Depth (m)	260

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

Half Drain Time : 6350 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	0.229	0.229	0.0	3.1	O K
30 min Summer	0.255	0.255	0.0	3.9	O K
60 min Summer	0.285	0.285	0.0	4.8	O K
120 min Summer	0.321	0.321	0.0	5.9	O K
180 min Summer	0.344	0.344	0.0	6.6	O K
240 min Summer	0.362	0.362	0.0	7.1	O K
360 min Summer	0.390	0.390	0.0	7.9	O K
480 min Summer	0.410	0.410	0.0	8.6	O K
600 min Summer	0.427	0.427	0.0	9.1	O K
720 min Summer	0.440	0.440	0.0	9.5	O K
960 min Summer	0.447	0.447	0.0	9.7	O K
1440 min Summer	0.453	0.453	0.0	9.8	O K
2160 min Summer	0.453	0.453	0.0	9.8	O K
2880 min Summer	0.448	0.448	0.0	9.7	O K
4320 min Summer	0.459	0.459	0.0	10.0	O K
5760 min Summer	0.463	0.463	0.0	10.1	O K
7200 min Summer	0.465	0.465	0.0	10.2	O K
8640 min Summer	0.464	0.464	0.0	10.2	O K
10080 min Summer	0.462	0.462	0.0	10.1	O K
15 min Winter	0.244	0.244	0.0	3.6	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	162.161	0.0	19
30 min Summer	98.106	0.0	34
60 min Summer	59.354	0.0	64
120 min Summer	35.909	0.0	124
180 min Summer	26.763	0.0	184
240 min Summer	21.725	0.0	244
360 min Summer	16.191	0.0	364
480 min Summer	13.143	0.0	484
600 min Summer	11.180	0.0	604
720 min Summer	9.796	0.0	724
960 min Summer	7.627	0.0	962
1440 min Summer	5.360	0.0	1442
2160 min Summer	3.767	0.0	2160
2880 min Summer	2.933	0.0	2880
4320 min Summer	2.197	0.0	4104
5760 min Summer	1.790	0.0	4784
7200 min Summer	1.527	0.0	5552
8640 min Summer	1.341	0.0	6312
10080 min Summer	1.202	0.0	7160
15 min Winter	162.161	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	0.272	0.272	0.0	4.4	O K
60 min Winter	0.306	0.306	0.0	5.4	O K
120 min Winter	0.346	0.346	0.0	6.6	O K
180 min Winter	0.373	0.373	0.0	7.4	O K
240 min Winter	0.394	0.394	0.0	8.1	O K
360 min Winter	0.424	0.424	0.0	9.0	O K
480 min Winter	0.448	0.448	0.0	9.7	O K
600 min Winter	0.467	0.467	0.0	10.2	O K
720 min Winter	0.482	0.482	0.0	10.7	O K
960 min Winter	0.490	0.490	0.0	11.0	O K
1440 min Winter	0.498	0.498	0.0	11.2	O K
2160 min Winter	0.501	0.501	0.0	11.3	O K
2880 min Winter	0.498	0.498	0.0	11.2	O K
4320 min Winter	0.515	0.515	0.0	11.7	O K
5760 min Winter	0.520	0.520	0.0	11.8	O K
7200 min Winter	0.518	0.518	0.0	11.8	O K
8640 min Winter	0.517	0.517	0.0	11.8	O K
10080 min Winter	0.514	0.514	0.0	11.7	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
30 min Winter	98.106	0.0	34
60 min Winter	59.354	0.0	64
120 min Winter	35.909	0.0	124
180 min Winter	26.763	0.0	182
240 min Winter	21.725	0.0	242
360 min Winter	16.191	0.0	360
480 min Winter	13.143	0.0	478
600 min Winter	11.180	0.0	596
720 min Winter	9.796	0.0	716
960 min Winter	7.627	0.0	952
1440 min Winter	5.360	0.0	1424
2160 min Winter	3.767	0.0	2116
2880 min Winter	2.933	0.0	2796
4320 min Winter	2.197	0.0	4148
5760 min Winter	1.790	0.0	5416
7200 min Winter	1.527	0.0	6408
8640 min Winter	1.341	0.0	6824
10080 min Winter	1.202	0.0	7760

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Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	1999
Site Location	GB 498650 101750 SU 98650 01750
C (1km)	-0.025
D1 (1km)	0.390
D2 (1km)	0.245
D3 (1km)	0.403
E (1km)	0.310
F (1km)	2.321
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) 0.012

Time (mins) From:	To:	Area (ha)
0	4	0.012

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Model Details

Storage is Online Cover Level (m) 1.000

Porous Car Park Structure

Infiltration Coefficient Base (m/hr)	0.00112	Width (m)	20.0
Membrane Percolation (mm/hr)	1000	Length (m)	5.0
Max Percolation (l/s)	27.8	Slope (1:X)	20.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	0.000	Membrane Depth (m)	260

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Summary of Results for 10 year Return Period (+40%)

Half Drain Time : 201 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	0.158	0.158	0.2	1.5	O K
30 min Summer	0.182	0.182	0.2	1.9	O K
60 min Summer	0.208	0.208	0.2	2.4	O K
120 min Summer	0.232	0.232	0.2	2.8	O K
180 min Summer	0.242	0.242	0.2	2.9	O K
240 min Summer	0.248	0.248	0.2	3.0	O K
360 min Summer	0.254	0.254	0.2	3.1	O K
480 min Summer	0.255	0.255	0.2	3.2	O K
600 min Summer	0.254	0.254	0.2	3.1	O K
720 min Summer	0.251	0.251	0.2	3.1	O K
960 min Summer	0.231	0.231	0.2	2.7	O K
1440 min Summer	0.196	0.196	0.2	2.2	O K
2160 min Summer	0.157	0.157	0.2	1.5	O K
2880 min Summer	0.134	0.134	0.2	1.1	O K
4320 min Summer	0.114	0.114	0.1	0.8	O K
5760 min Summer	0.100	0.100	0.1	0.6	O K
7200 min Summer	0.090	0.090	0.1	0.5	O K
8640 min Summer	0.082	0.082	0.1	0.4	O K
10080 min Summer	0.075	0.075	0.1	0.3	O K
15 min Winter	0.171	0.171	0.2	1.7	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	72.148	0.0	18
30 min Summer	45.463	0.0	33
60 min Summer	28.648	0.0	62
120 min Summer	18.052	0.0	120
180 min Summer	13.779	0.0	158
240 min Summer	11.375	0.0	192
360 min Summer	8.683	0.0	258
480 min Summer	7.168	0.0	328
600 min Summer	6.178	0.0	398
720 min Summer	5.471	0.0	468
960 min Summer	4.332	0.0	600
1440 min Summer	3.118	0.0	854
2160 min Summer	2.244	0.0	1212
2880 min Summer	1.777	0.0	1556
4320 min Summer	1.363	0.0	2252
5760 min Summer	1.130	0.0	2992
7200 min Summer	0.977	0.0	3680
8640 min Summer	0.867	0.0	4408
10080 min Summer	0.784	0.0	5144
15 min Winter	72.148	0.0	18

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Summary of Results for 10 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	0.199	0.199	0.2	2.2	O K
60 min Winter	0.229	0.229	0.2	2.7	O K
120 min Winter	0.258	0.258	0.2	3.2	O K
180 min Winter	0.271	0.271	0.2	3.4	O K
240 min Winter	0.277	0.277	0.2	3.5	O K
360 min Winter	0.282	0.282	0.2	3.6	O K
480 min Winter	0.281	0.281	0.2	3.6	O K
600 min Winter	0.277	0.277	0.2	3.5	O K
720 min Winter	0.271	0.271	0.2	3.4	O K
960 min Winter	0.241	0.241	0.2	2.9	O K
1440 min Winter	0.190	0.190	0.2	2.0	O K
2160 min Winter	0.138	0.138	0.2	1.2	O K
2880 min Winter	0.116	0.116	0.1	0.8	O K
4320 min Winter	0.093	0.093	0.1	0.5	O K
5760 min Winter	0.079	0.079	0.1	0.4	O K
7200 min Winter	0.069	0.069	0.1	0.3	O K
8640 min Winter	0.061	0.061	0.1	0.2	O K
10080 min Winter	0.055	0.055	0.1	0.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
30 min Winter	45.463	0.0	32
60 min Winter	28.648	0.0	60
120 min Winter	18.052	0.0	118
180 min Winter	13.779	0.0	172
240 min Winter	11.375	0.0	222
360 min Winter	8.683	0.0	280
480 min Winter	7.168	0.0	358
600 min Winter	6.178	0.0	434
720 min Winter	5.471	0.0	512
960 min Winter	4.332	0.0	652
1440 min Winter	3.118	0.0	910
2160 min Winter	2.244	0.0	1232
2880 min Winter	1.777	0.0	1584
4320 min Winter	1.363	0.0	2292
5760 min Winter	1.130	0.0	3000
7200 min Winter	0.977	0.0	3680
8640 min Winter	0.867	0.0	4408
10080 min Winter	0.784	0.0	5136

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Rainfall Details

Rainfall Model	FEH
Return Period (years)	10
FEH Rainfall Version	1999
Site Location	GB 498650 101750 SU 98650 01750
C (1km)	-0.025
D1 (1km)	0.390
D2 (1km)	0.245
D3 (1km)	0.403
E (1km)	0.310
F (1km)	2.321
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) 0.014

Time (mins) From:	To:	Area (ha)
0	4	0.014

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Model Details

Storage is Online Cover Level (m) 1.000

Porous Car Park Structure

Infiltration Coefficient Base (m/hr)	0.01980	Width (m)	3.3
Membrane Percolation (mm/hr)	1000	Length (m)	17.0
Max Percolation (l/s)	15.6	Slope (1:X)	125.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	0.000	Membrane Depth (m)	260

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

Half Drain Time : 460 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	0.297	0.297	0.2	3.9	O K
30 min Summer	0.344	0.344	0.2	4.6	O K
60 min Summer	0.395	0.395	0.2	5.5	O K
120 min Summer	0.447	0.447	0.2	6.4	O K
180 min Summer	0.473	0.473	0.2	6.8	O K
240 min Summer	0.487	0.487	0.2	7.1	O K
360 min Summer	0.497	0.497	0.2	7.2	O K
480 min Summer	0.498	0.498	0.2	7.2	O K
600 min Summer	0.497	0.497	0.2	7.2	O K
720 min Summer	0.493	0.493	0.2	7.2	O K
960 min Summer	0.458	0.458	0.2	6.6	O K
1440 min Summer	0.399	0.399	0.2	5.6	O K
2160 min Summer	0.327	0.327	0.2	4.4	O K
2880 min Summer	0.267	0.267	0.2	3.4	O K
4320 min Summer	0.204	0.204	0.2	2.3	O K
5760 min Summer	0.160	0.160	0.2	1.5	O K
7200 min Summer	0.135	0.135	0.2	1.1	O K
8640 min Summer	0.122	0.122	0.1	0.9	O K
10080 min Summer	0.112	0.112	0.1	0.8	O K
15 min Winter	0.327	0.327	0.2	4.4	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	162.161	0.0	19
30 min Summer	98.106	0.0	33
60 min Summer	59.354	0.0	62
120 min Summer	35.909	0.0	122
180 min Summer	26.763	0.0	182
240 min Summer	21.725	0.0	240
360 min Summer	16.191	0.0	354
480 min Summer	13.143	0.0	408
600 min Summer	11.180	0.0	474
720 min Summer	9.796	0.0	536
960 min Summer	7.627	0.0	664
1440 min Summer	5.360	0.0	926
2160 min Summer	3.767	0.0	1320
2880 min Summer	2.933	0.0	1700
4320 min Summer	2.197	0.0	2420
5760 min Summer	1.790	0.0	3104
7200 min Summer	1.527	0.0	3744
8640 min Summer	1.341	0.0	4416
10080 min Summer	1.202	0.0	5144
15 min Winter	162.161	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	0.381	0.381	0.2	5.3	O K
60 min Winter	0.440	0.440	0.2	6.3	O K
120 min Winter	0.500	0.500	0.2	7.3	O K
180 min Winter	0.532	0.532	0.2	7.8	O K
240 min Winter	0.552	0.552	0.2	8.1	O K
360 min Winter	0.569	0.569	0.2	8.4	O K
480 min Winter	0.573	0.573	0.2	8.5	O K
600 min Winter	0.568	0.568	0.2	8.4	O K
720 min Winter	0.562	0.562	0.2	8.3	O K
960 min Winter	0.518	0.518	0.2	7.6	O K
1440 min Winter	0.435	0.435	0.2	6.2	O K
2160 min Winter	0.329	0.329	0.2	4.4	O K
2880 min Winter	0.243	0.243	0.2	3.0	O K
4320 min Winter	0.155	0.155	0.2	1.5	O K
5760 min Winter	0.123	0.123	0.1	0.9	O K
7200 min Winter	0.107	0.107	0.1	0.7	O K
8640 min Winter	0.095	0.095	0.1	0.6	O K
10080 min Winter	0.085	0.085	0.1	0.4	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
30 min Winter	98.106	0.0	33
60 min Winter	59.354	0.0	62
120 min Winter	35.909	0.0	120
180 min Winter	26.763	0.0	178
240 min Winter	21.725	0.0	236
360 min Winter	16.191	0.0	348
480 min Winter	13.143	0.0	456
600 min Winter	11.180	0.0	552
720 min Winter	9.796	0.0	574
960 min Winter	7.627	0.0	722
1440 min Winter	5.360	0.0	1012
2160 min Winter	3.767	0.0	1424
2880 min Winter	2.933	0.0	1788
4320 min Winter	2.197	0.0	2424
5760 min Winter	1.790	0.0	3056
7200 min Winter	1.527	0.0	3752
8640 min Winter	1.341	0.0	4488
10080 min Winter	1.202	0.0	5152

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Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	1999
Site Location	GB 498650 101750 SU 98650 01750
C (1km)	-0.025
D1 (1km)	0.390
D2 (1km)	0.245
D3 (1km)	0.403
E (1km)	0.310
F (1km)	2.321
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) 0.014

Time (mins) From:	To:	Area (ha)
0	4	0.014

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Model Details

Storage is Online Cover Level (m) 1.000

Porous Car Park Structure

Infiltration Coefficient Base (m/hr)	0.01980	Width (m)	3.3
Membrane Percolation (mm/hr)	1000	Length (m)	17.0
Max Percolation (l/s)	15.6	Slope (1:X)	125.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	0.000	Membrane Depth (m)	260

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Summary of Results for 10 year Return Period (+40%)

Half Drain Time : 55 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	0.042	0.042	0.1	0.2	O K
30 min Summer	0.050	0.050	0.1	0.3	O K
60 min Summer	0.056	0.056	0.1	0.3	O K
120 min Summer	0.063	0.063	0.1	0.4	O K
180 min Summer	0.065	0.065	0.1	0.4	O K
240 min Summer	0.065	0.065	0.1	0.4	O K
360 min Summer	0.063	0.063	0.1	0.4	O K
480 min Summer	0.060	0.060	0.1	0.4	O K
600 min Summer	0.056	0.056	0.1	0.3	O K
720 min Summer	0.053	0.053	0.1	0.3	O K
960 min Summer	0.046	0.046	0.1	0.3	O K
1440 min Summer	0.038	0.038	0.1	0.2	O K
2160 min Summer	0.033	0.033	0.1	0.1	O K
2880 min Summer	0.029	0.029	0.0	0.1	O K
4320 min Summer	0.026	0.026	0.0	0.1	O K
5760 min Summer	0.024	0.024	0.0	0.1	O K
7200 min Summer	0.022	0.022	0.0	0.1	O K
8640 min Summer	0.021	0.021	0.0	0.1	O K
10080 min Summer	0.020	0.020	0.0	0.0	O K
15 min Winter	0.047	0.047	0.1	0.3	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	72.148	0.0	17
30 min Summer	45.463	0.0	31
60 min Summer	28.648	0.0	50
120 min Summer	18.052	0.0	84
180 min Summer	13.779	0.0	118
240 min Summer	11.375	0.0	154
360 min Summer	8.683	0.0	220
480 min Summer	7.168	0.0	284
600 min Summer	6.178	0.0	344
720 min Summer	5.471	0.0	404
960 min Summer	4.332	0.0	520
1440 min Summer	3.118	0.0	754
2160 min Summer	2.244	0.0	1104
2880 min Summer	1.777	0.0	1472
4320 min Summer	1.363	0.0	2200
5760 min Summer	1.130	0.0	2936
7200 min Summer	0.977	0.0	3632
8640 min Summer	0.867	0.0	4400
10080 min Summer	0.784	0.0	5048
15 min Winter	72.148	0.0	17

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Summary of Results for 10 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	0.056	0.056	0.1	0.3	O K
60 min Winter	0.064	0.064	0.1	0.4	O K
120 min Winter	0.069	0.069	0.1	0.5	O K
180 min Winter	0.070	0.070	0.1	0.5	O K
240 min Winter	0.069	0.069	0.1	0.5	O K
360 min Winter	0.064	0.064	0.1	0.4	O K
480 min Winter	0.057	0.057	0.1	0.4	O K
600 min Winter	0.052	0.052	0.1	0.3	O K
720 min Winter	0.048	0.048	0.1	0.3	O K
960 min Winter	0.041	0.041	0.1	0.2	O K
1440 min Winter	0.033	0.033	0.1	0.1	O K
2160 min Winter	0.029	0.029	0.0	0.1	O K
2880 min Winter	0.025	0.025	0.0	0.1	O K
4320 min Winter	0.022	0.022	0.0	0.1	O K
5760 min Winter	0.020	0.020	0.0	0.1	O K
7200 min Winter	0.019	0.019	0.0	0.0	O K
8640 min Winter	0.018	0.018	0.0	0.0	O K
10080 min Winter	0.017	0.017	0.0	0.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
30 min Winter	45.463	0.0	31
60 min Winter	28.648	0.0	56
120 min Winter	18.052	0.0	92
180 min Winter	13.779	0.0	130
240 min Winter	11.375	0.0	166
360 min Winter	8.683	0.0	234
480 min Winter	7.168	0.0	298
600 min Winter	6.178	0.0	356
720 min Winter	5.471	0.0	414
960 min Winter	4.332	0.0	532
1440 min Winter	3.118	0.0	766
2160 min Winter	2.244	0.0	1120
2880 min Winter	1.777	0.0	1500
4320 min Winter	1.363	0.0	2180
5760 min Winter	1.130	0.0	2928
7200 min Winter	0.977	0.0	3624
8640 min Winter	0.867	0.0	4288
10080 min Winter	0.784	0.0	5008

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Rainfall Details

Rainfall Model	FEH
Return Period (years)	10
FEH Rainfall Version	1999
Site Location	GB 498650 101750 SU 98650 01750
C (1km)	-0.025
D1 (1km)	0.390
D2 (1km)	0.245
D3 (1km)	0.403
E (1km)	0.310
F (1km)	2.321
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) 0.003

Time (mins) From:	To:	Area (ha)
0	4	0.003

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Model Details

Storage is Online Cover Level (m) 13.000

Porous Car Park Structure

Infiltration Coefficient Base (m/hr)	0.01980	Width (m)	5.0
Membrane Percolation (mm/hr)	1000	Length (m)	6.0
Max Percolation (l/s)	8.3	Slope (1:X)	170.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	0.000	Membrane Depth (m)	260

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

Half Drain Time : 129 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	0.096	0.096	0.1	0.7	O K
30 min Summer	0.113	0.113	0.1	0.9	O K
60 min Summer	0.128	0.128	0.1	1.0	O K
120 min Summer	0.137	0.137	0.1	1.1	O K
180 min Summer	0.140	0.140	0.1	1.1	O K
240 min Summer	0.140	0.140	0.1	1.1	O K
360 min Summer	0.137	0.137	0.1	1.1	O K
480 min Summer	0.131	0.131	0.1	1.0	O K
600 min Summer	0.125	0.125	0.1	1.0	O K
720 min Summer	0.118	0.118	0.1	0.9	O K
960 min Summer	0.098	0.098	0.1	0.7	O K
1440 min Summer	0.068	0.068	0.1	0.5	O K
2160 min Summer	0.047	0.047	0.1	0.3	O K
2880 min Summer	0.039	0.039	0.1	0.2	O K
4320 min Summer	0.033	0.033	0.1	0.1	O K
5760 min Summer	0.030	0.030	0.0	0.1	O K
7200 min Summer	0.028	0.028	0.0	0.1	O K
8640 min Summer	0.026	0.026	0.0	0.1	O K
10080 min Summer	0.025	0.025	0.0	0.1	O K
15 min Winter	0.108	0.108	0.1	0.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	162.161	0.0	18
30 min Summer	98.106	0.0	32
60 min Summer	59.354	0.0	62
120 min Summer	35.909	0.0	110
180 min Summer	26.763	0.0	140
240 min Summer	21.725	0.0	174
360 min Summer	16.191	0.0	242
480 min Summer	13.143	0.0	310
600 min Summer	11.180	0.0	380
720 min Summer	9.796	0.0	444
960 min Summer	7.627	0.0	570
1440 min Summer	5.360	0.0	806
2160 min Summer	3.767	0.0	1128
2880 min Summer	2.933	0.0	1484
4320 min Summer	2.197	0.0	2204
5760 min Summer	1.790	0.0	2936
7200 min Summer	1.527	0.0	3672
8640 min Summer	1.341	0.0	4384
10080 min Summer	1.202	0.0	5048
15 min Winter	162.161	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	0.127	0.127	0.1	1.0	O K
60 min Winter	0.145	0.145	0.1	1.1	O K
120 min Winter	0.157	0.157	0.1	1.3	O K
180 min Winter	0.158	0.158	0.1	1.3	O K
240 min Winter	0.158	0.158	0.1	1.3	O K
360 min Winter	0.152	0.152	0.1	1.2	O K
480 min Winter	0.142	0.142	0.1	1.1	O K
600 min Winter	0.131	0.131	0.1	1.0	O K
720 min Winter	0.120	0.120	0.1	0.9	O K
960 min Winter	0.091	0.091	0.1	0.7	O K
1440 min Winter	0.053	0.053	0.1	0.3	O K
2160 min Winter	0.038	0.038	0.1	0.2	O K
2880 min Winter	0.033	0.033	0.1	0.1	O K
4320 min Winter	0.028	0.028	0.0	0.1	O K
5760 min Winter	0.026	0.026	0.0	0.1	O K
7200 min Winter	0.024	0.024	0.0	0.1	O K
8640 min Winter	0.022	0.022	0.0	0.1	O K
10080 min Winter	0.021	0.021	0.0	0.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
30 min Winter	98.106	0.0	32
60 min Winter	59.354	0.0	60
120 min Winter	35.909	0.0	116
180 min Winter	26.763	0.0	154
240 min Winter	21.725	0.0	186
360 min Winter	16.191	0.0	264
480 min Winter	13.143	0.0	338
600 min Winter	11.180	0.0	410
720 min Winter	9.796	0.0	478
960 min Winter	7.627	0.0	606
1440 min Winter	5.360	0.0	806
2160 min Winter	3.767	0.0	1144
2880 min Winter	2.933	0.0	1496
4320 min Winter	2.197	0.0	2244
5760 min Winter	1.790	0.0	2904
7200 min Winter	1.527	0.0	3576
8640 min Winter	1.341	0.0	4392
10080 min Winter	1.202	0.0	5144

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Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	1999
Site Location	GB 498650 101750 SU 98650 01750
C (1km)	-0.025
D1 (1km)	0.390
D2 (1km)	0.245
D3 (1km)	0.403
E (1km)	0.310
F (1km)	2.321
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) 0.003

Time (mins) From:	To:	Area (ha)
0	4	0.003

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Model Details

Storage is Online Cover Level (m) 13.000

Porous Car Park Structure

Infiltration Coefficient Base (m/hr)	0.01980	Width (m)	5.0
Membrane Percolation (mm/hr)	1000	Length (m)	6.0
Max Percolation (l/s)	8.3	Slope (1:X)	170.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	0.000	Membrane Depth (m)	260

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Summary of Results for 10 year Return Period (+40%)

Half Drain Time : 420 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	0.214	0.214	0.1	2.1	O K
30 min Summer	0.246	0.246	0.1	2.6	O K
60 min Summer	0.282	0.282	0.1	3.3	O K
120 min Summer	0.321	0.321	0.1	4.0	O K
180 min Summer	0.343	0.343	0.1	4.4	O K
240 min Summer	0.356	0.356	0.1	4.6	O K
360 min Summer	0.371	0.371	0.1	4.9	O K
480 min Summer	0.379	0.379	0.1	5.0	O K
600 min Summer	0.385	0.385	0.1	5.1	O K
720 min Summer	0.388	0.388	0.1	5.2	O K
960 min Summer	0.372	0.372	0.1	4.9	O K
1440 min Summer	0.342	0.342	0.1	4.4	O K
2160 min Summer	0.301	0.301	0.1	3.6	O K
2880 min Summer	0.266	0.266	0.1	3.0	O K
4320 min Summer	0.230	0.230	0.1	2.3	O K
5760 min Summer	0.204	0.204	0.1	1.9	O K
7200 min Summer	0.188	0.188	0.1	1.6	O K
8640 min Summer	0.174	0.174	0.1	1.4	O K
10080 min Summer	0.163	0.163	0.1	1.2	O K
15 min Winter	0.230	0.230	0.1	2.3	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	72.148	0.0	18
30 min Summer	45.463	0.0	33
60 min Summer	28.648	0.0	62
120 min Summer	18.052	0.0	122
180 min Summer	13.779	0.0	182
240 min Summer	11.375	0.0	240
360 min Summer	8.683	0.0	322
480 min Summer	7.168	0.0	386
600 min Summer	6.178	0.0	452
720 min Summer	5.471	0.0	520
960 min Summer	4.332	0.0	654
1440 min Summer	3.118	0.0	924
2160 min Summer	2.244	0.0	1320
2880 min Summer	1.777	0.0	1700
4320 min Summer	1.363	0.0	2420
5760 min Summer	1.130	0.0	3112
7200 min Summer	0.977	0.0	3824
8640 min Summer	0.867	0.0	4504
10080 min Summer	0.784	0.0	5248
15 min Winter	72.148	0.0	18

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Summary of Results for 10 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	0.1	3.0	O K
60 min Winter	0.307	0.307	0.1	3.7	O K
120 min Winter	0.353	0.353	0.1	4.5	O K
180 min Winter	0.379	0.379	0.1	5.0	O K
240 min Winter	0.396	0.396	0.1	5.3	O K
360 min Winter	0.415	0.415	0.1	5.7	O K
480 min Winter	0.424	0.424	0.1	5.8	O K
600 min Winter	0.428	0.428	0.1	5.9	O K
720 min Winter	0.431	0.431	0.1	6.0	O K
960 min Winter	0.410	0.410	0.1	5.6	O K
1440 min Winter	0.366	0.366	0.1	4.8	O K
2160 min Winter	0.304	0.304	0.1	3.7	O K
2880 min Winter	0.253	0.253	0.1	2.8	O K
4320 min Winter	0.202	0.202	0.1	1.8	O K
5760 min Winter	0.177	0.177	0.1	1.4	O K
7200 min Winter	0.158	0.158	0.1	1.1	O K
8640 min Winter	0.143	0.143	0.1	0.9	O K
10080 min Winter	0.131	0.131	0.1	0.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
30 min Winter	45.463	0.0	33
60 min Winter	28.648	0.0	62
120 min Winter	18.052	0.0	120
180 min Winter	13.779	0.0	178
240 min Winter	11.375	0.0	234
360 min Winter	8.683	0.0	344
480 min Winter	7.168	0.0	448
600 min Winter	6.178	0.0	486
720 min Winter	5.471	0.0	562
960 min Winter	4.332	0.0	712
1440 min Winter	3.118	0.0	1010
2160 min Winter	2.244	0.0	1408
2880 min Winter	1.777	0.0	1788
4320 min Winter	1.363	0.0	2464
5760 min Winter	1.130	0.0	3168
7200 min Winter	0.977	0.0	3888
8640 min Winter	0.867	0.0	4584
10080 min Winter	0.784	0.0	5336

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Rainfall Details

Rainfall Model	FEH
Return Period (years)	10
FEH Rainfall Version	1999
Site Location	GB 498650 101750 SU 98650 01750
C (1km)	-0.025
D1 (1km)	0.390
D2 (1km)	0.245
D3 (1km)	0.403
E (1km)	0.310
F (1km)	2.321
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) 0.018

Time (mins) From:	To:	Area (ha)
0	4	0.018

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Model Details

Storage is Online Cover Level (m) 1.300

Porous Car Park Structure

Infiltration Coefficient Base (m/hr)	0.01440	Width (m)	3.0
Membrane Percolation (mm/hr)	1000	Length (m)	20.0
Max Percolation (l/s)	16.7	Slope (1:X)	100.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	0.000	Membrane Depth (m)	260

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

Half Drain Time : 927 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	0.382	0.382	0.1	5.1	O K
30 min Summer	0.441	0.441	0.1	6.1	O K
60 min Summer	0.509	0.509	0.1	7.4	O K
120 min Summer	0.583	0.583	0.1	8.7	O K
180 min Summer	0.627	0.627	0.1	9.5	O K
240 min Summer	0.657	0.657	0.1	10.0	O K
360 min Summer	0.693	0.693	0.1	10.7	O K
480 min Summer	0.713	0.713	0.1	11.0	O K
600 min Summer	0.723	0.723	0.1	11.2	O K
720 min Summer	0.726	0.726	0.1	11.3	O K
960 min Summer	0.692	0.692	0.1	10.7	O K
1440 min Summer	0.637	0.637	0.1	9.7	O K
2160 min Summer	0.567	0.567	0.1	8.4	O K
2880 min Summer	0.507	0.507	0.1	7.3	O K
4320 min Summer	0.450	0.450	0.1	6.3	O K
5760 min Summer	0.394	0.394	0.1	5.3	O K
7200 min Summer	0.345	0.345	0.1	4.4	O K
8640 min Summer	0.302	0.302	0.1	3.6	O K
10080 min Summer	0.266	0.266	0.1	3.0	O K
15 min Winter	0.419	0.419	0.1	5.7	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	162.161	0.0	19
30 min Summer	98.106	0.0	34
60 min Summer	59.354	0.0	64
120 min Summer	35.909	0.0	122
180 min Summer	26.763	0.0	182
240 min Summer	21.725	0.0	242
360 min Summer	16.191	0.0	362
480 min Summer	13.143	0.0	480
600 min Summer	11.180	0.0	600
720 min Summer	9.796	0.0	702
960 min Summer	7.627	0.0	798
1440 min Summer	5.360	0.0	1036
2160 min Summer	3.767	0.0	1428
2880 min Summer	2.933	0.0	1820
4320 min Summer	2.197	0.0	2636
5760 min Summer	1.790	0.0	3400
7200 min Summer	1.527	0.0	4112
8640 min Summer	1.341	0.0	4840
10080 min Summer	1.202	0.0	5544
15 min Winter	162.161	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	0.486	0.486	0.1	6.9	O K
60 min Winter	0.562	0.562	0.1	8.3	O K
120 min Winter	0.647	0.647	0.1	9.9	O K
180 min Winter	0.699	0.699	0.1	10.8	O K
240 min Winter	0.734	0.734	0.1	11.4	O K
360 min Winter	0.780	0.780	0.1	12.2	O K
480 min Winter	0.807	0.807	0.1	12.7	O K
600 min Winter	0.823	0.823	0.1	13.0	O K
720 min Winter	0.832	0.832	0.1	13.2	O K
960 min Winter	0.794	0.794	0.1	12.5	O K
1440 min Winter	0.722	0.722	0.1	11.2	O K
2160 min Winter	0.628	0.628	0.1	9.5	O K
2880 min Winter	0.543	0.543	0.1	8.0	O K
4320 min Winter	0.447	0.447	0.1	6.3	O K
5760 min Winter	0.360	0.360	0.1	4.7	O K
7200 min Winter	0.286	0.286	0.1	3.3	O K
8640 min Winter	0.229	0.229	0.1	2.3	O K
10080 min Winter	0.197	0.197	0.1	1.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
30 min Winter	98.106	0.0	33
60 min Winter	59.354	0.0	62
120 min Winter	35.909	0.0	122
180 min Winter	26.763	0.0	180
240 min Winter	21.725	0.0	238
360 min Winter	16.191	0.0	354
480 min Winter	13.143	0.0	468
600 min Winter	11.180	0.0	582
720 min Winter	9.796	0.0	694
960 min Winter	7.627	0.0	904
1440 min Winter	5.360	0.0	1112
2160 min Winter	3.767	0.0	1560
2880 min Winter	2.933	0.0	1988
4320 min Winter	2.197	0.0	2812
5760 min Winter	1.790	0.0	3576
7200 min Winter	1.527	0.0	4256
8640 min Winter	1.341	0.0	4848
10080 min Winter	1.202	0.0	5440

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Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	1999
Site Location	GB 498650 101750 SU 98650 01750
C (1km)	-0.025
D1 (1km)	0.390
D2 (1km)	0.245
D3 (1km)	0.403
E (1km)	0.310
F (1km)	2.321
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) 0.018

Time (mins) From:	To:	Area (ha)
0	4	0.018

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Model Details

Storage is Online Cover Level (m) 1.300

Porous Car Park Structure

Infiltration Coefficient Base (m/hr)	0.01440	Width (m)	3.0
Membrane Percolation (mm/hr)	1000	Length (m)	20.0
Max Percolation (l/s)	16.7	Slope (1:X)	100.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	0.000	Membrane Depth (m)	260

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Summary of Results for 10 year Return Period (+40%)

Half Drain Time : 1172 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	5.090	0.090	0.5	20.6	O K
30 min Summer	5.113	0.113	0.5	25.8	O K
60 min Summer	5.140	0.140	0.5	32.0	O K
120 min Summer	5.173	0.173	0.5	39.4	O K
180 min Summer	5.193	0.193	0.5	44.1	O K
240 min Summer	5.209	0.209	0.5	47.6	O K
360 min Summer	5.230	0.230	0.5	52.4	O K
480 min Summer	5.244	0.244	0.5	55.7	O K
600 min Summer	5.254	0.254	0.5	58.0	O K
720 min Summer	5.262	0.262	0.5	59.6	O K
960 min Summer	5.256	0.256	0.5	58.5	O K
1440 min Summer	5.246	0.246	0.5	56.0	O K
2160 min Summer	5.229	0.229	0.5	52.3	O K
2880 min Summer	5.213	0.213	0.5	48.7	O K
4320 min Summer	5.203	0.203	0.5	46.4	O K
5760 min Summer	5.190	0.190	0.5	43.3	O K
7200 min Summer	5.176	0.176	0.5	40.1	O K
8640 min Summer	5.161	0.161	0.5	36.8	O K
10080 min Summer	5.147	0.147	0.5	33.6	O K
15 min Winter	5.101	0.101	0.5	23.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	72.148	0.0	19
30 min Summer	45.463	0.0	34
60 min Summer	28.648	0.0	64
120 min Summer	18.052	0.0	122
180 min Summer	13.779	0.0	182
240 min Summer	11.375	0.0	242
360 min Summer	8.683	0.0	362
480 min Summer	7.168	0.0	482
600 min Summer	6.178	0.0	600
720 min Summer	5.471	0.0	720
960 min Summer	4.332	0.0	896
1440 min Summer	3.118	0.0	1124
2160 min Summer	2.244	0.0	1512
2880 min Summer	1.777	0.0	1904
4320 min Summer	1.363	0.0	2728
5760 min Summer	1.130	0.0	3568
7200 min Summer	0.977	0.0	4328
8640 min Summer	0.867	0.0	5104
10080 min Summer	0.784	0.0	5856
15 min Winter	72.148	0.0	19

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Summary of Results for 10 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	5.127	0.127	0.5	28.9	O K
60 min Winter	5.158	0.158	0.5	36.0	O K
120 min Winter	5.195	0.195	0.5	44.3	O K
180 min Winter	5.218	0.218	0.5	49.8	O K
240 min Winter	5.236	0.236	0.5	53.8	O K
360 min Winter	5.261	0.261	0.5	59.6	O K
480 min Winter	5.279	0.279	0.5	63.6	O K
600 min Winter	5.292	0.292	0.5	66.5	O K
720 min Winter	5.301	0.301	0.5	68.7	O K
960 min Winter	5.298	0.298	0.5	68.0	O K
1440 min Winter	5.284	0.284	0.5	64.6	O K
2160 min Winter	5.262	0.262	0.5	59.8	O K
2880 min Winter	5.240	0.240	0.5	54.7	O K
4320 min Winter	5.219	0.219	0.5	50.0	O K
5760 min Winter	5.195	0.195	0.5	44.4	O K
7200 min Winter	5.170	0.170	0.5	38.7	O K
8640 min Winter	5.146	0.146	0.5	33.2	O K
10080 min Winter	5.123	0.123	0.5	28.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
30 min Winter	45.463	0.0	33
60 min Winter	28.648	0.0	62
120 min Winter	18.052	0.0	122
180 min Winter	13.779	0.0	180
240 min Winter	11.375	0.0	238
360 min Winter	8.683	0.0	356
480 min Winter	7.168	0.0	472
600 min Winter	6.178	0.0	586
720 min Winter	5.471	0.0	700
960 min Winter	4.332	0.0	922
1440 min Winter	3.118	0.0	1312
2160 min Winter	2.244	0.0	1624
2880 min Winter	1.777	0.0	2076
4320 min Winter	1.363	0.0	2984
5760 min Winter	1.130	0.0	3816
7200 min Winter	0.977	0.0	4616
8640 min Winter	0.867	0.0	5440
10080 min Winter	0.784	0.0	6152

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Rainfall Details

Rainfall Model	FEH
Return Period (years)	10
FEH Rainfall Version	1999
Site Location	GB 498650 101750 SU 98650 01750
C (1km)	-0.025
D1 (1km)	0.390
D2 (1km)	0.245
D3 (1km)	0.403
E (1km)	0.310
F (1km)	2.321
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) 0.155

Time (mins) From:	To:	Area (ha)
0	4	0.155

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Model Details

Storage is Online Cover Level (m) 8.000

Cellular Storage Structure

Invert Level (m) 5.000 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.01476 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	240.0	240.0	0.801	0.0	294.4
0.800	240.0	294.4			

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

Half Drain Time : 2307 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	5.205	0.205	0.5	46.7	O K
30 min Summer	5.247	0.247	0.5	56.3	O K
60 min Summer	5.296	0.296	0.5	67.5	O K
120 min Summer	5.353	0.353	0.5	80.5	O K
180 min Summer	5.390	0.390	0.5	88.8	O K
240 min Summer	5.417	0.417	0.5	95.0	O K
360 min Summer	5.455	0.455	0.5	103.8	O K
480 min Summer	5.482	0.482	0.5	110.0	O K
600 min Summer	5.503	0.503	0.5	114.6	O K
720 min Summer	5.518	0.518	0.5	118.2	O K
960 min Summer	5.514	0.514	0.5	117.2	O K
1440 min Summer	5.495	0.495	0.5	112.9	O K
2160 min Summer	5.459	0.459	0.5	104.6	O K
2880 min Summer	5.429	0.429	0.5	97.7	O K
4320 min Summer	5.416	0.416	0.5	94.9	O K
5760 min Summer	5.400	0.400	0.5	91.2	O K
7200 min Summer	5.382	0.382	0.5	87.1	O K
8640 min Summer	5.363	0.363	0.5	82.8	O K
10080 min Summer	5.344	0.344	0.5	78.4	O K
15 min Winter	5.230	0.230	0.5	52.4	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	162.161	0.0	19
30 min Summer	98.106	0.0	34
60 min Summer	59.354	0.0	64
120 min Summer	35.909	0.0	124
180 min Summer	26.763	0.0	184
240 min Summer	21.725	0.0	244
360 min Summer	16.191	0.0	362
480 min Summer	13.143	0.0	482
600 min Summer	11.180	0.0	602
720 min Summer	9.796	0.0	722
960 min Summer	7.627	0.0	962
1440 min Summer	5.360	0.0	1440
2160 min Summer	3.767	0.0	1840
2880 min Summer	2.933	0.0	2188
4320 min Summer	2.197	0.0	2984
5760 min Summer	1.790	0.0	3808
7200 min Summer	1.527	0.0	4616
8640 min Summer	1.341	0.0	5448
10080 min Summer	1.202	0.0	6256
15 min Winter	162.161	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	5.277	0.277	0.5	63.1	O K
60 min Winter	5.332	0.332	0.5	75.8	O K
120 min Winter	5.397	0.397	0.5	90.5	O K
180 min Winter	5.439	0.439	0.5	100.0	O K
240 min Winter	5.470	0.470	0.5	107.1	O K
360 min Winter	5.515	0.515	0.5	117.4	O K
480 min Winter	5.547	0.547	0.5	124.7	O K
600 min Winter	5.571	0.571	0.5	130.2	O K
720 min Winter	5.590	0.590	0.5	134.6	O K
960 min Winter	5.589	0.589	0.5	134.4	O K
1440 min Winter	5.575	0.575	0.5	131.1	O K
2160 min Winter	5.539	0.539	0.5	122.9	O K
2880 min Winter	5.500	0.500	0.5	113.9	O K
4320 min Winter	5.481	0.481	0.5	109.6	O K
5760 min Winter	5.454	0.454	0.5	103.4	O K
7200 min Winter	5.423	0.423	0.5	96.5	O K
8640 min Winter	5.391	0.391	0.5	89.2	O K
10080 min Winter	5.359	0.359	0.5	81.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
30 min Winter	98.106	0.0	34
60 min Winter	59.354	0.0	64
120 min Winter	35.909	0.0	122
180 min Winter	26.763	0.0	182
240 min Winter	21.725	0.0	240
360 min Winter	16.191	0.0	358
480 min Winter	13.143	0.0	476
600 min Winter	11.180	0.0	594
720 min Winter	9.796	0.0	710
960 min Winter	7.627	0.0	942
1440 min Winter	5.360	0.0	1398
2160 min Winter	3.767	0.0	2052
2880 min Winter	2.933	0.0	2336
4320 min Winter	2.197	0.0	3244
5760 min Winter	1.790	0.0	4160
7200 min Winter	1.527	0.0	5048
8640 min Winter	1.341	0.0	5960
10080 min Winter	1.202	0.0	6760

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Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	1999
Site Location	GB 498650 101750 SU 98650 01750
C (1km)	-0.025
D1 (1km)	0.390
D2 (1km)	0.245
D3 (1km)	0.403
E (1km)	0.310
F (1km)	2.321
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) 0.155

Time (mins) From:	To:	Area (ha)
0	4	0.155

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Model Details

Storage is Online Cover Level (m) 8.000

Cellular Storage Structure

Invert Level (m) 5.000 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.01476 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	240.0	240.0	0.801	0.0	294.4
0.800	240.0	294.4			

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Summary of Results for 10 year Return Period (+40%)

Half Drain Time : 709 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	5.060	0.060	0.3	7.1	O K
30 min Summer	5.074	0.074	0.3	8.9	O K
60 min Summer	5.092	0.092	0.3	11.0	O K
120 min Summer	5.112	0.112	0.3	13.4	O K
180 min Summer	5.124	0.124	0.3	14.8	O K
240 min Summer	5.132	0.132	0.3	15.9	O K
360 min Summer	5.143	0.143	0.3	17.2	O K
480 min Summer	5.150	0.150	0.3	17.9	O K
600 min Summer	5.154	0.154	0.3	18.4	O K
720 min Summer	5.157	0.157	0.3	18.8	O K
960 min Summer	5.153	0.153	0.3	18.3	O K
1440 min Summer	5.144	0.144	0.3	17.2	O K
2160 min Summer	5.130	0.130	0.3	15.5	O K
2880 min Summer	5.116	0.116	0.3	13.9	O K
4320 min Summer	5.104	0.104	0.3	12.4	O K
5760 min Summer	5.091	0.091	0.3	10.9	O K
7200 min Summer	5.079	0.079	0.3	9.5	O K
8640 min Summer	5.069	0.069	0.3	8.3	O K
10080 min Summer	5.061	0.061	0.3	7.3	O K
15 min Winter	5.067	0.067	0.3	8.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	72.148	0.0	19
30 min Summer	45.463	0.0	33
60 min Summer	28.648	0.0	64
120 min Summer	18.052	0.0	122
180 min Summer	13.779	0.0	182
240 min Summer	11.375	0.0	242
360 min Summer	8.683	0.0	360
480 min Summer	7.168	0.0	480
600 min Summer	6.178	0.0	538
720 min Summer	5.471	0.0	604
960 min Summer	4.332	0.0	722
1440 min Summer	3.118	0.0	982
2160 min Summer	2.244	0.0	1384
2880 min Summer	1.777	0.0	1788
4320 min Summer	1.363	0.0	2592
5760 min Summer	1.130	0.0	3344
7200 min Summer	0.977	0.0	4040
8640 min Summer	0.867	0.0	4752
10080 min Summer	0.784	0.0	5440
15 min Winter	72.148	0.0	19

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Summary of Results for 10 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	5.084	0.084	0.3	10.0	O K
60 min Winter	5.103	0.103	0.3	12.4	O K
120 min Winter	5.126	0.126	0.3	15.1	O K
180 min Winter	5.140	0.140	0.3	16.8	O K
240 min Winter	5.150	0.150	0.3	18.0	O K
360 min Winter	5.164	0.164	0.3	19.6	O K
480 min Winter	5.172	0.172	0.3	20.6	O K
600 min Winter	5.178	0.178	0.3	21.3	O K
720 min Winter	5.181	0.181	0.3	21.7	O K
960 min Winter	5.175	0.175	0.3	20.9	O K
1440 min Winter	5.162	0.162	0.3	19.4	O K
2160 min Winter	5.142	0.142	0.3	17.0	O K
2880 min Winter	5.122	0.122	0.3	14.6	O K
4320 min Winter	5.099	0.099	0.3	11.8	O K
5760 min Winter	5.078	0.078	0.3	9.3	O K
7200 min Winter	5.061	0.061	0.3	7.3	O K
8640 min Winter	5.050	0.050	0.3	6.0	O K
10080 min Winter	5.046	0.046	0.2	5.5	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
30 min Winter	45.463	0.0	33
60 min Winter	28.648	0.0	62
120 min Winter	18.052	0.0	120
180 min Winter	13.779	0.0	178
240 min Winter	11.375	0.0	236
360 min Winter	8.683	0.0	352
480 min Winter	7.168	0.0	464
600 min Winter	6.178	0.0	574
720 min Winter	5.471	0.0	680
960 min Winter	4.332	0.0	772
1440 min Winter	3.118	0.0	1070
2160 min Winter	2.244	0.0	1516
2880 min Winter	1.777	0.0	1932
4320 min Winter	1.363	0.0	2724
5760 min Winter	1.130	0.0	3464
7200 min Winter	0.977	0.0	4112
8640 min Winter	0.867	0.0	4664
10080 min Winter	0.784	0.0	5344

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Rainfall Details

Rainfall Model	FEH
Return Period (years)	10
FEH Rainfall Version	1999
Site Location	GB 498650 101750 SU 98650 01750
C (1km)	-0.025
D1 (1km)	0.390
D2 (1km)	0.245
D3 (1km)	0.403
E (1km)	0.310
F (1km)	2.321
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) 0.054

Time (mins) From:	To:	Area (ha)
0	4	0.054

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Model Details

Storage is Online Cover Level (m) 8.000

Cellular Storage Structure

Invert Level (m) 5.000 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.01476 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	126.0	126.0	0.401	0.0	144.4
0.400	126.0	144.4			

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

Half Drain Time : 1436 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	5.136	0.136	0.3	16.2	O K
30 min Summer	5.163	0.163	0.3	19.5	O K
60 min Summer	5.195	0.195	0.3	23.3	O K
120 min Summer	5.231	0.231	0.3	27.6	O K
180 min Summer	5.253	0.253	0.3	30.3	O K
240 min Summer	5.269	0.269	0.3	32.3	O K
360 min Summer	5.291	0.291	0.3	34.9	O K
480 min Summer	5.306	0.306	0.3	36.6	O K
600 min Summer	5.315	0.315	0.3	37.8	O K
720 min Summer	5.322	0.322	0.3	38.5	O K
960 min Summer	5.312	0.312	0.3	37.4	O K
1440 min Summer	5.291	0.291	0.3	34.9	O K
2160 min Summer	5.265	0.265	0.3	31.8	O K
2880 min Summer	5.243	0.243	0.3	29.1	O K
4320 min Summer	5.226	0.226	0.3	27.0	O K
5760 min Summer	5.207	0.207	0.3	24.8	O K
7200 min Summer	5.188	0.188	0.3	22.5	O K
8640 min Summer	5.170	0.170	0.3	20.4	O K
10080 min Summer	5.153	0.153	0.3	18.3	O K
15 min Winter	5.152	0.152	0.3	18.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	162.161	0.0	19
30 min Summer	98.106	0.0	34
60 min Summer	59.354	0.0	64
120 min Summer	35.909	0.0	124
180 min Summer	26.763	0.0	182
240 min Summer	21.725	0.0	242
360 min Summer	16.191	0.0	362
480 min Summer	13.143	0.0	482
600 min Summer	11.180	0.0	602
720 min Summer	9.796	0.0	722
960 min Summer	7.627	0.0	960
1440 min Summer	5.360	0.0	1196
2160 min Summer	3.767	0.0	1552
2880 min Summer	2.933	0.0	1936
4320 min Summer	2.197	0.0	2768
5760 min Summer	1.790	0.0	3576
7200 min Summer	1.527	0.0	4392
8640 min Summer	1.341	0.0	5112
10080 min Summer	1.202	0.0	5856
15 min Winter	162.161	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	5.183	0.183	0.3	21.9	O K
60 min Winter	5.219	0.219	0.3	26.2	O K
120 min Winter	5.260	0.260	0.3	31.1	O K
180 min Winter	5.286	0.286	0.3	34.2	O K
240 min Winter	5.304	0.304	0.3	36.4	O K
360 min Winter	5.331	0.331	0.3	39.6	O K
480 min Winter	5.348	0.348	0.3	41.7	O K
600 min Winter	5.360	0.360	0.3	43.1	O K
720 min Winter	5.369	0.369	0.3	44.2	O K
960 min Winter	5.362	0.362	0.3	43.3	O K
1440 min Winter	5.339	0.339	0.3	40.6	O K
2160 min Winter	5.306	0.306	0.3	36.6	O K
2880 min Winter	5.276	0.276	0.3	33.0	O K
4320 min Winter	5.247	0.247	0.3	29.6	O K
5760 min Winter	5.216	0.216	0.3	25.8	O K
7200 min Winter	5.185	0.185	0.3	22.1	O K
8640 min Winter	5.156	0.156	0.3	18.7	O K
10080 min Winter	5.129	0.129	0.3	15.5	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
30 min Winter	98.106	0.0	33
60 min Winter	59.354	0.0	62
120 min Winter	35.909	0.0	122
180 min Winter	26.763	0.0	180
240 min Winter	21.725	0.0	240
360 min Winter	16.191	0.0	356
480 min Winter	13.143	0.0	474
600 min Winter	11.180	0.0	590
720 min Winter	9.796	0.0	704
960 min Winter	7.627	0.0	930
1440 min Winter	5.360	0.0	1354
2160 min Winter	3.767	0.0	1668
2880 min Winter	2.933	0.0	2108
4320 min Winter	2.197	0.0	3024
5760 min Winter	1.790	0.0	3864
7200 min Winter	1.527	0.0	4680
8640 min Winter	1.341	0.0	5448
10080 min Winter	1.202	0.0	6160

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Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	1999
Site Location	GB 498650 101750 SU 98650 01750
C (1km)	-0.025
D1 (1km)	0.390
D2 (1km)	0.245
D3 (1km)	0.403
E (1km)	0.310
F (1km)	2.321
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) 0.054

Time (mins) From:	To:	Area (ha)
0	4	0.054

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Model Details

Storage is Online Cover Level (m) 8.000

Cellular Storage Structure

Invert Level (m) 5.000 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.01476 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	126.0	126.0	0.401	0.0	144.4
0.400	126.0	144.4			

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Summary of Results for 10 year Return Period (+40%)

Half Drain Time : 3608 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	5.043	0.043	0.0	4.3	O K
30 min Summer	5.054	0.054	0.0	5.4	O K
60 min Summer	5.068	0.068	0.0	6.8	O K
120 min Summer	5.085	0.085	0.0	8.5	O K
180 min Summer	5.096	0.096	0.0	9.6	O K
240 min Summer	5.105	0.105	0.0	10.5	O K
360 min Summer	5.119	0.119	0.0	11.9	O K
480 min Summer	5.129	0.129	0.0	12.9	O K
600 min Summer	5.138	0.138	0.0	13.7	O K
720 min Summer	5.145	0.145	0.0	14.4	O K
960 min Summer	5.149	0.149	0.0	14.9	O K
1440 min Summer	5.153	0.153	0.0	15.3	O K
2160 min Summer	5.154	0.154	0.0	15.4	O K
2880 min Summer	5.152	0.152	0.0	15.1	O K
4320 min Summer	5.159	0.159	0.0	15.9	O K
5760 min Summer	5.163	0.163	0.0	16.3	O K
7200 min Summer	5.165	0.165	0.0	16.5	O K
8640 min Summer	5.165	0.165	0.0	16.5	O K
10080 min Summer	5.165	0.165	0.0	16.5	O K
15 min Winter	5.048	0.048	0.0	4.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	72.148	0.0	19
30 min Summer	45.463	0.0	34
60 min Summer	28.648	0.0	64
120 min Summer	18.052	0.0	124
180 min Summer	13.779	0.0	184
240 min Summer	11.375	0.0	244
360 min Summer	8.683	0.0	364
480 min Summer	7.168	0.0	482
600 min Summer	6.178	0.0	602
720 min Summer	5.471	0.0	722
960 min Summer	4.332	0.0	962
1440 min Summer	3.118	0.0	1442
2160 min Summer	2.244	0.0	2160
2880 min Summer	1.777	0.0	2620
4320 min Summer	1.363	0.0	3412
5760 min Summer	1.130	0.0	4200
7200 min Summer	0.977	0.0	5040
8640 min Summer	0.867	0.0	5880
10080 min Summer	0.784	0.0	6752
15 min Winter	72.148	0.0	19

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Summary of Results for 10 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	5.061	0.061	0.0	6.1	O K
60 min Winter	5.076	0.076	0.0	7.6	O K
120 min Winter	5.095	0.095	0.0	9.5	O K
180 min Winter	5.108	0.108	0.0	10.8	O K
240 min Winter	5.118	0.118	0.0	11.8	O K
360 min Winter	5.134	0.134	0.0	13.4	O K
480 min Winter	5.146	0.146	0.0	14.5	O K
600 min Winter	5.155	0.155	0.0	15.5	O K
720 min Winter	5.163	0.163	0.0	16.3	O K
960 min Winter	5.169	0.169	0.0	16.8	O K
1440 min Winter	5.174	0.174	0.0	17.4	O K
2160 min Winter	5.177	0.177	0.0	17.6	O K
2880 min Winter	5.175	0.175	0.0	17.5	O K
4320 min Winter	5.183	0.183	0.0	18.2	O K
5760 min Winter	5.186	0.186	0.0	18.6	O K
7200 min Winter	5.188	0.188	0.0	18.7	O K
8640 min Winter	5.187	0.187	0.0	18.6	O K
10080 min Winter	5.185	0.185	0.0	18.4	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
30 min Winter	45.463	0.0	34
60 min Winter	28.648	0.0	64
120 min Winter	18.052	0.0	122
180 min Winter	13.779	0.0	182
240 min Winter	11.375	0.0	240
360 min Winter	8.683	0.0	358
480 min Winter	7.168	0.0	478
600 min Winter	6.178	0.0	596
720 min Winter	5.471	0.0	714
960 min Winter	4.332	0.0	946
1440 min Winter	3.118	0.0	1412
2160 min Winter	2.244	0.0	2096
2880 min Winter	1.777	0.0	2740
4320 min Winter	1.363	0.0	3972
5760 min Winter	1.130	0.0	4504
7200 min Winter	0.977	0.0	5472
8640 min Winter	0.867	0.0	6400
10080 min Winter	0.784	0.0	7360

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Rainfall Details

Rainfall Model	FEH
Return Period (years)	10
FEH Rainfall Version	1999
Site Location	GB 498650 101750 SU 98650 01750
C (1km)	-0.025
D1 (1km)	0.390
D2 (1km)	0.245
D3 (1km)	0.403
E (1km)	0.310
F (1km)	2.321
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) 0.032

Time (mins) From:	To:	Area (ha)
0	4	0.032

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Model Details

Storage is Online Cover Level (m) 8.000

Cellular Storage Structure

Invert Level (m) 5.000 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00298 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	105.0	105.0	0.401	0.0	122.6
0.400	105.0	122.6			

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

Half Drain Time : 6589 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	5.097	0.097	0.0	9.7	O K
30 min Summer	5.117	0.117	0.0	11.7	O K
60 min Summer	5.142	0.142	0.0	14.1	O K
120 min Summer	5.171	0.171	0.0	17.0	O K
180 min Summer	5.190	0.190	0.0	18.9	O K
240 min Summer	5.204	0.204	0.0	20.4	O K
360 min Summer	5.227	0.227	0.0	22.6	O K
480 min Summer	5.243	0.243	0.0	24.3	O K
600 min Summer	5.257	0.257	0.0	25.6	O K
720 min Summer	5.268	0.268	0.0	26.7	O K
960 min Summer	5.274	0.274	0.0	27.3	O K
1440 min Summer	5.280	0.280	0.0	27.9	O K
2160 min Summer	5.281	0.281	0.0	28.1	O K
2880 min Summer	5.279	0.279	0.0	27.8	O K
4320 min Summer	5.290	0.290	0.0	29.0	O K
5760 min Summer	5.294	0.294	0.0	29.3	O K
7200 min Summer	5.295	0.295	0.0	29.4	O K
8640 min Summer	5.295	0.295	0.0	29.4	O K
10080 min Summer	5.294	0.294	0.0	29.3	O K
15 min Winter	5.109	0.109	0.0	10.9	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	162.161	0.0	19
30 min Summer	98.106	0.0	34
60 min Summer	59.354	0.0	64
120 min Summer	35.909	0.0	124
180 min Summer	26.763	0.0	184
240 min Summer	21.725	0.0	244
360 min Summer	16.191	0.0	364
480 min Summer	13.143	0.0	484
600 min Summer	11.180	0.0	604
720 min Summer	9.796	0.0	724
960 min Summer	7.627	0.0	962
1440 min Summer	5.360	0.0	1442
2160 min Summer	3.767	0.0	2160
2880 min Summer	2.933	0.0	2880
4320 min Summer	2.197	0.0	4320
5760 min Summer	1.790	0.0	5248
7200 min Summer	1.527	0.0	5976
8640 min Summer	1.341	0.0	6744
10080 min Summer	1.202	0.0	7472
15 min Winter	162.161	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	5.132	0.132	0.0	13.1	O K
60 min Winter	5.159	0.159	0.0	15.8	O K
120 min Winter	5.191	0.191	0.0	19.1	O K
180 min Winter	5.213	0.213	0.0	21.2	O K
240 min Winter	5.229	0.229	0.0	22.9	O K
360 min Winter	5.254	0.254	0.0	25.4	O K
480 min Winter	5.273	0.273	0.0	27.3	O K
600 min Winter	5.289	0.289	0.0	28.8	O K
720 min Winter	5.302	0.302	0.0	30.1	O K
960 min Winter	5.309	0.309	0.0	30.8	O K
1440 min Winter	5.316	0.316	0.0	31.6	O K
2160 min Winter	5.320	0.320	0.0	31.9	O K
2880 min Winter	5.319	0.319	0.0	31.8	O K
4320 min Winter	5.336	0.336	0.0	33.5	O K
5760 min Winter	5.343	0.343	0.0	34.2	O K
7200 min Winter	5.344	0.344	0.0	34.3	O K
8640 min Winter	5.342	0.342	0.0	34.1	O K
10080 min Winter	5.340	0.340	0.0	33.9	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
30 min Winter	98.106	0.0	34
60 min Winter	59.354	0.0	64
120 min Winter	35.909	0.0	124
180 min Winter	26.763	0.0	182
240 min Winter	21.725	0.0	242
360 min Winter	16.191	0.0	360
480 min Winter	13.143	0.0	480
600 min Winter	11.180	0.0	598
720 min Winter	9.796	0.0	716
960 min Winter	7.627	0.0	952
1440 min Winter	5.360	0.0	1426
2160 min Winter	3.767	0.0	2120
2880 min Winter	2.933	0.0	2820
4320 min Winter	2.197	0.0	4188
5760 min Winter	1.790	0.0	5480
7200 min Winter	1.527	0.0	6768
8640 min Winter	1.341	0.0	7864
10080 min Winter	1.202	0.0	8064

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Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	1999
Site Location	GB 498650 101750 SU 98650 01750
C (1km)	-0.025
D1 (1km)	0.390
D2 (1km)	0.245
D3 (1km)	0.403
E (1km)	0.310
F (1km)	2.321
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) 0.032

Time (mins) From:	To:	Area (ha)
0	4	0.032

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Model Details

Storage is Online Cover Level (m) 8.000

Cellular Storage Structure

Invert Level (m) 5.000 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00298 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	105.0	105.0	0.401	0.0	122.6
0.400	105.0	122.6			

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Summary of Results for 10 year Return Period (+40%)

Half Drain Time : 569 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	0.167	0.167	0.1	1.7	O K
30 min Summer	0.193	0.193	0.1	2.2	O K
60 min Summer	0.219	0.219	0.1	2.9	O K
120 min Summer	0.246	0.246	0.1	3.6	O K
180 min Summer	0.261	0.261	0.1	4.1	O K
240 min Summer	0.271	0.271	0.1	4.4	O K
360 min Summer	0.282	0.282	0.1	4.8	O K
480 min Summer	0.288	0.288	0.1	5.0	O K
600 min Summer	0.293	0.293	0.1	5.2	O K
720 min Summer	0.297	0.297	0.1	5.3	O K
960 min Summer	0.294	0.294	0.1	5.2	O K
1440 min Summer	0.287	0.287	0.1	4.9	O K
2160 min Summer	0.275	0.275	0.1	4.5	O K
2880 min Summer	0.262	0.262	0.1	4.1	O K
4320 min Summer	0.251	0.251	0.1	3.8	O K
5760 min Summer	0.239	0.239	0.1	3.4	O K
7200 min Summer	0.228	0.228	0.1	3.1	O K
8640 min Summer	0.218	0.218	0.1	2.8	O K
10080 min Summer	0.208	0.208	0.1	2.6	O K
15 min Winter	0.180	0.180	0.1	1.9	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	72.148	0.0	19
30 min Summer	45.463	0.0	33
60 min Summer	28.648	0.0	64
120 min Summer	18.052	0.0	122
180 min Summer	13.779	0.0	182
240 min Summer	11.375	0.0	242
360 min Summer	8.683	0.0	358
480 min Summer	7.168	0.0	412
600 min Summer	6.178	0.0	476
720 min Summer	5.471	0.0	536
960 min Summer	4.332	0.0	672
1440 min Summer	3.118	0.0	940
2160 min Summer	2.244	0.0	1360
2880 min Summer	1.777	0.0	1756
4320 min Summer	1.363	0.0	2548
5760 min Summer	1.130	0.0	3288
7200 min Summer	0.977	0.0	4040
8640 min Summer	0.867	0.0	4760
10080 min Summer	0.784	0.0	5544
15 min Winter	72.148	0.0	19

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Summary of Results for 10 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	0.207	0.207	0.1	2.6	O K
60 min Winter	0.235	0.235	0.1	3.3	O K
120 min Winter	0.264	0.264	0.1	4.2	O K
180 min Winter	0.280	0.280	0.1	4.7	O K
240 min Winter	0.290	0.290	0.1	5.1	O K
360 min Winter	0.303	0.303	0.1	5.5	O K
480 min Winter	0.310	0.310	0.1	5.8	O K
600 min Winter	0.315	0.315	0.1	5.9	O K
720 min Winter	0.319	0.319	0.1	6.1	O K
960 min Winter	0.314	0.314	0.1	5.9	O K
1440 min Winter	0.303	0.303	0.1	5.5	O K
2160 min Winter	0.285	0.285	0.1	4.9	O K
2880 min Winter	0.267	0.267	0.1	4.3	O K
4320 min Winter	0.248	0.248	0.1	3.7	O K
5760 min Winter	0.230	0.230	0.1	3.2	O K
7200 min Winter	0.214	0.214	0.1	2.7	O K
8640 min Winter	0.200	0.200	0.1	2.4	O K
10080 min Winter	0.187	0.187	0.1	2.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
30 min Winter	45.463	0.0	33
60 min Winter	28.648	0.0	62
120 min Winter	18.052	0.0	120
180 min Winter	13.779	0.0	178
240 min Winter	11.375	0.0	236
360 min Winter	8.683	0.0	346
480 min Winter	7.168	0.0	454
600 min Winter	6.178	0.0	548
720 min Winter	5.471	0.0	574
960 min Winter	4.332	0.0	722
1440 min Winter	3.118	0.0	1024
2160 min Winter	2.244	0.0	1452
2880 min Winter	1.777	0.0	1872
4320 min Winter	1.363	0.0	2680
5760 min Winter	1.130	0.0	3456
7200 min Winter	0.977	0.0	4184
8640 min Winter	0.867	0.0	4928
10080 min Winter	0.784	0.0	5656

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Rainfall Details

Rainfall Model	FEH
Return Period (years)	10
FEH Rainfall Version	1999
Site Location	GB 498650 101750 SU 98650 01750
C (1km)	-0.025
D1 (1km)	0.390
D2 (1km)	0.245
D3 (1km)	0.403
E (1km)	0.310
F (1km)	2.321
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) 0.017

Time (mins) From:	To:	Area (ha)
0	4	0.017

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Model Details

Storage is Online Cover Level (m) 1.000

Porous Car Park Structure

Infiltration Coefficient Base (m/hr)	0.00612	Width (m)	5.0
Membrane Percolation (mm/hr)	1000	Length (m)	24.0
Max Percolation (l/s)	33.3	Slope (1:X)	80.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	0.000	Membrane Depth (m)	260

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

Half Drain Time : 1061 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	0.274	0.274	0.1	4.5	O K
30 min Summer	0.304	0.304	0.1	5.5	O K
60 min Summer	0.337	0.337	0.1	6.7	O K
120 min Summer	0.374	0.374	0.1	8.1	O K
180 min Summer	0.396	0.396	0.1	8.9	O K
240 min Summer	0.413	0.413	0.1	9.5	O K
360 min Summer	0.434	0.434	0.1	10.2	O K
480 min Summer	0.447	0.447	0.1	10.7	O K
600 min Summer	0.455	0.455	0.1	11.0	O K
720 min Summer	0.460	0.460	0.1	11.2	O K
960 min Summer	0.449	0.449	0.1	10.8	O K
1440 min Summer	0.430	0.430	0.1	10.1	O K
2160 min Summer	0.404	0.404	0.1	9.2	O K
2880 min Summer	0.381	0.381	0.1	8.3	O K
4320 min Summer	0.361	0.361	0.1	7.6	O K
5760 min Summer	0.340	0.340	0.1	6.8	O K
7200 min Summer	0.321	0.321	0.1	6.2	O K
8640 min Summer	0.305	0.305	0.1	5.6	O K
10080 min Summer	0.292	0.292	0.1	5.1	O K
15 min Winter	0.292	0.292	0.1	5.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	162.161	0.0	19
30 min Summer	98.106	0.0	34
60 min Summer	59.354	0.0	64
120 min Summer	35.909	0.0	122
180 min Summer	26.763	0.0	182
240 min Summer	21.725	0.0	242
360 min Summer	16.191	0.0	362
480 min Summer	13.143	0.0	482
600 min Summer	11.180	0.0	600
720 min Summer	9.796	0.0	720
960 min Summer	7.627	0.0	828
1440 min Summer	5.360	0.0	1064
2160 min Summer	3.767	0.0	1452
2880 min Summer	2.933	0.0	1848
4320 min Summer	2.197	0.0	2640
5760 min Summer	1.790	0.0	3456
7200 min Summer	1.527	0.0	4184
8640 min Summer	1.341	0.0	4928
10080 min Summer	1.202	0.0	5648
15 min Winter	162.161	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	0.324	0.324	0.1	6.3	O K
60 min Winter	0.362	0.362	0.1	7.6	O K
120 min Winter	0.404	0.404	0.1	9.1	O K
180 min Winter	0.430	0.430	0.1	10.1	O K
240 min Winter	0.449	0.449	0.1	10.8	O K
360 min Winter	0.474	0.474	0.1	11.7	O K
480 min Winter	0.490	0.490	0.1	12.3	O K
600 min Winter	0.502	0.502	0.1	12.7	O K
720 min Winter	0.509	0.509	0.1	12.9	O K
960 min Winter	0.498	0.498	0.1	12.5	O K
1440 min Winter	0.472	0.472	0.1	11.6	O K
2160 min Winter	0.438	0.438	0.1	10.4	O K
2880 min Winter	0.405	0.405	0.1	9.2	O K
4320 min Winter	0.371	0.371	0.1	8.0	O K
5760 min Winter	0.338	0.338	0.1	6.8	O K
7200 min Winter	0.310	0.310	0.1	5.8	O K
8640 min Winter	0.289	0.289	0.1	5.0	O K
10080 min Winter	0.272	0.272	0.1	4.4	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
30 min Winter	98.106	0.0	33
60 min Winter	59.354	0.0	62
120 min Winter	35.909	0.0	122
180 min Winter	26.763	0.0	180
240 min Winter	21.725	0.0	238
360 min Winter	16.191	0.0	354
480 min Winter	13.143	0.0	470
600 min Winter	11.180	0.0	584
720 min Winter	9.796	0.0	696
960 min Winter	7.627	0.0	914
1440 min Winter	5.360	0.0	1140
2160 min Winter	3.767	0.0	1580
2880 min Winter	2.933	0.0	2020
4320 min Winter	2.197	0.0	2856
5760 min Winter	1.790	0.0	3640
7200 min Winter	1.527	0.0	4392
8640 min Winter	1.341	0.0	5104
10080 min Winter	1.202	0.0	5848

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Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	1999
Site Location	GB 498650 101750 SU 98650 01750
C (1km)	-0.025
D1 (1km)	0.390
D2 (1km)	0.245
D3 (1km)	0.403
E (1km)	0.310
F (1km)	2.321
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) 0.017

Time (mins) From:	To:	Area (ha)
0	4	0.017

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Model Details

Storage is Online Cover Level (m) 1.000

Porous Car Park Structure

Infiltration Coefficient Base (m/hr)	0.00612	Width (m)	5.0
Membrane Percolation (mm/hr)	1000	Length (m)	24.0
Max Percolation (l/s)	33.3	Slope (1:X)	80.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	0.000	Membrane Depth (m)	260

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Summary of Results for 10 year Return Period (+40%)

Half Drain Time : 602 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	0.111	0.111	0.2	3.5	O K
30 min Summer	0.129	0.129	0.2	4.6	O K
60 min Summer	0.151	0.151	0.2	5.9	O K
120 min Summer	0.175	0.175	0.2	7.4	O K
180 min Summer	0.190	0.190	0.2	8.3	O K
240 min Summer	0.200	0.200	0.2	8.9	O K
360 min Summer	0.213	0.213	0.2	9.7	O K
480 min Summer	0.220	0.220	0.2	10.1	O K
600 min Summer	0.225	0.225	0.2	10.4	O K
720 min Summer	0.228	0.228	0.2	10.6	O K
960 min Summer	0.223	0.223	0.2	10.2	O K
1440 min Summer	0.210	0.210	0.2	9.5	O K
2160 min Summer	0.191	0.191	0.2	8.3	O K
2880 min Summer	0.173	0.173	0.2	7.3	O K
4320 min Summer	0.155	0.155	0.2	6.2	O K
5760 min Summer	0.139	0.139	0.2	5.2	O K
7200 min Summer	0.124	0.124	0.2	4.3	O K
8640 min Summer	0.113	0.113	0.2	3.6	O K
10080 min Summer	0.105	0.105	0.2	3.1	O K
15 min Winter	0.120	0.120	0.2	4.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	72.148	0.0	19
30 min Summer	45.463	0.0	33
60 min Summer	28.648	0.0	62
120 min Summer	18.052	0.0	122
180 min Summer	13.779	0.0	182
240 min Summer	11.375	0.0	242
360 min Summer	8.683	0.0	360
480 min Summer	7.168	0.0	450
600 min Summer	6.178	0.0	512
720 min Summer	5.471	0.0	576
960 min Summer	4.332	0.0	696
1440 min Summer	3.118	0.0	968
2160 min Summer	2.244	0.0	1364
2880 min Summer	1.777	0.0	1760
4320 min Summer	1.363	0.0	2548
5760 min Summer	1.130	0.0	3280
7200 min Summer	0.977	0.0	3968
8640 min Summer	0.867	0.0	4664
10080 min Summer	0.784	0.0	5344
15 min Winter	72.148	0.0	18

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Summary of Results for 10 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	0.140	0.140	0.2	5.3	O K
60 min Winter	0.165	0.165	0.2	6.8	O K
120 min Winter	0.193	0.193	0.2	8.5	O K
180 min Winter	0.210	0.210	0.2	9.5	O K
240 min Winter	0.222	0.222	0.2	10.2	O K
360 min Winter	0.238	0.238	0.2	11.2	O K
480 min Winter	0.248	0.248	0.2	11.8	O K
600 min Winter	0.253	0.253	0.2	12.1	O K
720 min Winter	0.256	0.256	0.2	12.3	O K
960 min Winter	0.248	0.248	0.2	11.8	O K
1440 min Winter	0.231	0.231	0.2	10.7	O K
2160 min Winter	0.202	0.202	0.2	9.0	O K
2880 min Winter	0.176	0.176	0.2	7.4	O K
4320 min Winter	0.145	0.145	0.2	5.6	O K
5760 min Winter	0.120	0.120	0.2	4.0	O K
7200 min Winter	0.104	0.104	0.2	3.1	O K
8640 min Winter	0.095	0.095	0.2	2.6	O K
10080 min Winter	0.087	0.087	0.1	2.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
30 min Winter	45.463	0.0	33
60 min Winter	28.648	0.0	62
120 min Winter	18.052	0.0	120
180 min Winter	13.779	0.0	178
240 min Winter	11.375	0.0	236
360 min Winter	8.683	0.0	350
480 min Winter	7.168	0.0	462
600 min Winter	6.178	0.0	568
720 min Winter	5.471	0.0	670
960 min Winter	4.332	0.0	752
1440 min Winter	3.118	0.0	1054
2160 min Winter	2.244	0.0	1492
2880 min Winter	1.777	0.0	1900
4320 min Winter	1.363	0.0	2680
5760 min Winter	1.130	0.0	3352
7200 min Winter	0.977	0.0	3968
8640 min Winter	0.867	0.0	4672
10080 min Winter	0.784	0.0	5440

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Rainfall Details

Rainfall Model	FEH
Return Period (years)	10
FEH Rainfall Version	1999
Site Location	GB 498650 101750 SU 98650 01750
C (1km)	-0.025
D1 (1km)	0.390
D2 (1km)	0.245
D3 (1km)	0.403
E (1km)	0.310
F (1km)	2.321
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) 0.034

Time (mins) From:	To:	Area (ha)
0	4	0.034

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Model Details

Storage is Online Cover Level (m) 1.000

Porous Car Park Structure

Infiltration Coefficient Base (m/hr)	0.00612	Width (m)	3.8
Membrane Percolation (mm/hr)	1000	Length (m)	53.0
Max Percolation (l/s)	55.9	Slope (1:X)	500.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	0.000	Membrane Depth (m)	260

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

Half Drain Time : 1291 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	0.205	0.205	0.2	9.2	O K
30 min Summer	0.239	0.239	0.2	11.3	O K
60 min Summer	0.279	0.279	0.2	13.6	O K
120 min Summer	0.323	0.323	0.2	16.3	O K
180 min Summer	0.351	0.351	0.2	18.0	O K
240 min Summer	0.370	0.370	0.2	19.2	O K
360 min Summer	0.396	0.396	0.2	20.7	O K
480 min Summer	0.413	0.413	0.2	21.7	O K
600 min Summer	0.424	0.424	0.2	22.4	O K
720 min Summer	0.430	0.430	0.2	22.8	O K
960 min Summer	0.416	0.416	0.2	21.9	O K
1440 min Summer	0.388	0.388	0.2	20.3	O K
2160 min Summer	0.354	0.354	0.2	18.2	O K
2880 min Summer	0.325	0.325	0.2	16.4	O K
4320 min Summer	0.300	0.300	0.2	14.9	O K
5760 min Summer	0.275	0.275	0.2	13.4	O K
7200 min Summer	0.250	0.250	0.2	11.9	O K
8640 min Summer	0.226	0.226	0.2	10.4	O K
10080 min Summer	0.204	0.204	0.2	9.1	O K
15 min Winter	0.226	0.226	0.2	10.4	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	162.161	0.0	19
30 min Summer	98.106	0.0	34
60 min Summer	59.354	0.0	64
120 min Summer	35.909	0.0	124
180 min Summer	26.763	0.0	182
240 min Summer	21.725	0.0	242
360 min Summer	16.191	0.0	362
480 min Summer	13.143	0.0	482
600 min Summer	11.180	0.0	602
720 min Summer	9.796	0.0	720
960 min Summer	7.627	0.0	950
1440 min Summer	5.360	0.0	1140
2160 min Summer	3.767	0.0	1512
2880 min Summer	2.933	0.0	1904
4320 min Summer	2.197	0.0	2724
5760 min Summer	1.790	0.0	3520
7200 min Summer	1.527	0.0	4320
8640 min Summer	1.341	0.0	5096
10080 min Summer	1.202	0.0	5760
15 min Winter	162.161	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	0.264	0.264	0.2	12.8	O K
60 min Winter	0.309	0.309	0.2	15.4	O K
120 min Winter	0.359	0.359	0.2	18.5	O K
180 min Winter	0.391	0.391	0.2	20.4	O K
240 min Winter	0.414	0.414	0.2	21.8	O K
360 min Winter	0.445	0.445	0.2	23.7	O K
480 min Winter	0.465	0.465	0.2	24.9	O K
600 min Winter	0.479	0.479	0.2	25.8	O K
720 min Winter	0.489	0.489	0.2	26.4	O K
960 min Winter	0.477	0.477	0.2	25.6	O K
1440 min Winter	0.445	0.445	0.2	23.7	O K
2160 min Winter	0.401	0.401	0.2	21.0	O K
2880 min Winter	0.361	0.361	0.2	18.6	O K
4320 min Winter	0.320	0.320	0.2	16.1	O K
5760 min Winter	0.278	0.278	0.2	13.6	O K
7200 min Winter	0.237	0.237	0.2	11.1	O K
8640 min Winter	0.200	0.200	0.2	8.9	O K
10080 min Winter	0.168	0.168	0.2	6.9	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
30 min Winter	98.106	0.0	33
60 min Winter	59.354	0.0	62
120 min Winter	35.909	0.0	122
180 min Winter	26.763	0.0	180
240 min Winter	21.725	0.0	240
360 min Winter	16.191	0.0	356
480 min Winter	13.143	0.0	472
600 min Winter	11.180	0.0	588
720 min Winter	9.796	0.0	702
960 min Winter	7.627	0.0	924
1440 min Winter	5.360	0.0	1328
2160 min Winter	3.767	0.0	1640
2880 min Winter	2.933	0.0	2076
4320 min Winter	2.197	0.0	2980
5760 min Winter	1.790	0.0	3808
7200 min Winter	1.527	0.0	4608
8640 min Winter	1.341	0.0	5352
10080 min Winter	1.202	0.0	6048

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Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	1999
Site Location	GB 498650 101750 SU 98650 01750
C (1km)	-0.025
D1 (1km)	0.390
D2 (1km)	0.245
D3 (1km)	0.403
E (1km)	0.310
F (1km)	2.321
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) 0.034

Time (mins) From:	To:	Area (ha)
0	4	0.034

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Model Details

Storage is Online Cover Level (m) 1.000

Porous Car Park Structure

Infiltration Coefficient Base (m/hr)	0.00612	Width (m)	3.8
Membrane Percolation (mm/hr)	1000	Length (m)	53.0
Max Percolation (l/s)	55.9	Slope (1:X)	500.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	0.000	Membrane Depth (m)	260

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Summary of Results for 10 year Return Period (+40%)

Half Drain Time : 1273 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	0.165	0.165	0.1	3.4	O K
30 min Summer	0.191	0.191	0.1	4.6	O K
60 min Summer	0.220	0.220	0.1	6.1	O K
120 min Summer	0.249	0.249	0.1	7.8	O K
180 min Summer	0.266	0.266	0.1	8.9	O K
240 min Summer	0.278	0.278	0.1	9.8	O K
360 min Summer	0.295	0.295	0.1	10.9	O K
480 min Summer	0.305	0.305	0.1	11.7	O K
600 min Summer	0.313	0.313	0.1	12.3	O K
720 min Summer	0.319	0.319	0.1	12.8	O K
960 min Summer	0.318	0.318	0.1	12.7	O K
1440 min Summer	0.315	0.315	0.1	12.5	O K
2160 min Summer	0.310	0.310	0.1	12.1	O K
2880 min Summer	0.303	0.303	0.1	11.6	O K
4320 min Summer	0.302	0.302	0.1	11.5	O K
5760 min Summer	0.297	0.297	0.1	11.1	O K
7200 min Summer	0.291	0.291	0.1	10.7	O K
8640 min Summer	0.285	0.285	0.1	10.2	O K
10080 min Summer	0.279	0.279	0.1	9.8	O K
15 min Winter	0.178	0.178	0.1	4.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	72.148	0.0	19
30 min Summer	45.463	0.0	34
60 min Summer	28.648	0.0	64
120 min Summer	18.052	0.0	124
180 min Summer	13.779	0.0	182
240 min Summer	11.375	0.0	242
360 min Summer	8.683	0.0	362
480 min Summer	7.168	0.0	482
600 min Summer	6.178	0.0	600
720 min Summer	5.471	0.0	720
960 min Summer	4.332	0.0	858
1440 min Summer	3.118	0.0	1096
2160 min Summer	2.244	0.0	1488
2880 min Summer	1.777	0.0	1900
4320 min Summer	1.363	0.0	2724
5760 min Summer	1.130	0.0	3520
7200 min Summer	0.977	0.0	4328
8640 min Summer	0.867	0.0	5104
10080 min Summer	0.784	0.0	5856
15 min Winter	72.148	0.0	19

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Summary of Results for 10 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	0.206	0.206	0.1	5.3	O K
60 min Winter	0.235	0.235	0.1	7.0	O K
120 min Winter	0.266	0.266	0.1	8.9	O K
180 min Winter	0.284	0.284	0.1	10.2	O K
240 min Winter	0.297	0.297	0.1	11.1	O K
360 min Winter	0.315	0.315	0.1	12.5	O K
480 min Winter	0.328	0.328	0.1	13.5	O K
600 min Winter	0.338	0.338	0.1	14.2	O K
720 min Winter	0.346	0.346	0.1	14.8	O K
960 min Winter	0.346	0.346	0.1	14.8	O K
1440 min Winter	0.340	0.340	0.1	14.4	O K
2160 min Winter	0.332	0.332	0.1	13.8	O K
2880 min Winter	0.322	0.322	0.1	13.0	O K
4320 min Winter	0.315	0.315	0.1	12.5	O K
5760 min Winter	0.305	0.305	0.1	11.7	O K
7200 min Winter	0.295	0.295	0.1	10.9	O K
8640 min Winter	0.284	0.284	0.1	10.2	O K
10080 min Winter	0.274	0.274	0.1	9.5	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
30 min Winter	45.463	0.0	33
60 min Winter	28.648	0.0	62
120 min Winter	18.052	0.0	122
180 min Winter	13.779	0.0	180
240 min Winter	11.375	0.0	238
360 min Winter	8.683	0.0	354
480 min Winter	7.168	0.0	470
600 min Winter	6.178	0.0	584
720 min Winter	5.471	0.0	698
960 min Winter	4.332	0.0	916
1440 min Winter	3.118	0.0	1172
2160 min Winter	2.244	0.0	1620
2880 min Winter	1.777	0.0	2072
4320 min Winter	1.363	0.0	2940
5760 min Winter	1.130	0.0	3800
7200 min Winter	0.977	0.0	4608
8640 min Winter	0.867	0.0	5440
10080 min Winter	0.784	0.0	6160

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Rainfall Details

Rainfall Model	FEH
Return Period (years)	10
FEH Rainfall Version	1999
Site Location	GB 498650 101750 SU 98650 01750
C (1km)	-0.025
D1 (1km)	0.390
D2 (1km)	0.245
D3 (1km)	0.403
E (1km)	0.310
F (1km)	2.321
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) 1.000

Porous Car Park Structure

Infiltration Coefficient Base (m/hr)	0.00310	Width (m)	4.2
Membrane Percolation (mm/hr)	1000	Length (m)	60.0
Max Percolation (l/s)	70.0	Slope (1:X)	200.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	0.000	Membrane Depth (m)	260

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

Half Drain Time : 2302 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	0.272	0.272	0.1	9.3	O K
30 min Summer	0.302	0.302	0.1	11.5	O K
60 min Summer	0.336	0.336	0.1	14.0	O K
120 min Summer	0.375	0.375	0.1	17.0	O K
180 min Summer	0.401	0.401	0.1	19.0	O K
240 min Summer	0.420	0.420	0.1	20.4	O K
360 min Summer	0.447	0.447	0.1	22.5	O K
480 min Summer	0.467	0.467	0.1	24.0	O K
600 min Summer	0.482	0.482	0.1	25.1	O K
720 min Summer	0.493	0.493	0.1	26.0	O K
960 min Summer	0.493	0.493	0.1	25.9	O K
1440 min Summer	0.484	0.484	0.1	25.2	O K
2160 min Summer	0.465	0.465	0.1	23.8	O K
2880 min Summer	0.450	0.450	0.1	22.7	O K
4320 min Summer	0.447	0.447	0.1	22.5	O K
5760 min Summer	0.439	0.439	0.1	21.9	O K
7200 min Summer	0.429	0.429	0.1	21.1	O K
8640 min Summer	0.418	0.418	0.1	20.2	O K
10080 min Summer	0.406	0.406	0.1	19.4	O K
15 min Winter	0.290	0.290	0.1	10.6	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	162.161	0.0	19
30 min Summer	98.106	0.0	34
60 min Summer	59.354	0.0	64
120 min Summer	35.909	0.0	124
180 min Summer	26.763	0.0	184
240 min Summer	21.725	0.0	244
360 min Summer	16.191	0.0	362
480 min Summer	13.143	0.0	482
600 min Summer	11.180	0.0	602
720 min Summer	9.796	0.0	722
960 min Summer	7.627	0.0	962
1440 min Summer	5.360	0.0	1440
2160 min Summer	3.767	0.0	1792
2880 min Summer	2.933	0.0	2132
4320 min Summer	2.197	0.0	2944
5760 min Summer	1.790	0.0	3800
7200 min Summer	1.527	0.0	4608
8640 min Summer	1.341	0.0	5440
10080 min Summer	1.202	0.0	6248
15 min Winter	162.161	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	0.322	0.322	0.1	13.0	O K
60 min Winter	0.360	0.360	0.1	15.9	O K
120 min Winter	0.405	0.405	0.1	19.3	O K
180 min Winter	0.434	0.434	0.1	21.5	O K
240 min Winter	0.456	0.456	0.1	23.1	O K
360 min Winter	0.487	0.487	0.1	25.5	O K
480 min Winter	0.510	0.510	0.1	27.2	O K
600 min Winter	0.527	0.527	0.1	28.5	O K
720 min Winter	0.541	0.541	0.1	29.6	O K
960 min Winter	0.542	0.542	0.1	29.7	O K
1440 min Winter	0.536	0.536	0.1	29.2	O K
2160 min Winter	0.516	0.516	0.1	27.7	O K
2880 min Winter	0.495	0.495	0.1	26.1	O K
4320 min Winter	0.489	0.489	0.1	25.6	O K
5760 min Winter	0.475	0.475	0.1	24.6	O K
7200 min Winter	0.457	0.457	0.1	23.2	O K
8640 min Winter	0.438	0.438	0.1	21.8	O K
10080 min Winter	0.419	0.419	0.1	20.3	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
30 min Winter	98.106	0.0	34
60 min Winter	59.354	0.0	64
120 min Winter	35.909	0.0	122
180 min Winter	26.763	0.0	182
240 min Winter	21.725	0.0	240
360 min Winter	16.191	0.0	358
480 min Winter	13.143	0.0	476
600 min Winter	11.180	0.0	592
720 min Winter	9.796	0.0	708
960 min Winter	7.627	0.0	942
1440 min Winter	5.360	0.0	1396
2160 min Winter	3.767	0.0	2032
2880 min Winter	2.933	0.0	2280
4320 min Winter	2.197	0.0	3200
5760 min Winter	1.790	0.0	4144
7200 min Winter	1.527	0.0	5040
8640 min Winter	1.341	0.0	5880
10080 min Winter	1.202	0.0	6752

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Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	1999
Site Location	GB 498650 101750 SU 98650 01750
C (1km)	-0.025
D1 (1km)	0.390
D2 (1km)	0.245
D3 (1km)	0.403
E (1km)	0.310
F (1km)	2.321
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) 1.000

Porous Car Park Structure

Infiltration Coefficient Base (m/hr)	0.00310	Width (m)	4.2
Membrane Percolation (mm/hr)	1000	Length (m)	60.0
Max Percolation (l/s)	70.0	Slope (1:X)	200.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	0.000	Membrane Depth (m)	260

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Summary of Results for 10 year Return Period (+40%)

Half Drain Time : 1694 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	0.220	0.220	0.1	4.0	O K
30 min Summer	0.253	0.253	0.1	5.3	O K
60 min Summer	0.289	0.289	0.1	6.9	O K
120 min Summer	0.327	0.327	0.1	8.8	O K
180 min Summer	0.350	0.350	0.1	10.1	O K
240 min Summer	0.366	0.366	0.1	11.1	O K
360 min Summer	0.388	0.388	0.1	12.4	O K
480 min Summer	0.404	0.404	0.1	13.4	O K
600 min Summer	0.415	0.415	0.1	14.2	O K
720 min Summer	0.424	0.424	0.1	14.8	O K
960 min Summer	0.425	0.425	0.1	14.9	O K
1440 min Summer	0.422	0.422	0.1	14.7	O K
2160 min Summer	0.417	0.417	0.1	14.3	O K
2880 min Summer	0.411	0.411	0.1	13.9	O K
4320 min Summer	0.414	0.414	0.1	14.1	O K
5760 min Summer	0.412	0.412	0.1	14.0	O K
7200 min Summer	0.407	0.407	0.1	13.6	O K
8640 min Summer	0.401	0.401	0.1	13.3	O K
10080 min Summer	0.395	0.395	0.1	12.9	O K
15 min Winter	0.237	0.237	0.1	4.6	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	72.148	0.0	19
30 min Summer	45.463	0.0	34
60 min Summer	28.648	0.0	64
120 min Summer	18.052	0.0	124
180 min Summer	13.779	0.0	184
240 min Summer	11.375	0.0	242
360 min Summer	8.683	0.0	362
480 min Summer	7.168	0.0	482
600 min Summer	6.178	0.0	602
720 min Summer	5.471	0.0	722
960 min Summer	4.332	0.0	960
1440 min Summer	3.118	0.0	1212
2160 min Summer	2.244	0.0	1576
2880 min Summer	1.777	0.0	1964
4320 min Summer	1.363	0.0	2812
5760 min Summer	1.130	0.0	3632
7200 min Summer	0.977	0.0	4464
8640 min Summer	0.867	0.0	5272
10080 min Summer	0.784	0.0	6048
15 min Winter	72.148	0.0	19

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Summary of Results for 10 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	0.271	0.271	0.1	6.1	O K
60 min Winter	0.309	0.309	0.1	7.9	O K
120 min Winter	0.349	0.349	0.1	10.0	O K
180 min Winter	0.373	0.373	0.1	11.5	O K
240 min Winter	0.390	0.390	0.1	12.6	O K
360 min Winter	0.415	0.415	0.1	14.2	O K
480 min Winter	0.432	0.432	0.1	15.3	O K
600 min Winter	0.446	0.446	0.1	16.3	O K
720 min Winter	0.457	0.457	0.1	17.0	O K
960 min Winter	0.460	0.460	0.1	17.2	O K
1440 min Winter	0.458	0.458	0.1	17.0	O K
2160 min Winter	0.449	0.449	0.1	16.5	O K
2880 min Winter	0.440	0.440	0.1	15.8	O K
4320 min Winter	0.439	0.439	0.1	15.8	O K
5760 min Winter	0.432	0.432	0.1	15.3	O K
7200 min Winter	0.421	0.421	0.1	14.6	O K
8640 min Winter	0.409	0.409	0.1	13.8	O K
10080 min Winter	0.398	0.398	0.1	13.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
30 min Winter	45.463	0.0	34
60 min Winter	28.648	0.0	64
120 min Winter	18.052	0.0	122
180 min Winter	13.779	0.0	180
240 min Winter	11.375	0.0	240
360 min Winter	8.683	0.0	356
480 min Winter	7.168	0.0	472
600 min Winter	6.178	0.0	590
720 min Winter	5.471	0.0	702
960 min Winter	4.332	0.0	930
1440 min Winter	3.118	0.0	1356
2160 min Winter	2.244	0.0	1688
2880 min Winter	1.777	0.0	2136
4320 min Winter	1.363	0.0	3068
5760 min Winter	1.130	0.0	3976
7200 min Winter	0.977	0.0	4824
8640 min Winter	0.867	0.0	5624
10080 min Winter	0.784	0.0	6448

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Rainfall Details

Rainfall Model	FEH
Return Period (years)	10
FEH Rainfall Version	1999
Site Location	GB 498650 101750 SU 98650 01750
C (1km)	-0.025
D1 (1km)	0.390
D2 (1km)	0.245
D3 (1km)	0.403
E (1km)	0.310
F (1km)	2.321
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) 0.038

Time (mins) From:	To:	Area (ha)
0	4	0.038

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Model Details

Storage is Online Cover Level (m) 1.000

Porous Car Park Structure

Infiltration Coefficient Base (m/hr)	0.00310	Width (m)	5.5
Membrane Percolation (mm/hr)	1000	Length (m)	40.0
Max Percolation (l/s)	61.1	Slope (1:X)	100.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	0.000	Membrane Depth (m)	260

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

Half Drain Time : 2951 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	0.355	0.355	0.1	10.4	O K
30 min Summer	0.393	0.393	0.1	12.8	O K
60 min Summer	0.436	0.436	0.1	15.6	O K
120 min Summer	0.486	0.486	0.1	18.9	O K
180 min Summer	0.519	0.519	0.1	21.0	O K
240 min Summer	0.543	0.543	0.1	22.6	O K
360 min Summer	0.579	0.579	0.1	25.0	O K
480 min Summer	0.606	0.606	0.1	26.8	O K
600 min Summer	0.626	0.626	0.1	28.1	O K
720 min Summer	0.642	0.642	0.1	29.2	O K
960 min Summer	0.645	0.645	0.1	29.4	O K
1440 min Summer	0.641	0.641	0.1	29.1	O K
2160 min Summer	0.624	0.624	0.1	28.0	O K
2880 min Summer	0.606	0.606	0.1	26.8	O K
4320 min Summer	0.609	0.609	0.1	27.0	O K
5760 min Summer	0.605	0.605	0.1	26.7	O K
7200 min Summer	0.597	0.597	0.1	26.2	O K
8640 min Summer	0.587	0.587	0.1	25.6	O K
10080 min Summer	0.576	0.576	0.1	24.8	O K
15 min Winter	0.378	0.378	0.1	11.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	162.161	0.0	19
30 min Summer	98.106	0.0	34
60 min Summer	59.354	0.0	64
120 min Summer	35.909	0.0	124
180 min Summer	26.763	0.0	184
240 min Summer	21.725	0.0	244
360 min Summer	16.191	0.0	364
480 min Summer	13.143	0.0	482
600 min Summer	11.180	0.0	602
720 min Summer	9.796	0.0	722
960 min Summer	7.627	0.0	962
1440 min Summer	5.360	0.0	1440
2160 min Summer	3.767	0.0	2056
2880 min Summer	2.933	0.0	2340
4320 min Summer	2.197	0.0	3116
5760 min Summer	1.790	0.0	3928
7200 min Summer	1.527	0.0	4760
8640 min Summer	1.341	0.0	5616
10080 min Summer	1.202	0.0	6448
15 min Winter	162.161	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	0.419	0.419	0.1	14.4	O K
60 min Winter	0.467	0.467	0.1	17.6	O K
120 min Winter	0.523	0.523	0.1	21.3	O K
180 min Winter	0.560	0.560	0.1	23.7	O K
240 min Winter	0.588	0.588	0.1	25.6	O K
360 min Winter	0.629	0.629	0.1	28.3	O K
480 min Winter	0.659	0.659	0.1	30.3	O K
600 min Winter	0.683	0.683	0.1	31.9	O K
720 min Winter	0.702	0.702	0.1	33.2	Flood Risk
960 min Winter	0.707	0.707	0.1	33.5	Flood Risk
1440 min Winter	0.707	0.707	0.1	33.4	Flood Risk
2160 min Winter	0.692	0.692	0.1	32.5	O K
2880 min Winter	0.671	0.671	0.1	31.1	O K
4320 min Winter	0.670	0.670	0.1	31.0	O K
5760 min Winter	0.662	0.662	0.1	30.5	O K
7200 min Winter	0.648	0.648	0.1	29.6	O K
8640 min Winter	0.631	0.631	0.1	28.5	O K
10080 min Winter	0.613	0.613	0.1	27.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
30 min Winter	98.106	0.0	34
60 min Winter	59.354	0.0	64
120 min Winter	35.909	0.0	122
180 min Winter	26.763	0.0	182
240 min Winter	21.725	0.0	240
360 min Winter	16.191	0.0	358
480 min Winter	13.143	0.0	476
600 min Winter	11.180	0.0	596
720 min Winter	9.796	0.0	712
960 min Winter	7.627	0.0	944
1440 min Winter	5.360	0.0	1400
2160 min Winter	3.767	0.0	2076
2880 min Winter	2.933	0.0	2684
4320 min Winter	2.197	0.0	3372
5760 min Winter	1.790	0.0	4320
7200 min Winter	1.527	0.0	5192
8640 min Winter	1.341	0.0	6136
10080 min Winter	1.202	0.0	6968

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Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	1999
Site Location	GB 498650 101750 SU 98650 01750
C (1km)	-0.025
D1 (1km)	0.390
D2 (1km)	0.245
D3 (1km)	0.403
E (1km)	0.310
F (1km)	2.321
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) 0.038

Time (mins) From:	To:	Area (ha)
0	4	0.038

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Model Details

Storage is Online Cover Level (m) 1.000

Porous Car Park Structure

Infiltration Coefficient Base (m/hr)	0.00310	Width (m)	5.5
Membrane Percolation (mm/hr)	1000	Length (m)	40.0
Max Percolation (l/s)	61.1	Slope (1:X)	100.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	0.000	Membrane Depth (m)	260

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Summary of Results for 10 year Return Period (+40%)

Half Drain Time : 5991 minutes.

Outflow is too low. Design is unsatisfactory.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	0.209	0.209	0.0	3.4	O K
30 min Summer	0.241	0.241	0.0	4.5	O K
60 min Summer	0.275	0.275	0.0	5.9	O K
120 min Summer	0.312	0.312	0.0	7.6	O K
180 min Summer	0.335	0.335	0.0	8.8	O K
240 min Summer	0.352	0.352	0.0	9.7	O K
360 min Summer	0.378	0.378	0.0	11.1	O K
480 min Summer	0.398	0.398	0.0	12.2	O K
600 min Summer	0.414	0.414	0.0	13.1	O K
720 min Summer	0.428	0.428	0.0	13.8	O K
960 min Summer	0.437	0.437	0.0	14.3	O K
1440 min Summer	0.448	0.448	0.0	14.9	O K
2160 min Summer	0.455	0.455	0.0	15.3	O K
2880 min Summer	0.455	0.455	0.0	15.3	O K
4320 min Summer	0.473	0.473	0.0	16.2	O K
5760 min Summer	0.484	0.484	0.0	16.9	O K
7200 min Summer	0.491	0.491	0.0	17.3	O K
8640 min Summer	0.496	0.496	0.0	17.5	O K
10080 min Summer	0.498	0.498	0.0	17.7	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	72.148	0.0	19
30 min Summer	45.463	0.0	34
60 min Summer	28.648	0.0	64
120 min Summer	18.052	0.0	124
180 min Summer	13.779	0.0	184
240 min Summer	11.375	0.0	244
360 min Summer	8.683	0.0	364
480 min Summer	7.168	0.0	484
600 min Summer	6.178	0.0	604
720 min Summer	5.471	0.0	722
960 min Summer	4.332	0.0	962
1440 min Summer	3.118	0.0	1442
2160 min Summer	2.244	0.0	2160
2880 min Summer	1.777	0.0	2880
4320 min Summer	1.363	0.0	3764
5760 min Summer	1.130	0.0	4608
7200 min Summer	0.977	0.0	5400
8640 min Summer	0.867	0.0	6224
10080 min Summer	0.784	0.0	7056

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Summary of Results for 10 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Winter	0.224	0.224	0.0	3.9	O K
30 min Winter	0.257	0.257	0.0	5.2	O K
60 min Winter	0.293	0.293	0.0	6.7	O K
120 min Winter	0.333	0.333	0.0	8.6	O K
180 min Winter	0.357	0.357	0.0	10.0	O K
240 min Winter	0.376	0.376	0.0	11.0	O K
360 min Winter	0.405	0.405	0.0	12.6	O K
480 min Winter	0.428	0.428	0.0	13.8	O K
600 min Winter	0.446	0.446	0.0	14.8	O K
720 min Winter	0.462	0.462	0.0	15.7	O K
960 min Winter	0.473	0.473	0.0	16.3	O K
1440 min Winter	0.487	0.487	0.0	17.0	O K
2160 min Winter	0.496	0.496	0.0	17.6	O K
2880 min Winter	0.499	0.499	0.0	17.7	O K
4320 min Winter	0.522	0.522	0.0	19.0	O K
5760 min Winter	0.534	0.534	0.0	19.6	O K
7200 min Winter	0.540	0.540	0.0	19.9	O K
8640 min Winter	0.545	0.545	0.0	20.2	O K
10080 min Winter	0.547	0.547	0.0	20.3	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Winter	72.148	0.0	19
30 min Winter	45.463	0.0	34
60 min Winter	28.648	0.0	64
120 min Winter	18.052	0.0	122
180 min Winter	13.779	0.0	182
240 min Winter	11.375	0.0	242
360 min Winter	8.683	0.0	360
480 min Winter	7.168	0.0	478
600 min Winter	6.178	0.0	596
720 min Winter	5.471	0.0	714
960 min Winter	4.332	0.0	952
1440 min Winter	3.118	0.0	1414
2160 min Winter	2.244	0.0	2116
2880 min Winter	1.777	0.0	2792
4320 min Winter	1.363	0.0	4108
5760 min Winter	1.130	0.0	5352
7200 min Winter	0.977	0.0	5768
8640 min Winter	0.867	0.0	6736
10080 min Winter	0.784	0.0	7664

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Rainfall Details

Rainfall Model	FEH
Return Period (years)	10
FEH Rainfall Version	1999
Site Location	GB 498650 101750 SU 98650 01750
C (1km)	-0.025
D1 (1km)	0.390
D2 (1km)	0.245
D3 (1km)	0.403
E (1km)	0.310
F (1km)	2.321
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) 0.032

Time (mins) From:	To:	Area (ha)
0	4	0.032

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Model Details

Storage is Online Cover Level (m) 1.100

Porous Car Park Structure

Infiltration Coefficient Base (m/hr)	0.00112	Width (m)	6.5
Membrane Percolation (mm/hr)	1000	Length (m)	28.0
Max Percolation (l/s)	50.6	Slope (1:X)	80.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	0.000	Membrane Depth (m)	260

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

Half Drain Time exceeds 7 days.

Outflow is too low. Design is unsatisfactory.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	0.336	0.336	0.0	8.8	O K
30 min Summer	0.373	0.373	0.0	10.8	O K
60 min Summer	0.418	0.418	0.0	13.2	O K
120 min Summer	0.471	0.471	0.0	16.1	O K
180 min Summer	0.506	0.506	0.0	18.1	O K
240 min Summer	0.534	0.534	0.0	19.6	O K
360 min Summer	0.575	0.575	0.0	21.8	O K
480 min Summer	0.607	0.607	0.0	23.6	O K
600 min Summer	0.632	0.632	0.0	25.0	O K
720 min Summer	0.654	0.654	0.0	26.1	O K
960 min Summer	0.666	0.666	0.0	26.8	O K
1440 min Summer	0.681	0.681	0.0	27.6	O K
2160 min Summer	0.690	0.690	0.0	28.1	O K
2880 min Summer	0.692	0.692	0.0	28.2	O K
4320 min Summer	0.725	0.725	0.0	30.0	O K
5760 min Summer	0.741	0.741	0.0	30.9	O K
7200 min Summer	0.748	0.748	0.0	31.3	O K
8640 min Summer	0.752	0.752	0.0	31.5	O K
10080 min Summer	0.754	0.754	0.0	31.6	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	162.161	0.0	19
30 min Summer	98.106	0.0	34
60 min Summer	59.354	0.0	64
120 min Summer	35.909	0.0	124
180 min Summer	26.763	0.0	184
240 min Summer	21.725	0.0	244
360 min Summer	16.191	0.0	364
480 min Summer	13.143	0.0	484
600 min Summer	11.180	0.0	604
720 min Summer	9.796	0.0	724
960 min Summer	7.627	0.0	964
1440 min Summer	5.360	0.0	1442
2160 min Summer	3.767	0.0	2164
2880 min Summer	2.933	0.0	2880
4320 min Summer	2.197	0.0	4320
5760 min Summer	1.790	0.0	5760
7200 min Summer	1.527	0.0	6848
8640 min Summer	1.341	0.0	7520
10080 min Summer	1.202	0.0	8272

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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
15 min Winter	0.357	0.357	0.0	10.0	O K
30 min Winter	0.399	0.399	0.0	12.2	O K
60 min Winter	0.449	0.449	0.0	15.0	O K
120 min Winter	0.508	0.508	0.0	18.2	O K
180 min Winter	0.548	0.548	0.0	20.4	O K
240 min Winter	0.579	0.579	0.0	22.1	O K
360 min Winter	0.626	0.626	0.0	24.6	O K
480 min Winter	0.662	0.662	0.0	26.6	O K
600 min Winter	0.691	0.691	0.0	28.2	O K
720 min Winter	0.715	0.715	0.0	29.5	O K
960 min Winter	0.730	0.730	0.0	30.3	O K
1440 min Winter	0.748	0.748	0.0	31.3	O K
2160 min Winter	0.761	0.761	0.0	32.0	O K
2880 min Winter	0.765	0.765	0.0	32.2	O K
4320 min Winter	0.807	0.807	0.0	34.5	Flood Risk
5760 min Winter	0.830	0.830	0.0	35.8	Flood Risk
7200 min Winter	0.844	0.844	0.0	36.5	Flood Risk
8640 min Winter	0.850	0.850	0.0	36.8	Flood Risk
10080 min Winter	0.851	0.851	0.0	36.9	Flood Risk

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Winter	162.161	0.0	19
30 min Winter	98.106	0.0	34
60 min Winter	59.354	0.0	64
120 min Winter	35.909	0.0	124
180 min Winter	26.763	0.0	182
240 min Winter	21.725	0.0	242
360 min Winter	16.191	0.0	362
480 min Winter	13.143	0.0	480
600 min Winter	11.180	0.0	598
720 min Winter	9.796	0.0	716
960 min Winter	7.627	0.0	954
1440 min Winter	5.360	0.0	1428
2160 min Winter	3.767	0.0	2136
2880 min Winter	2.933	0.0	2824
4320 min Winter	2.197	0.0	4196
5760 min Winter	1.790	0.0	5584
7200 min Winter	1.527	0.0	6912
8640 min Winter	1.341	0.0	8208
10080 min Winter	1.202	0.0	9472

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Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	1999
Site Location	GB 498650 101750 SU 98650 01750
C (1km)	-0.025
D1 (1km)	0.390
D2 (1km)	0.245
D3 (1km)	0.403
E (1km)	0.310
F (1km)	2.321
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) 0.032

Time (mins) From:	To:	Area (ha)
0	4	0.032

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Model Details

Storage is Online Cover Level (m) 1.100

Porous Car Park Structure

Infiltration Coefficient Base (m/hr)	0.00112	Width (m)	6.5
Membrane Percolation (mm/hr)	1000	Length (m)	28.0
Max Percolation (l/s)	50.6	Slope (1:X)	80.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	0.000	Membrane Depth (m)	260

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Summary of Results for 10 year Return Period (+40%)

Half Drain Time : 377 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	0.332	0.332	0.4	6.4	O K
30 min Summer	0.374	0.374	0.4	8.0	O K
60 min Summer	0.418	0.418	0.4	10.0	O K
120 min Summer	0.465	0.465	0.4	12.0	O K
180 min Summer	0.491	0.491	0.4	13.1	O K
240 min Summer	0.507	0.507	0.4	13.8	O K
360 min Summer	0.525	0.525	0.4	14.6	O K
480 min Summer	0.535	0.535	0.4	15.0	O K
600 min Summer	0.542	0.542	0.4	15.3	O K
720 min Summer	0.545	0.545	0.4	15.5	O K
960 min Summer	0.527	0.527	0.4	14.6	O K
1440 min Summer	0.489	0.489	0.4	13.0	O K
2160 min Summer	0.438	0.438	0.4	10.8	O K
2880 min Summer	0.397	0.397	0.4	9.0	O K
4320 min Summer	0.360	0.360	0.4	7.5	O K
5760 min Summer	0.333	0.333	0.4	6.4	O K
7200 min Summer	0.309	0.309	0.3	5.5	O K
8640 min Summer	0.288	0.288	0.3	4.8	O K
10080 min Summer	0.271	0.271	0.3	4.2	O K
15 min Winter	0.354	0.354	0.4	7.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	72.148	0.0	18
30 min Summer	45.463	0.0	33
60 min Summer	28.648	0.0	62
120 min Summer	18.052	0.0	122
180 min Summer	13.779	0.0	180
240 min Summer	11.375	0.0	240
360 min Summer	8.683	0.0	306
480 min Summer	7.168	0.0	372
600 min Summer	6.178	0.0	438
720 min Summer	5.471	0.0	506
960 min Summer	4.332	0.0	644
1440 min Summer	3.118	0.0	910
2160 min Summer	2.244	0.0	1300
2880 min Summer	1.777	0.0	1672
4320 min Summer	1.363	0.0	2380
5760 min Summer	1.130	0.0	3120
7200 min Summer	0.977	0.0	3824
8640 min Summer	0.867	0.0	4584
10080 min Summer	0.784	0.0	5256
15 min Winter	72.148	0.0	18

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Summary of Results for 10 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	0.399	0.399	0.4	9.1	O K
60 min Winter	0.450	0.450	0.4	11.3	O K
120 min Winter	0.505	0.505	0.4	13.7	O K
180 min Winter	0.536	0.536	0.4	15.1	O K
240 min Winter	0.556	0.556	0.4	15.9	O K
360 min Winter	0.579	0.579	0.4	16.9	O K
480 min Winter	0.588	0.588	0.4	17.3	O K
600 min Winter	0.594	0.594	0.4	17.6	O K
720 min Winter	0.597	0.597	0.4	17.7	O K
960 min Winter	0.570	0.570	0.4	16.5	O K
1440 min Winter	0.515	0.515	0.4	14.1	O K
2160 min Winter	0.439	0.439	0.4	10.9	O K
2880 min Winter	0.382	0.382	0.4	8.4	O K
4320 min Winter	0.333	0.333	0.4	6.4	O K
5760 min Winter	0.296	0.296	0.3	5.0	O K
7200 min Winter	0.266	0.266	0.3	4.1	O K
8640 min Winter	0.241	0.241	0.3	3.4	O K
10080 min Winter	0.222	0.222	0.2	2.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
30 min Winter	45.463	0.0	33
60 min Winter	28.648	0.0	62
120 min Winter	18.052	0.0	120
180 min Winter	13.779	0.0	176
240 min Winter	11.375	0.0	234
360 min Winter	8.683	0.0	342
480 min Winter	7.168	0.0	430
600 min Winter	6.178	0.0	472
720 min Winter	5.471	0.0	550
960 min Winter	4.332	0.0	702
1440 min Winter	3.118	0.0	994
2160 min Winter	2.244	0.0	1384
2880 min Winter	1.777	0.0	1732
4320 min Winter	1.363	0.0	2468
5760 min Winter	1.130	0.0	3224
7200 min Winter	0.977	0.0	3896
8640 min Winter	0.867	0.0	4664
10080 min Winter	0.784	0.0	5344

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Rainfall Details

Rainfall Model	FEH
Return Period (years)	10
FEH Rainfall Version	1999
Site Location	GB 498650 101750 SU 98650 01750
C (1km)	-0.025
D1 (1km)	0.390
D2 (1km)	0.245
D3 (1km)	0.403
E (1km)	0.310
F (1km)	2.321
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) 0.054

Time (mins) From:	To:	Area (ha)
0	4	0.054

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Model Details

Storage is Online Cover Level (m) 1.500

Porous Car Park Structure

Infiltration Coefficient Base (m/hr)	0.01980	Width (m)	4.8
Membrane Percolation (mm/hr)	1000	Length (m)	30.0
Max Percolation (l/s)	40.0	Slope (1:X)	80.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	0.000	Membrane Depth (m)	260

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

Half Drain Time : 827 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	0.544	0.544	0.4	15.4	O K
30 min Summer	0.618	0.618	0.4	18.6	O K
60 min Summer	0.702	0.702	0.4	22.2	O K
120 min Summer	0.793	0.793	0.4	26.2	O K
180 min Summer	0.846	0.846	0.4	28.5	O K
240 min Summer	0.882	0.882	0.4	30.0	O K
360 min Summer	0.925	0.925	0.4	31.8	O K
480 min Summer	0.947	0.947	0.4	32.8	O K
600 min Summer	0.956	0.956	0.4	33.2	O K
720 min Summer	0.959	0.959	0.4	33.3	O K
960 min Summer	0.919	0.919	0.4	31.6	O K
1440 min Summer	0.849	0.849	0.4	28.6	O K
2160 min Summer	0.760	0.760	0.4	24.7	O K
2880 min Summer	0.684	0.684	0.4	21.5	O K
4320 min Summer	0.610	0.610	0.4	18.2	O K
5760 min Summer	0.541	0.541	0.4	15.3	O K
7200 min Summer	0.481	0.481	0.4	12.7	O K
8640 min Summer	0.432	0.432	0.4	10.6	O K
10080 min Summer	0.394	0.394	0.4	8.9	O K
15 min Winter	0.589	0.589	0.4	17.4	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	162.161	0.0	19
30 min Summer	98.106	0.0	34
60 min Summer	59.354	0.0	64
120 min Summer	35.909	0.0	122
180 min Summer	26.763	0.0	182
240 min Summer	21.725	0.0	242
360 min Summer	16.191	0.0	362
480 min Summer	13.143	0.0	480
600 min Summer	11.180	0.0	600
720 min Summer	9.796	0.0	658
960 min Summer	7.627	0.0	760
1440 min Summer	5.360	0.0	1010
2160 min Summer	3.767	0.0	1408
2880 min Summer	2.933	0.0	1812
4320 min Summer	2.197	0.0	2592
5760 min Summer	1.790	0.0	3344
7200 min Summer	1.527	0.0	4040
8640 min Summer	1.341	0.0	4752
10080 min Summer	1.202	0.0	5440
15 min Winter	162.161	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	0.673	0.673	0.4	21.0	O K
60 min Winter	0.768	0.768	0.4	25.1	O K
120 min Winter	0.873	0.873	0.4	29.6	O K
180 min Winter	0.936	0.936	0.4	32.3	O K
240 min Winter	0.978	0.978	0.4	34.2	O K
360 min Winter	1.033	1.033	0.4	36.5	O K
480 min Winter	1.064	1.064	0.4	37.8	O K
600 min Winter	1.081	1.081	0.4	38.6	O K
720 min Winter	1.089	1.089	0.4	38.9	O K
960 min Winter	1.038	1.038	0.4	36.7	O K
1440 min Winter	0.949	0.949	0.4	32.9	O K
2160 min Winter	0.827	0.827	0.4	27.6	O K
2880 min Winter	0.718	0.718	0.4	22.9	O K
4320 min Winter	0.595	0.595	0.4	17.6	O K
5760 min Winter	0.489	0.489	0.4	13.0	O K
7200 min Winter	0.407	0.407	0.4	9.5	O K
8640 min Winter	0.361	0.361	0.4	7.5	O K
10080 min Winter	0.332	0.332	0.4	6.3	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
30 min Winter	98.106	0.0	33
60 min Winter	59.354	0.0	62
120 min Winter	35.909	0.0	120
180 min Winter	26.763	0.0	180
240 min Winter	21.725	0.0	238
360 min Winter	16.191	0.0	354
480 min Winter	13.143	0.0	468
600 min Winter	11.180	0.0	578
720 min Winter	9.796	0.0	688
960 min Winter	7.627	0.0	886
1440 min Winter	5.360	0.0	1096
2160 min Winter	3.767	0.0	1536
2880 min Winter	2.933	0.0	1960
4320 min Winter	2.197	0.0	2764
5760 min Winter	1.790	0.0	3512
7200 min Winter	1.527	0.0	4112
8640 min Winter	1.341	0.0	4752
10080 min Winter	1.202	0.0	5448

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Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	1999
Site Location	GB 498650 101750 SU 98650 01750
C (1km)	-0.025
D1 (1km)	0.390
D2 (1km)	0.245
D3 (1km)	0.403
E (1km)	0.310
F (1km)	2.321
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) 0.054

Time (mins) From:	To:	Area (ha)
0	4	0.054

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Model Details

Storage is Online Cover Level (m) 1.500

Porous Car Park Structure

Infiltration Coefficient Base (m/hr)	0.01980	Width (m)	4.8
Membrane Percolation (mm/hr)	1000	Length (m)	30.0
Max Percolation (l/s)	40.0	Slope (1:X)	80.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	0.000	Membrane Depth (m)	260

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Summary of Results for 10 year Return Period (+40%)

Half Drain Time : 4725 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	0.195	0.195	0.0	3.4	O K
30 min Summer	0.227	0.227	0.0	4.6	O K
60 min Summer	0.261	0.261	0.0	6.2	O K
120 min Summer	0.298	0.298	0.0	8.0	O K
180 min Summer	0.321	0.321	0.0	9.3	O K
240 min Summer	0.338	0.338	0.0	10.3	O K
360 min Summer	0.362	0.362	0.0	11.8	O K
480 min Summer	0.379	0.379	0.0	12.9	O K
600 min Summer	0.392	0.392	0.0	13.9	O K
720 min Summer	0.403	0.403	0.0	14.6	O K
960 min Summer	0.410	0.410	0.0	15.1	O K
1440 min Summer	0.417	0.417	0.0	15.6	O K
2160 min Summer	0.419	0.419	0.0	15.8	O K
2880 min Summer	0.417	0.417	0.0	15.6	O K
4320 min Summer	0.429	0.429	0.0	16.6	O K
5760 min Summer	0.436	0.436	0.0	17.1	O K
7200 min Summer	0.441	0.441	0.0	17.5	O K
8640 min Summer	0.443	0.443	0.0	17.7	O K
10080 min Summer	0.444	0.444	0.0	17.7	O K
15 min Winter	0.211	0.211	0.0	4.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	72.148	0.0	19
30 min Summer	45.463	0.0	34
60 min Summer	28.648	0.0	64
120 min Summer	18.052	0.0	124
180 min Summer	13.779	0.0	184
240 min Summer	11.375	0.0	244
360 min Summer	8.683	0.0	364
480 min Summer	7.168	0.0	484
600 min Summer	6.178	0.0	602
720 min Summer	5.471	0.0	722
960 min Summer	4.332	0.0	962
1440 min Summer	3.118	0.0	1442
2160 min Summer	2.244	0.0	2160
2880 min Summer	1.777	0.0	2620
4320 min Summer	1.363	0.0	3332
5760 min Summer	1.130	0.0	4152
7200 min Summer	0.977	0.0	4976
8640 min Summer	0.867	0.0	5872
10080 min Summer	0.784	0.0	6664
15 min Winter	72.148	0.0	19

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Summary of Results for 10 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	0.244	0.244	0.0	5.4	O K
60 min Winter	0.280	0.280	0.0	7.0	O K
120 min Winter	0.319	0.319	0.0	9.1	O K
180 min Winter	0.343	0.343	0.0	10.6	O K
240 min Winter	0.360	0.360	0.0	11.7	O K
360 min Winter	0.386	0.386	0.0	13.4	O K
480 min Winter	0.404	0.404	0.0	14.7	O K
600 min Winter	0.418	0.418	0.0	15.8	O K
720 min Winter	0.430	0.430	0.0	16.6	O K
960 min Winter	0.438	0.438	0.0	17.2	O K
1440 min Winter	0.446	0.446	0.0	17.9	O K
2160 min Winter	0.451	0.451	0.0	18.2	O K
2880 min Winter	0.450	0.450	0.0	18.2	O K
4320 min Winter	0.462	0.462	0.0	19.1	O K
5760 min Winter	0.470	0.470	0.0	19.7	O K
7200 min Winter	0.474	0.474	0.0	20.0	O K
8640 min Winter	0.475	0.475	0.0	20.1	O K
10080 min Winter	0.474	0.474	0.0	20.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
30 min Winter	45.463	0.0	34
60 min Winter	28.648	0.0	64
120 min Winter	18.052	0.0	122
180 min Winter	13.779	0.0	182
240 min Winter	11.375	0.0	240
360 min Winter	8.683	0.0	360
480 min Winter	7.168	0.0	478
600 min Winter	6.178	0.0	596
720 min Winter	5.471	0.0	714
960 min Winter	4.332	0.0	944
1440 min Winter	3.118	0.0	1412
2160 min Winter	2.244	0.0	2092
2880 min Winter	1.777	0.0	2740
4320 min Winter	1.363	0.0	3892
5760 min Winter	1.130	0.0	4488
7200 min Winter	0.977	0.0	5408
8640 min Winter	0.867	0.0	6392
10080 min Winter	0.784	0.0	7264

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Rainfall Details

Rainfall Model	FEH
Return Period (years)	10
FEH Rainfall Version	1999
Site Location	GB 498650 101750 SU 98650 01750
C (1km)	-0.025
D1 (1km)	0.390
D2 (1km)	0.245
D3 (1km)	0.403
E (1km)	0.310
F (1km)	2.321
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) 1.150

Porous Car Park Structure

Infiltration Coefficient Base (m/hr)	0.00112	Width (m)	6.0
Membrane Percolation (mm/hr)	1000	Length (m)	43.0
Max Percolation (l/s)	71.7	Slope (1:X)	100.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	0.000	Membrane Depth (m)	260

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

Half Drain Time : 7677 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	0.322	0.322	0.0	9.3	O K
30 min Summer	0.358	0.358	0.0	11.5	O K
60 min Summer	0.397	0.397	0.0	14.2	O K
120 min Summer	0.439	0.439	0.0	17.3	O K
180 min Summer	0.466	0.466	0.0	19.4	O K
240 min Summer	0.487	0.487	0.0	21.0	O K
360 min Summer	0.518	0.518	0.0	23.5	O K
480 min Summer	0.542	0.542	0.0	25.3	O K
600 min Summer	0.561	0.561	0.0	26.8	O K
720 min Summer	0.577	0.577	0.0	28.0	O K
960 min Summer	0.586	0.586	0.0	28.7	O K
1440 min Summer	0.595	0.595	0.0	29.4	O K
2160 min Summer	0.598	0.598	0.0	29.6	O K
2880 min Summer	0.595	0.595	0.0	29.5	O K
4320 min Summer	0.614	0.614	0.0	30.8	O K
5760 min Summer	0.621	0.621	0.0	31.4	O K
7200 min Summer	0.625	0.625	0.0	31.7	O K
8640 min Summer	0.627	0.627	0.0	31.9	O K
10080 min Summer	0.627	0.627	0.0	31.9	O K
15 min Winter	0.343	0.343	0.0	10.6	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	162.161	0.0	19
30 min Summer	98.106	0.0	34
60 min Summer	59.354	0.0	64
120 min Summer	35.909	0.0	124
180 min Summer	26.763	0.0	184
240 min Summer	21.725	0.0	244
360 min Summer	16.191	0.0	364
480 min Summer	13.143	0.0	484
600 min Summer	11.180	0.0	604
720 min Summer	9.796	0.0	724
960 min Summer	7.627	0.0	962
1440 min Summer	5.360	0.0	1442
2160 min Summer	3.767	0.0	2160
2880 min Summer	2.933	0.0	2880
4320 min Summer	2.197	0.0	4320
5760 min Summer	1.790	0.0	5128
7200 min Summer	1.527	0.0	5840
8640 min Summer	1.341	0.0	6656
10080 min Summer	1.202	0.0	7368
15 min Winter	162.161	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	0.381	0.381	0.0	13.1	O K
60 min Winter	0.422	0.422	0.0	16.0	O K
120 min Winter	0.468	0.468	0.0	19.6	O K
180 min Winter	0.498	0.498	0.0	21.9	O K
240 min Winter	0.522	0.522	0.0	23.8	O K
360 min Winter	0.557	0.557	0.0	26.5	O K
480 min Winter	0.584	0.584	0.0	28.6	O K
600 min Winter	0.606	0.606	0.0	30.3	O K
720 min Winter	0.625	0.625	0.0	31.7	O K
960 min Winter	0.635	0.635	0.0	32.5	O K
1440 min Winter	0.646	0.646	0.0	33.4	O K
2160 min Winter	0.652	0.652	0.0	33.8	O K
2880 min Winter	0.652	0.652	0.0	33.8	O K
4320 min Winter	0.677	0.677	0.0	35.7	O K
5760 min Winter	0.688	0.688	0.0	36.6	O K
7200 min Winter	0.692	0.692	0.0	36.9	O K
8640 min Winter	0.691	0.691	0.0	36.9	O K
10080 min Winter	0.691	0.691	0.0	36.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
30 min Winter	98.106	0.0	34
60 min Winter	59.354	0.0	64
120 min Winter	35.909	0.0	124
180 min Winter	26.763	0.0	182
240 min Winter	21.725	0.0	242
360 min Winter	16.191	0.0	360
480 min Winter	13.143	0.0	480
600 min Winter	11.180	0.0	598
720 min Winter	9.796	0.0	716
960 min Winter	7.627	0.0	952
1440 min Winter	5.360	0.0	1426
2160 min Winter	3.767	0.0	2120
2880 min Winter	2.933	0.0	2820
4320 min Winter	2.197	0.0	4152
5760 min Winter	1.790	0.0	5480
7200 min Winter	1.527	0.0	6704
8640 min Winter	1.341	0.0	7176
10080 min Winter	1.202	0.0	7968

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Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	1999
Site Location	GB 498650 101750 SU 98650 01750
C (1km)	-0.025
D1 (1km)	0.390
D2 (1km)	0.245
D3 (1km)	0.403
E (1km)	0.310
F (1km)	2.321
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) 1.150

Porous Car Park Structure

Infiltration Coefficient Base (m/hr)	0.00112	Width (m)	6.0
Membrane Percolation (mm/hr)	1000	Length (m)	43.0
Max Percolation (l/s)	71.7	Slope (1:X)	100.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	0.000	Membrane Depth (m)	260

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STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FEH Rainfall Model

Return Period (years)	100
FEH Rainfall Version	1999
Site Location	GB 498650 101750 SU 98650 01750
C (1km)	-0.025
D1 (1km)	0.390
D2 (1km)	0.245
D3 (1km)	0.403
E (1km)	0.310
F (1km)	2.321
Maximum Rainfall (mm/hr)	50
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)	0.200
Maximum Backdrop Height (m)	1.500
Min Design Depth for Optimisation (m)	1.200
Min Vel for Auto Design only (m/s)	1.00
Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Time Area Diagram for Storm

Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.051	4-8	0.151	8-12	0.048

Total Area Contributing (ha) = 0.249

Total Pipe Volume (m³) = 3.380

Network Design Table for Storm

« - Indicates pipe capacity < flow

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

Network Results Table

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Network Design Table for Storm

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)

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Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S2.000	41.724	0.010	4172.4	0.124	4.00	0.0	0.600	o	150	Pipe/Conduit	
S2.001	56.232	1.090	51.6	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S3.000	32.342	0.010	3234.2	0.075	4.00	0.0	0.600	o	150	Pipe/Conduit	
S3.001	49.684	1.240	40.1	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S2.002	11.269	0.193	58.4	0.050	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)
S2.000	50.00	8.73	6.550	0.124	0.0	0.0	0.0	0.15	2.6«	16.8
S2.001	50.00	9.40	6.540	0.124	0.0	0.0	0.0	1.40	24.8	16.8
S3.000	50.00	7.21	6.350	0.075	0.0	0.0	0.0	0.17	3.0«	10.2
S3.001	50.00	7.73	6.340	0.075	0.0	0.0	0.0	1.59	28.2	10.2
S2.002	50.00	9.54	5.100	0.249	0.0	0.0	0.0	1.32	23.3«	33.7

Simulation Criteria for Storm

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 Storage Structures	3
Number of Online Controls	3	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	1999
Site Location	GB 498650 101750 SU 98650 01750
C (1km)	-0.025
D1 (1km)	0.390
D2 (1km)	0.245
D3 (1km)	0.403
E (1km)	0.310
F (1km)	2.321
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750

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Synthetic Rainfall Details

Cv (Winter)	0.840
Storm Duration (mins)	30

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Online Controls for Storm

Hydro-Brake® Optimum Manhole: STANK 2 HB, DS/PN: S2.001, Volume (m³): 1.3

Unit Reference	MD-SHE-0046-7000-0410-7000
Design Head (m)	0.410
Design Flow (l/s)	0.7
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	46
Invert Level (m)	6.540
Minimum Outlet Pipe Diameter (mm)	75
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.410	0.7
Flush-Flo™	0.120	0.7
Kick-Flo®	0.272	0.6
Mean Flow over Head Range	-	0.6

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	0.7	1.200	1.1	3.000	1.7	7.000	2.6
0.200	0.7	1.400	1.2	3.500	1.8	7.500	2.7
0.300	0.6	1.600	1.3	4.000	1.9	8.000	2.7
0.400	0.7	1.800	1.4	4.500	2.1	8.500	2.8
0.500	0.8	2.000	1.4	5.000	2.2	9.000	2.9
0.600	0.8	2.200	1.5	5.500	2.3	9.500	3.0
0.800	0.9	2.400	1.5	6.000	2.4		
1.000	1.0	2.600	1.6	6.500	2.5		

Hydro-Brake® Optimum Manhole: STANK 1 HB, DS/PN: S3.001, Volume (m³): 1.4

Unit Reference	MD-SHE-0046-7000-0394-7000
Design Head (m)	0.394
Design Flow (l/s)	0.7
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	46
Invert Level (m)	6.340
Minimum Outlet Pipe Diameter (mm)	75
Suggested Manhole Diameter (mm)	1200

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Hydro-Brake® Optimum Manhole: STANK 1 HB, DS/PN: S3.001, Volume (m³): 1.4

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.394	0.7
Flush-Flo™	0.117	0.7
Kick-Flo®	0.266	0.6
Mean Flow over Head Range	-	0.6

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	0.7	1.200	1.1	3.000	1.7	7.000	2.6
0.200	0.7	1.400	1.2	3.500	1.9	7.500	2.7
0.300	0.6	1.600	1.3	4.000	2.0	8.000	2.8
0.400	0.7	1.800	1.4	4.500	2.1	8.500	2.9
0.500	0.8	2.000	1.4	5.000	2.2	9.000	3.0
0.600	0.8	2.200	1.5	5.500	2.3	9.500	3.1
0.800	1.0	2.400	1.6	6.000	2.4		
1.000	1.1	2.600	1.6	6.500	2.5		

Weir Manhole: SCOMPLEX BASIN, DS/PN: S2.002, Volume (m³): 4.5

Discharge Coef 0.544 Width (m) 1.000 Invert Level (m) 7.000

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Storage Structures for Storm

Cellular Storage Manhole: STANK 2, DS/PN: S2.000

Invert Level (m) 6.500 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00112 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	295.0	295.0	0.401	0.0	322.5
0.400	295.0	322.5			

Cellular Storage Manhole: STANK 1, DS/PN: S3.000

Invert Level (m) 6.300 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00112 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	152.0	150.0	0.401	0.0	169.6
0.400	152.0	169.6			

Complex Manhole: SCOMPLEX BASIN, DS/PN: S2.002

Cellular Storage

Invert Level (m) 5.100 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00108 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00108

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	120.0	120.0	0.401	0.0	137.5
0.400	120.0	137.5			

Trench Soakaway

Infiltration Coefficient Base (m/hr) 0.00000 Trench Width (m) 10.0
Infiltration Coefficient Side (m/hr) 0.00918 Trench Length (m) 12.0
Safety Factor 2.0 Slope (1:X) 0.0
Porosity 0.30 Cap Volume Depth (m) 0.600
Invert Level (m) 5.500 Cap Infiltration Depth (m) 0.600

Infiltration Basin

Invert Level (m) 6.100 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 1.00
Infiltration Coefficient Side (m/hr) 0.01728

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Infiltration Basin

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	290.0	1.400	809.0

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ARUN DISTRICT COUNCIL Y/26/21/DOC

10 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

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

Number of Input Hydrographs	0	Number of Storage Structures	3
Number of Online Controls	3	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FEH
FEH Rainfall Version	1999
Site Location	GB 498650 101750 SU 98650 01750
C (1km)	-0.025
D1 (1km)	0.390
D2 (1km)	0.245
D3 (1km)	0.403
E (1km)	0.310
F (1km)	2.321
Cv (Summer)	0.750
Cv (Winter)	0.840

Margin for Flood Risk Warning (mm)	300.0
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)	10, 100
Climate Change (%)	40, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow
S2.000	STANK 2	720 Winter	10	+40%	100/60 Winter		
S2.001	STANK 2 HB	720 Winter	10	+40%	100/60 Winter		
S3.000	STANK 1	720 Winter	10	+40%	100/30 Winter		
S3.001	STANK 1 HB	720 Winter	10	+40%	100/30 Winter		
S2.002	SCOMPLEX BASIN	10080 Winter	10	+40%	10/120 Summer		

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10 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
S2.000	STANK 2		6.679	-0.021	0.000	0.14		742	0.7
S2.001	STANK 2 HB		6.674	-0.016	0.000	0.03			0.7
S3.000	STANK 1		6.479	-0.021	0.000	0.15		455	0.7
S3.001	STANK 1 HB		6.475	-0.015	0.000	0.03			0.7
S2.002	SCOMPLEX BASIN		6.363	1.113	0.000	0.00		10665	0.0

PN	US/MH Name	Status	Level Exceeded
S2.000	STANK 2	OK	
S2.001	STANK 2 HB	OK	
S3.000	STANK 1	OK	
S3.001	STANK 1 HB	OK	
S2.002	SCOMPLEX BASIN	SURCHARGED	

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

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

Number of Input Hydrographs	0	Number of Storage Structures	3
Number of Online Controls	3	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FEH
FEH Rainfall Version	1999
Site Location	GB 498650 101750 SU 98650 01750
C (1km)	-0.025
D1 (1km)	0.390
D2 (1km)	0.245
D3 (1km)	0.403
E (1km)	0.310
F (1km)	2.321
Cv (Summer)	0.750
Cv (Winter)	0.840

Margin for Flood Risk Warning (mm)	300.0
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)	10, 100
Climate Change (%)	40, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow
S2.000	STANK 2	720 Winter	100	+40%	100/60 Winter		
S2.001	STANK 2 HB	720 Winter	100	+40%	100/60 Winter		
S3.000	STANK 1	720 Winter	100	+40%	100/30 Winter		
S3.001	STANK 1 HB	720 Winter	100	+40%	100/30 Winter		
S2.002	SCOMPLEX BASIN	10080 Winter	100	+40%	10/120 Summer		

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
S2.000	STANK 2		6.859	0.159	0.000	0.15		1264	0.8
S2.001	STANK 2 HB		6.854	0.164	0.000	0.03			0.7
S3.000	STANK 1		6.668	0.168	0.000	0.15		717	0.8
S3.001	STANK 1 HB		6.664	0.174	0.000	0.03			0.7
S2.002	SCOMPLEX BASIN		6.543	1.293	0.000	0.00		10249	0.0

PN	US/MH Name	Status	Level Exceeded
S2.000	STANK 2	SURCHARGED	
S2.001	STANK 2 HB	FLOOD RISK	
S3.000	STANK 1	SURCHARGED	
S3.001	STANK 1 HB	SURCHARGED	
S2.002	SCOMPLEX BASIN	SURCHARGED	

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Summary of Results for 10 year Return Period (+40%)

Half Drain Time : 951 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	0.046	0.046	0.0	1.7	O K
30 min Summer	0.057	0.057	0.1	2.2	O K
60 min Summer	0.071	0.071	0.1	2.7	O K
120 min Summer	0.087	0.087	0.1	3.3	O K
180 min Summer	0.097	0.097	0.1	3.7	O K
240 min Summer	0.104	0.104	0.1	4.0	O K
360 min Summer	0.115	0.115	0.1	4.4	O K
480 min Summer	0.121	0.121	0.1	4.6	O K
600 min Summer	0.126	0.126	0.1	4.8	O K
720 min Summer	0.129	0.129	0.1	4.9	O K
960 min Summer	0.127	0.127	0.1	4.8	O K
1440 min Summer	0.123	0.123	0.1	4.7	O K
2160 min Summer	0.115	0.115	0.1	4.4	O K
2880 min Summer	0.107	0.107	0.1	4.1	O K
4320 min Summer	0.101	0.101	0.1	3.8	O K
5760 min Summer	0.094	0.094	0.1	3.6	O K
7200 min Summer	0.086	0.086	0.1	3.3	O K
8640 min Summer	0.079	0.079	0.1	3.0	O K
10080 min Summer	0.072	0.072	0.1	2.7	O K
15 min Winter	0.051	0.051	0.1	1.9	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	72.148	0.0	19
30 min Summer	45.463	0.0	34
60 min Summer	28.648	0.0	64
120 min Summer	18.052	0.0	122
180 min Summer	13.779	0.0	182
240 min Summer	11.375	0.0	242
360 min Summer	8.683	0.0	362
480 min Summer	7.168	0.0	480
600 min Summer	6.178	0.0	600
720 min Summer	5.471	0.0	700
960 min Summer	4.332	0.0	798
1440 min Summer	3.118	0.0	1040
2160 min Summer	2.244	0.0	1448
2880 min Summer	1.777	0.0	1844
4320 min Summer	1.363	0.0	2676
5760 min Summer	1.130	0.0	3456
7200 min Summer	0.977	0.0	4184
8640 min Summer	0.867	0.0	4936
10080 min Summer	0.784	0.0	5648
15 min Winter	72.148	0.0	19

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Summary of Results for 10 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	0.064	0.064	0.1	2.4	O K
60 min Winter	0.079	0.079	0.1	3.0	O K
120 min Winter	0.098	0.098	0.1	3.7	O K
180 min Winter	0.109	0.109	0.1	4.2	O K
240 min Winter	0.118	0.118	0.1	4.5	O K
360 min Winter	0.130	0.130	0.1	4.9	O K
480 min Winter	0.138	0.138	0.1	5.3	O K
600 min Winter	0.144	0.144	0.1	5.5	O K
720 min Winter	0.149	0.149	0.1	5.6	O K
960 min Winter	0.146	0.146	0.1	5.6	O K
1440 min Winter	0.139	0.139	0.1	5.3	O K
2160 min Winter	0.129	0.129	0.1	4.9	O K
2880 min Winter	0.117	0.117	0.1	4.4	O K
4320 min Winter	0.105	0.105	0.1	4.0	O K
5760 min Winter	0.091	0.091	0.1	3.5	O K
7200 min Winter	0.078	0.078	0.1	3.0	O K
8640 min Winter	0.067	0.067	0.1	2.5	O K
10080 min Winter	0.058	0.058	0.1	2.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
30 min Winter	45.463	0.0	33
60 min Winter	28.648	0.0	62
120 min Winter	18.052	0.0	120
180 min Winter	13.779	0.0	180
240 min Winter	11.375	0.0	238
360 min Winter	8.683	0.0	354
480 min Winter	7.168	0.0	468
600 min Winter	6.178	0.0	582
720 min Winter	5.471	0.0	692
960 min Winter	4.332	0.0	904
1440 min Winter	3.118	0.0	1124
2160 min Winter	2.244	0.0	1576
2880 min Winter	1.777	0.0	2016
4320 min Winter	1.363	0.0	2856
5760 min Winter	1.130	0.0	3688
7200 min Winter	0.977	0.0	4400
8640 min Winter	0.867	0.0	5104
10080 min Winter	0.784	0.0	5752

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Rainfall Details

Rainfall Model	FEH
Return Period (years)	10
FEH Rainfall Version	1999
Site Location	GB 498650 101750 SU 98650 01750
C (1km)	-0.025
D1 (1km)	0.390
D2 (1km)	0.245
D3 (1km)	0.403
E (1km)	0.310
F (1km)	2.321
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) 0.013

Time (mins) From:	To:	Area (ha)
0	4	0.013

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Model Details

Storage is Online Cover Level (m) 1.000

Cellular Storage Structure

Invert Level (m) 0.000 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00900 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	0.401	0.0	51.2
0.400	40.0	51.2			

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

Half Drain Time : 1871 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	0.103	0.103	0.1	3.9	O K
30 min Summer	0.124	0.124	0.1	4.7	O K
60 min Summer	0.149	0.149	0.1	5.7	O K
120 min Summer	0.177	0.177	0.1	6.7	O K
180 min Summer	0.195	0.195	0.1	7.4	O K
240 min Summer	0.209	0.209	0.1	7.9	O K
360 min Summer	0.228	0.228	0.1	8.6	O K
480 min Summer	0.241	0.241	0.1	9.1	O K
600 min Summer	0.250	0.250	0.1	9.5	O K
720 min Summer	0.257	0.257	0.1	9.8	O K
960 min Summer	0.254	0.254	0.1	9.7	O K
1440 min Summer	0.242	0.242	0.1	9.2	O K
2160 min Summer	0.225	0.225	0.1	8.6	O K
2880 min Summer	0.211	0.211	0.1	8.0	O K
4320 min Summer	0.203	0.203	0.1	7.7	O K
5760 min Summer	0.193	0.193	0.1	7.3	O K
7200 min Summer	0.182	0.182	0.1	6.9	O K
8640 min Summer	0.171	0.171	0.1	6.5	O K
10080 min Summer	0.159	0.159	0.1	6.1	O K
15 min Winter	0.116	0.116	0.1	4.4	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	162.161	0.0	19
30 min Summer	98.106	0.0	34
60 min Summer	59.354	0.0	64
120 min Summer	35.909	0.0	124
180 min Summer	26.763	0.0	184
240 min Summer	21.725	0.0	242
360 min Summer	16.191	0.0	362
480 min Summer	13.143	0.0	482
600 min Summer	11.180	0.0	602
720 min Summer	9.796	0.0	722
960 min Summer	7.627	0.0	960
1440 min Summer	5.360	0.0	1370
2160 min Summer	3.767	0.0	1668
2880 min Summer	2.933	0.0	2044
4320 min Summer	2.197	0.0	2856
5760 min Summer	1.790	0.0	3696
7200 min Summer	1.527	0.0	4536
8640 min Summer	1.341	0.0	5280
10080 min Summer	1.202	0.0	6056
15 min Winter	162.161	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	0.139	0.139	0.1	5.3	O K
60 min Winter	0.167	0.167	0.1	6.3	O K
120 min Winter	0.199	0.199	0.1	7.6	O K
180 min Winter	0.220	0.220	0.1	8.4	O K
240 min Winter	0.235	0.235	0.1	8.9	O K
360 min Winter	0.257	0.257	0.1	9.8	O K
480 min Winter	0.272	0.272	0.1	10.4	O K
600 min Winter	0.284	0.284	0.1	10.8	O K
720 min Winter	0.293	0.293	0.1	11.1	O K
960 min Winter	0.291	0.291	0.1	11.1	O K
1440 min Winter	0.281	0.281	0.1	10.7	O K
2160 min Winter	0.260	0.260	0.1	9.9	O K
2880 min Winter	0.242	0.242	0.1	9.2	O K
4320 min Winter	0.229	0.229	0.1	8.7	O K
5760 min Winter	0.211	0.211	0.1	8.0	O K
7200 min Winter	0.193	0.193	0.1	7.3	O K
8640 min Winter	0.174	0.174	0.1	6.6	O K
10080 min Winter	0.156	0.156	0.1	5.9	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
30 min Winter	98.106	0.0	34
60 min Winter	59.354	0.0	64
120 min Winter	35.909	0.0	122
180 min Winter	26.763	0.0	180
240 min Winter	21.725	0.0	240
360 min Winter	16.191	0.0	358
480 min Winter	13.143	0.0	474
600 min Winter	11.180	0.0	592
720 min Winter	9.796	0.0	708
960 min Winter	7.627	0.0	936
1440 min Winter	5.360	0.0	1384
2160 min Winter	3.767	0.0	1964
2880 min Winter	2.933	0.0	2216
4320 min Winter	2.197	0.0	3152
5760 min Winter	1.790	0.0	4032
7200 min Winter	1.527	0.0	4896
8640 min Winter	1.341	0.0	5712
10080 min Winter	1.202	0.0	6552

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Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	1999
Site Location	GB 498650 101750 SU 98650 01750
C (1km)	-0.025
D1 (1km)	0.390
D2 (1km)	0.245
D3 (1km)	0.403
E (1km)	0.310
F (1km)	2.321
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) 0.013

Time (mins) From:	To:	Area (ha)
0	4	0.013

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Model Details

Storage is Online Cover Level (m) 1.000

Cellular Storage Structure

Invert Level (m) 0.000 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00900 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	0.401	0.0	51.2
0.400	40.0	51.2			

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Summary of Results for 10 year Return Period (+40%)

Half Drain Time : 924 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	0.045	0.045	0.0	1.9	O K
30 min Summer	0.056	0.056	0.1	2.3	O K
60 min Summer	0.069	0.069	0.1	2.9	O K
120 min Summer	0.085	0.085	0.1	3.5	O K
180 min Summer	0.095	0.095	0.1	4.0	O K
240 min Summer	0.102	0.102	0.1	4.3	O K
360 min Summer	0.112	0.112	0.1	4.7	O K
480 min Summer	0.118	0.118	0.1	4.9	O K
600 min Summer	0.123	0.123	0.1	5.1	O K
720 min Summer	0.126	0.126	0.1	5.3	O K
960 min Summer	0.124	0.124	0.1	5.2	O K
1440 min Summer	0.120	0.120	0.1	5.0	O K
2160 min Summer	0.112	0.112	0.1	4.7	O K
2880 min Summer	0.104	0.104	0.1	4.4	O K
4320 min Summer	0.098	0.098	0.1	4.1	O K
5760 min Summer	0.091	0.091	0.1	3.8	O K
7200 min Summer	0.083	0.083	0.1	3.5	O K
8640 min Summer	0.076	0.076	0.1	3.2	O K
10080 min Summer	0.070	0.070	0.1	2.9	O K
15 min Winter	0.050	0.050	0.1	2.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	72.148	0.0	19
30 min Summer	45.463	0.0	33
60 min Summer	28.648	0.0	64
120 min Summer	18.052	0.0	122
180 min Summer	13.779	0.0	182
240 min Summer	11.375	0.0	242
360 min Summer	8.683	0.0	362
480 min Summer	7.168	0.0	480
600 min Summer	6.178	0.0	600
720 min Summer	5.471	0.0	686
960 min Summer	4.332	0.0	790
1440 min Summer	3.118	0.0	1038
2160 min Summer	2.244	0.0	1432
2880 min Summer	1.777	0.0	1844
4320 min Summer	1.363	0.0	2640
5760 min Summer	1.130	0.0	3456
7200 min Summer	0.977	0.0	4184
8640 min Summer	0.867	0.0	4928
10080 min Summer	0.784	0.0	5648
15 min Winter	72.148	0.0	19

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Summary of Results for 10 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	0.062	0.062	0.1	2.6	O K
60 min Winter	0.078	0.078	0.1	3.2	O K
120 min Winter	0.095	0.095	0.1	4.0	O K
180 min Winter	0.107	0.107	0.1	4.5	O K
240 min Winter	0.115	0.115	0.1	4.8	O K
360 min Winter	0.127	0.127	0.1	5.3	O K
480 min Winter	0.135	0.135	0.1	5.6	O K
600 min Winter	0.141	0.141	0.1	5.9	O K
720 min Winter	0.145	0.145	0.1	6.1	O K
960 min Winter	0.142	0.142	0.1	5.9	O K
1440 min Winter	0.136	0.136	0.1	5.7	O K
2160 min Winter	0.125	0.125	0.1	5.2	O K
2880 min Winter	0.113	0.113	0.1	4.7	O K
4320 min Winter	0.101	0.101	0.1	4.2	O K
5760 min Winter	0.088	0.088	0.1	3.7	O K
7200 min Winter	0.075	0.075	0.1	3.1	O K
8640 min Winter	0.064	0.064	0.1	2.7	O K
10080 min Winter	0.055	0.055	0.1	2.3	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
30 min Winter	45.463	0.0	33
60 min Winter	28.648	0.0	62
120 min Winter	18.052	0.0	120
180 min Winter	13.779	0.0	180
240 min Winter	11.375	0.0	238
360 min Winter	8.683	0.0	354
480 min Winter	7.168	0.0	468
600 min Winter	6.178	0.0	580
720 min Winter	5.471	0.0	692
960 min Winter	4.332	0.0	902
1440 min Winter	3.118	0.0	1112
2160 min Winter	2.244	0.0	1576
2880 min Winter	1.777	0.0	2016
4320 min Winter	1.363	0.0	2856
5760 min Winter	1.130	0.0	3640
7200 min Winter	0.977	0.0	4400
8640 min Winter	0.867	0.0	5096
10080 min Winter	0.784	0.0	5744

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Rainfall Details

Rainfall Model	FEH
Return Period (years)	10
FEH Rainfall Version	1999
Site Location	GB 498650 101750 SU 98650 01750
C (1km)	-0.025
D1 (1km)	0.390
D2 (1km)	0.245
D3 (1km)	0.403
E (1km)	0.310
F (1km)	2.321
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) 0.014

Time (mins) From:	To:	Area (ha)
0	4	0.014

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Model Details

Storage is Online Cover Level (m) 1.000

Cellular Storage Structure

Invert Level (m) 0.000 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00900 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	44.0	44.0	0.401	0.0	56.0
0.400	44.0	56.0			

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

Half Drain Time : 1824 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	0.101	0.101	0.1	4.2	O K
30 min Summer	0.121	0.121	0.1	5.1	O K
60 min Summer	0.146	0.146	0.1	6.1	O K
120 min Summer	0.173	0.173	0.1	7.2	O K
180 min Summer	0.191	0.191	0.1	8.0	O K
240 min Summer	0.204	0.204	0.1	8.5	O K
360 min Summer	0.222	0.222	0.1	9.3	O K
480 min Summer	0.235	0.235	0.1	9.8	O K
600 min Summer	0.244	0.244	0.1	10.2	O K
720 min Summer	0.251	0.251	0.1	10.5	O K
960 min Summer	0.248	0.248	0.1	10.4	O K
1440 min Summer	0.236	0.236	0.1	9.9	O K
2160 min Summer	0.219	0.219	0.1	9.2	O K
2880 min Summer	0.205	0.205	0.1	8.6	O K
4320 min Summer	0.197	0.197	0.1	8.2	O K
5760 min Summer	0.187	0.187	0.1	7.8	O K
7200 min Summer	0.176	0.176	0.1	7.3	O K
8640 min Summer	0.165	0.165	0.1	6.9	O K
10080 min Summer	0.153	0.153	0.1	6.4	O K
15 min Winter	0.113	0.113	0.1	4.7	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	162.161	0.0	19
30 min Summer	98.106	0.0	34
60 min Summer	59.354	0.0	64
120 min Summer	35.909	0.0	124
180 min Summer	26.763	0.0	184
240 min Summer	21.725	0.0	242
360 min Summer	16.191	0.0	362
480 min Summer	13.143	0.0	482
600 min Summer	11.180	0.0	602
720 min Summer	9.796	0.0	722
960 min Summer	7.627	0.0	960
1440 min Summer	5.360	0.0	1342
2160 min Summer	3.767	0.0	1664
2880 min Summer	2.933	0.0	2020
4320 min Summer	2.197	0.0	2856
5760 min Summer	1.790	0.0	3688
7200 min Summer	1.527	0.0	4472
8640 min Summer	1.341	0.0	5280
10080 min Summer	1.202	0.0	6056
15 min Winter	162.161	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	0.136	0.136	0.1	5.7	O K
60 min Winter	0.163	0.163	0.1	6.8	O K
120 min Winter	0.195	0.195	0.1	8.1	O K
180 min Winter	0.215	0.215	0.1	9.0	O K
240 min Winter	0.230	0.230	0.1	9.6	O K
360 min Winter	0.251	0.251	0.1	10.5	O K
480 min Winter	0.266	0.266	0.1	11.1	O K
600 min Winter	0.277	0.277	0.1	11.6	O K
720 min Winter	0.286	0.286	0.1	12.0	O K
960 min Winter	0.284	0.284	0.1	11.9	O K
1440 min Winter	0.274	0.274	0.1	11.4	O K
2160 min Winter	0.252	0.252	0.1	10.5	O K
2880 min Winter	0.235	0.235	0.1	9.8	O K
4320 min Winter	0.221	0.221	0.1	9.2	O K
5760 min Winter	0.204	0.204	0.1	8.5	O K
7200 min Winter	0.185	0.185	0.1	7.7	O K
8640 min Winter	0.167	0.167	0.1	7.0	O K
10080 min Winter	0.148	0.148	0.1	6.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
30 min Winter	98.106	0.0	34
60 min Winter	59.354	0.0	64
120 min Winter	35.909	0.0	122
180 min Winter	26.763	0.0	180
240 min Winter	21.725	0.0	240
360 min Winter	16.191	0.0	358
480 min Winter	13.143	0.0	474
600 min Winter	11.180	0.0	590
720 min Winter	9.796	0.0	708
960 min Winter	7.627	0.0	934
1440 min Winter	5.360	0.0	1382
2160 min Winter	3.767	0.0	1812
2880 min Winter	2.933	0.0	2192
4320 min Winter	2.197	0.0	3116
5760 min Winter	1.790	0.0	4032
7200 min Winter	1.527	0.0	4896
8640 min Winter	1.341	0.0	5704
10080 min Winter	1.202	0.0	6464

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Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	1999
Site Location	GB 498650 101750 SU 98650 01750
C (1km)	-0.025
D1 (1km)	0.390
D2 (1km)	0.245
D3 (1km)	0.403
E (1km)	0.310
F (1km)	2.321
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) 0.014

Time (mins) From:	To:	Area (ha)
0	4	0.014

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Model Details

Storage is Online Cover Level (m) 1.000

Cellular Storage Structure

Invert Level (m) 0.000 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00900 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	44.0	44.0	0.401	0.0	56.0
0.400	44.0	56.0			

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Summary of Results for 10 year Return Period (+40%)

Half Drain Time : 1513 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	0.046	0.046	0.0	1.7	O K
30 min Summer	0.057	0.057	0.0	2.2	O K
60 min Summer	0.071	0.071	0.0	2.7	O K
120 min Summer	0.088	0.088	0.0	3.4	O K
180 min Summer	0.100	0.100	0.0	3.8	O K
240 min Summer	0.108	0.108	0.0	4.1	O K
360 min Summer	0.121	0.121	0.0	4.6	O K
480 min Summer	0.129	0.129	0.0	4.9	O K
600 min Summer	0.136	0.136	0.0	5.2	O K
720 min Summer	0.141	0.141	0.0	5.4	O K
960 min Summer	0.142	0.142	0.0	5.4	O K
1440 min Summer	0.139	0.139	0.0	5.3	O K
2160 min Summer	0.134	0.134	0.0	5.1	O K
2880 min Summer	0.129	0.129	0.0	4.9	O K
4320 min Summer	0.129	0.129	0.0	4.9	O K
5760 min Summer	0.125	0.125	0.0	4.8	O K
7200 min Summer	0.121	0.121	0.0	4.6	O K
8640 min Summer	0.116	0.116	0.0	4.4	O K
10080 min Summer	0.110	0.110	0.0	4.2	O K
15 min Winter	0.051	0.051	0.0	1.9	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	72.148	0.0	19
30 min Summer	45.463	0.0	34
60 min Summer	28.648	0.0	64
120 min Summer	18.052	0.0	124
180 min Summer	13.779	0.0	182
240 min Summer	11.375	0.0	242
360 min Summer	8.683	0.0	362
480 min Summer	7.168	0.0	482
600 min Summer	6.178	0.0	602
720 min Summer	5.471	0.0	722
960 min Summer	4.332	0.0	960
1440 min Summer	3.118	0.0	1226
2160 min Summer	2.244	0.0	1596
2880 min Summer	1.777	0.0	1988
4320 min Summer	1.363	0.0	2812
5760 min Summer	1.130	0.0	3640
7200 min Summer	0.977	0.0	4472
8640 min Summer	0.867	0.0	5272
10080 min Summer	0.784	0.0	6056
15 min Winter	72.148	0.0	19

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Summary of Results for 10 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	0.064	0.064	0.0	2.4	O K
60 min Winter	0.080	0.080	0.0	3.0	O K
120 min Winter	0.100	0.100	0.0	3.8	O K
180 min Winter	0.112	0.112	0.0	4.3	O K
240 min Winter	0.122	0.122	0.0	4.6	O K
360 min Winter	0.136	0.136	0.0	5.2	O K
480 min Winter	0.147	0.147	0.0	5.6	O K
600 min Winter	0.155	0.155	0.0	5.9	O K
720 min Winter	0.161	0.161	0.0	6.1	O K
960 min Winter	0.162	0.162	0.0	6.2	O K
1440 min Winter	0.160	0.160	0.0	6.1	O K
2160 min Winter	0.153	0.153	0.0	5.8	O K
2880 min Winter	0.146	0.146	0.0	5.5	O K
4320 min Winter	0.142	0.142	0.0	5.4	O K
5760 min Winter	0.135	0.135	0.0	5.1	O K
7200 min Winter	0.126	0.126	0.0	4.8	O K
8640 min Winter	0.117	0.117	0.0	4.4	O K
10080 min Winter	0.107	0.107	0.0	4.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
30 min Winter	45.463	0.0	33
60 min Winter	28.648	0.0	62
120 min Winter	18.052	0.0	122
180 min Winter	13.779	0.0	180
240 min Winter	11.375	0.0	240
360 min Winter	8.683	0.0	356
480 min Winter	7.168	0.0	472
600 min Winter	6.178	0.0	590
720 min Winter	5.471	0.0	704
960 min Winter	4.332	0.0	932
1440 min Winter	3.118	0.0	1368
2160 min Winter	2.244	0.0	1708
2880 min Winter	1.777	0.0	2160
4320 min Winter	1.363	0.0	3072
5760 min Winter	1.130	0.0	3976
7200 min Winter	0.977	0.0	4832
8640 min Winter	0.867	0.0	5624
10080 min Winter	0.784	0.0	6456

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Rainfall Details

Rainfall Model	FEH
Return Period (years)	10
FEH Rainfall Version	1999
Site Location	GB 498650 101750 SU 98650 01750
C (1km)	-0.025
D1 (1km)	0.390
D2 (1km)	0.245
D3 (1km)	0.403
E (1km)	0.310
F (1km)	2.321
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) 0.013

Time (mins) From:	To:	Area (ha)
0	4	0.013

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Model Details

Storage is Online Cover Level (m) 1.000

Cellular Storage Structure

Invert Level (m) 0.000 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00612 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	0.401	0.0	51.2
0.400	40.0	51.2			

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

Half Drain Time : 2892 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	0.103	0.103	0.0	3.9	O K
30 min Summer	0.125	0.125	0.0	4.7	O K
60 min Summer	0.150	0.150	0.0	5.7	O K
120 min Summer	0.180	0.180	0.0	6.8	O K
180 min Summer	0.199	0.199	0.0	7.6	O K
240 min Summer	0.213	0.213	0.0	8.1	O K
360 min Summer	0.234	0.234	0.0	8.9	O K
480 min Summer	0.250	0.250	0.0	9.5	O K
600 min Summer	0.262	0.262	0.0	9.9	O K
720 min Summer	0.271	0.271	0.0	10.3	O K
960 min Summer	0.272	0.272	0.0	10.4	O K
1440 min Summer	0.269	0.269	0.0	10.2	O K
2160 min Summer	0.257	0.257	0.0	9.8	O K
2880 min Summer	0.245	0.245	0.0	9.3	O K
4320 min Summer	0.244	0.244	0.0	9.3	O K
5760 min Summer	0.240	0.240	0.0	9.1	O K
7200 min Summer	0.234	0.234	0.0	8.9	O K
8640 min Summer	0.227	0.227	0.0	8.6	O K
10080 min Summer	0.220	0.220	0.0	8.4	O K
15 min Winter	0.116	0.116	0.0	4.4	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	162.161	0.0	19
30 min Summer	98.106	0.0	34
60 min Summer	59.354	0.0	64
120 min Summer	35.909	0.0	124
180 min Summer	26.763	0.0	184
240 min Summer	21.725	0.0	244
360 min Summer	16.191	0.0	364
480 min Summer	13.143	0.0	482
600 min Summer	11.180	0.0	602
720 min Summer	9.796	0.0	722
960 min Summer	7.627	0.0	962
1440 min Summer	5.360	0.0	1442
2160 min Summer	3.767	0.0	2100
2880 min Summer	2.933	0.0	2388
4320 min Summer	2.197	0.0	3156
5760 min Summer	1.790	0.0	3976
7200 min Summer	1.527	0.0	4824
8640 min Summer	1.341	0.0	5624
10080 min Summer	1.202	0.0	6456
15 min Winter	162.161	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	0.140	0.140	0.0	5.3	O K
60 min Winter	0.168	0.168	0.0	6.4	O K
120 min Winter	0.201	0.201	0.0	7.7	O K
180 min Winter	0.223	0.223	0.0	8.5	O K
240 min Winter	0.240	0.240	0.0	9.1	O K
360 min Winter	0.264	0.264	0.0	10.0	O K
480 min Winter	0.282	0.282	0.0	10.7	O K
600 min Winter	0.296	0.296	0.0	11.2	O K
720 min Winter	0.307	0.307	0.0	11.7	O K
960 min Winter	0.310	0.310	0.0	11.8	O K
1440 min Winter	0.308	0.308	0.0	11.7	O K
2160 min Winter	0.298	0.298	0.0	11.3	O K
2880 min Winter	0.284	0.284	0.0	10.8	O K
4320 min Winter	0.281	0.281	0.0	10.7	O K
5760 min Winter	0.274	0.274	0.0	10.4	O K
7200 min Winter	0.264	0.264	0.0	10.0	O K
8640 min Winter	0.253	0.253	0.0	9.6	O K
10080 min Winter	0.240	0.240	0.0	9.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
30 min Winter	98.106	0.0	34
60 min Winter	59.354	0.0	64
120 min Winter	35.909	0.0	122
180 min Winter	26.763	0.0	182
240 min Winter	21.725	0.0	240
360 min Winter	16.191	0.0	358
480 min Winter	13.143	0.0	478
600 min Winter	11.180	0.0	596
720 min Winter	9.796	0.0	712
960 min Winter	7.627	0.0	944
1440 min Winter	5.360	0.0	1402
2160 min Winter	3.767	0.0	2076
2880 min Winter	2.933	0.0	2708
4320 min Winter	2.197	0.0	3376
5760 min Winter	1.790	0.0	4328
7200 min Winter	1.527	0.0	5256
8640 min Winter	1.341	0.0	6144
10080 min Winter	1.202	0.0	7056

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Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	1999
Site Location	GB 498650 101750 SU 98650 01750
C (1km)	-0.025
D1 (1km)	0.390
D2 (1km)	0.245
D3 (1km)	0.403
E (1km)	0.310
F (1km)	2.321
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) 0.013

Time (mins) From:	To:	Area (ha)
0	4	0.013

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Model Details

Storage is Online Cover Level (m) 1.000

Cellular Storage Structure

Invert Level (m) 0.000 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00612 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	0.401	0.0	51.2
0.400	40.0	51.2			

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Summary of Results for 10 year Return Period (+40%)

Half Drain Time : 1453 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	0.044	0.044	0.0	1.3	O K
30 min Summer	0.055	0.055	0.0	1.7	O K
60 min Summer	0.069	0.069	0.0	2.1	O K
120 min Summer	0.085	0.085	0.0	2.6	O K
180 min Summer	0.096	0.096	0.0	2.9	O K
240 min Summer	0.104	0.104	0.0	3.2	O K
360 min Summer	0.116	0.116	0.0	3.5	O K
480 min Summer	0.124	0.124	0.0	3.8	O K
600 min Summer	0.130	0.130	0.0	4.0	O K
720 min Summer	0.135	0.135	0.0	4.1	O K
960 min Summer	0.135	0.135	0.0	4.1	O K
1440 min Summer	0.132	0.132	0.0	4.0	O K
2160 min Summer	0.128	0.128	0.0	3.9	O K
2880 min Summer	0.123	0.123	0.0	3.7	O K
4320 min Summer	0.122	0.122	0.0	3.7	O K
5760 min Summer	0.118	0.118	0.0	3.6	O K
7200 min Summer	0.114	0.114	0.0	3.5	O K
8640 min Summer	0.109	0.109	0.0	3.3	O K
10080 min Summer	0.103	0.103	0.0	3.1	O K
15 min Winter	0.049	0.049	0.0	1.5	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	72.148	0.0	19
30 min Summer	45.463	0.0	34
60 min Summer	28.648	0.0	64
120 min Summer	18.052	0.0	124
180 min Summer	13.779	0.0	182
240 min Summer	11.375	0.0	242
360 min Summer	8.683	0.0	362
480 min Summer	7.168	0.0	482
600 min Summer	6.178	0.0	602
720 min Summer	5.471	0.0	722
960 min Summer	4.332	0.0	960
1440 min Summer	3.118	0.0	1210
2160 min Summer	2.244	0.0	1560
2880 min Summer	1.777	0.0	1964
4320 min Summer	1.363	0.0	2808
5760 min Summer	1.130	0.0	3632
7200 min Summer	0.977	0.0	4464
8640 min Summer	0.867	0.0	5264
10080 min Summer	0.784	0.0	6048
15 min Winter	72.148	0.0	19

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Summary of Results for 10 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	0.062	0.062	0.0	1.9	O K
60 min Winter	0.077	0.077	0.0	2.3	O K
120 min Winter	0.096	0.096	0.0	2.9	O K
180 min Winter	0.108	0.108	0.0	3.3	O K
240 min Winter	0.117	0.117	0.0	3.6	O K
360 min Winter	0.131	0.131	0.0	4.0	O K
480 min Winter	0.140	0.140	0.0	4.3	O K
600 min Winter	0.148	0.148	0.0	4.5	O K
720 min Winter	0.154	0.154	0.0	4.7	O K
960 min Winter	0.155	0.155	0.0	4.7	O K
1440 min Winter	0.152	0.152	0.0	4.6	O K
2160 min Winter	0.145	0.145	0.0	4.4	O K
2880 min Winter	0.138	0.138	0.0	4.2	O K
4320 min Winter	0.134	0.134	0.0	4.1	O K
5760 min Winter	0.127	0.127	0.0	3.8	O K
7200 min Winter	0.118	0.118	0.0	3.6	O K
8640 min Winter	0.108	0.108	0.0	3.3	O K
10080 min Winter	0.099	0.099	0.0	3.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
30 min Winter	45.463	0.0	33
60 min Winter	28.648	0.0	62
120 min Winter	18.052	0.0	122
180 min Winter	13.779	0.0	180
240 min Winter	11.375	0.0	240
360 min Winter	8.683	0.0	356
480 min Winter	7.168	0.0	472
600 min Winter	6.178	0.0	588
720 min Winter	5.471	0.0	702
960 min Winter	4.332	0.0	930
1440 min Winter	3.118	0.0	1356
2160 min Winter	2.244	0.0	1688
2880 min Winter	1.777	0.0	2136
4320 min Winter	1.363	0.0	3068
5760 min Winter	1.130	0.0	3928
7200 min Winter	0.977	0.0	4824
8640 min Winter	0.867	0.0	5616
10080 min Winter	0.784	0.0	6360

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Rainfall Details

Rainfall Model	FEH
Return Period (years)	10
FEH Rainfall Version	1999
Site Location	GB 498650 101750 SU 98650 01750
C (1km)	-0.025
D1 (1km)	0.390
D2 (1km)	0.245
D3 (1km)	0.403
E (1km)	0.310
F (1km)	2.321
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) 0.010

Time (mins) From:	To:	Area (ha)
0	4	0.010

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Model Details

Storage is Online Cover Level (m) 1.000

Cellular Storage Structure

Invert Level (m) 0.000 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00612 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	32.0	32.0	0.401	0.0	41.6
0.400	32.0	41.6			

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

Half Drain Time : 2763 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	0.099	0.099	0.0	3.0	O K
30 min Summer	0.120	0.120	0.0	3.6	O K
60 min Summer	0.144	0.144	0.0	4.4	O K
120 min Summer	0.172	0.172	0.0	5.2	O K
180 min Summer	0.191	0.191	0.0	5.8	O K
240 min Summer	0.205	0.205	0.0	6.2	O K
360 min Summer	0.225	0.225	0.0	6.8	O K
480 min Summer	0.240	0.240	0.0	7.3	O K
600 min Summer	0.251	0.251	0.0	7.6	O K
720 min Summer	0.260	0.260	0.0	7.9	O K
960 min Summer	0.261	0.261	0.0	7.9	O K
1440 min Summer	0.257	0.257	0.0	7.8	O K
2160 min Summer	0.245	0.245	0.0	7.4	O K
2880 min Summer	0.233	0.233	0.0	7.1	O K
4320 min Summer	0.232	0.232	0.0	7.0	O K
5760 min Summer	0.227	0.227	0.0	6.9	O K
7200 min Summer	0.221	0.221	0.0	6.7	O K
8640 min Summer	0.214	0.214	0.0	6.5	O K
10080 min Summer	0.207	0.207	0.0	6.3	O K
15 min Winter	0.111	0.111	0.0	3.4	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	162.161	0.0	19
30 min Summer	98.106	0.0	34
60 min Summer	59.354	0.0	64
120 min Summer	35.909	0.0	124
180 min Summer	26.763	0.0	184
240 min Summer	21.725	0.0	244
360 min Summer	16.191	0.0	362
480 min Summer	13.143	0.0	482
600 min Summer	11.180	0.0	602
720 min Summer	9.796	0.0	722
960 min Summer	7.627	0.0	962
1440 min Summer	5.360	0.0	1440
2160 min Summer	3.767	0.0	2052
2880 min Summer	2.933	0.0	2336
4320 min Summer	2.197	0.0	3112
5760 min Summer	1.790	0.0	3928
7200 min Summer	1.527	0.0	4760
8640 min Summer	1.341	0.0	5616
10080 min Summer	1.202	0.0	6448
15 min Winter	162.161	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	0.134	0.134	0.0	4.1	O K
60 min Winter	0.162	0.162	0.0	4.9	O K
120 min Winter	0.194	0.194	0.0	5.9	O K
180 min Winter	0.215	0.215	0.0	6.5	O K
240 min Winter	0.230	0.230	0.0	7.0	O K
360 min Winter	0.253	0.253	0.0	7.7	O K
480 min Winter	0.270	0.270	0.0	8.2	O K
600 min Winter	0.284	0.284	0.0	8.6	O K
720 min Winter	0.294	0.294	0.0	8.9	O K
960 min Winter	0.296	0.296	0.0	9.0	O K
1440 min Winter	0.294	0.294	0.0	9.0	O K
2160 min Winter	0.284	0.284	0.0	8.6	O K
2880 min Winter	0.270	0.270	0.0	8.2	O K
4320 min Winter	0.266	0.266	0.0	8.1	O K
5760 min Winter	0.259	0.259	0.0	7.9	O K
7200 min Winter	0.249	0.249	0.0	7.6	O K
8640 min Winter	0.237	0.237	0.0	7.2	O K
10080 min Winter	0.224	0.224	0.0	6.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
30 min Winter	98.106	0.0	34
60 min Winter	59.354	0.0	64
120 min Winter	35.909	0.0	122
180 min Winter	26.763	0.0	182
240 min Winter	21.725	0.0	240
360 min Winter	16.191	0.0	358
480 min Winter	13.143	0.0	476
600 min Winter	11.180	0.0	596
720 min Winter	9.796	0.0	712
960 min Winter	7.627	0.0	944
1440 min Winter	5.360	0.0	1400
2160 min Winter	3.767	0.0	2072
2880 min Winter	2.933	0.0	2684
4320 min Winter	2.197	0.0	3368
5760 min Winter	1.790	0.0	4272
7200 min Winter	1.527	0.0	5192
8640 min Winter	1.341	0.0	6136
10080 min Winter	1.202	0.0	6960

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Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	1999
Site Location	GB 498650 101750 SU 98650 01750
C (1km)	-0.025
D1 (1km)	0.390
D2 (1km)	0.245
D3 (1km)	0.403
E (1km)	0.310
F (1km)	2.321
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) 0.010

Time (mins) From:	To:	Area (ha)
0	4	0.010

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Model Details

Storage is Online Cover Level (m) 1.000

Cellular Storage Structure

Invert Level (m) 0.000 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00612 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	32.0	32.0	0.401	0.0	41.6
0.400	32.0	41.6			

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Summary of Results for 10 year Return Period (+40%)

Half Drain Time : 1445 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	0.044	0.044	0.0	1.9	O K
30 min Summer	0.055	0.055	0.0	2.3	O K
60 min Summer	0.068	0.068	0.0	2.9	O K
120 min Summer	0.085	0.085	0.0	3.6	O K
180 min Summer	0.095	0.095	0.0	4.1	O K
240 min Summer	0.103	0.103	0.0	4.4	O K
360 min Summer	0.115	0.115	0.0	4.9	O K
480 min Summer	0.123	0.123	0.0	5.3	O K
600 min Summer	0.130	0.130	0.0	5.5	O K
720 min Summer	0.134	0.134	0.0	5.7	O K
960 min Summer	0.134	0.134	0.0	5.7	O K
1440 min Summer	0.132	0.132	0.0	5.6	O K
2160 min Summer	0.127	0.127	0.0	5.4	O K
2880 min Summer	0.122	0.122	0.0	5.2	O K
4320 min Summer	0.121	0.121	0.0	5.2	O K
5760 min Summer	0.118	0.118	0.0	5.0	O K
7200 min Summer	0.113	0.113	0.0	4.8	O K
8640 min Summer	0.108	0.108	0.0	4.6	O K
10080 min Summer	0.102	0.102	0.0	4.4	O K
15 min Winter	0.049	0.049	0.0	2.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	72.148	0.0	19
30 min Summer	45.463	0.0	34
60 min Summer	28.648	0.0	64
120 min Summer	18.052	0.0	124
180 min Summer	13.779	0.0	182
240 min Summer	11.375	0.0	242
360 min Summer	8.683	0.0	362
480 min Summer	7.168	0.0	482
600 min Summer	6.178	0.0	602
720 min Summer	5.471	0.0	722
960 min Summer	4.332	0.0	960
1440 min Summer	3.118	0.0	1200
2160 min Summer	2.244	0.0	1560
2880 min Summer	1.777	0.0	1960
4320 min Summer	1.363	0.0	2808
5760 min Summer	1.130	0.0	3632
7200 min Summer	0.977	0.0	4464
8640 min Summer	0.867	0.0	5264
10080 min Summer	0.784	0.0	6048
15 min Winter	72.148	0.0	19

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Summary of Results for 10 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	0.062	0.062	0.0	2.6	O K
60 min Winter	0.077	0.077	0.0	3.3	O K
120 min Winter	0.095	0.095	0.0	4.1	O K
180 min Winter	0.107	0.107	0.0	4.6	O K
240 min Winter	0.116	0.116	0.0	5.0	O K
360 min Winter	0.130	0.130	0.0	5.6	O K
480 min Winter	0.140	0.140	0.0	6.0	O K
600 min Winter	0.147	0.147	0.0	6.3	O K
720 min Winter	0.153	0.153	0.0	6.5	O K
960 min Winter	0.154	0.154	0.0	6.6	O K
1440 min Winter	0.151	0.151	0.0	6.5	O K
2160 min Winter	0.144	0.144	0.0	6.2	O K
2880 min Winter	0.137	0.137	0.0	5.9	O K
4320 min Winter	0.133	0.133	0.0	5.7	O K
5760 min Winter	0.126	0.126	0.0	5.4	O K
7200 min Winter	0.117	0.117	0.0	5.0	O K
8640 min Winter	0.107	0.107	0.0	4.6	O K
10080 min Winter	0.098	0.098	0.0	4.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
30 min Winter	45.463	0.0	33
60 min Winter	28.648	0.0	62
120 min Winter	18.052	0.0	122
180 min Winter	13.779	0.0	180
240 min Winter	11.375	0.0	240
360 min Winter	8.683	0.0	356
480 min Winter	7.168	0.0	472
600 min Winter	6.178	0.0	588
720 min Winter	5.471	0.0	702
960 min Winter	4.332	0.0	930
1440 min Winter	3.118	0.0	1356
2160 min Winter	2.244	0.0	1688
2880 min Winter	1.777	0.0	2136
4320 min Winter	1.363	0.0	3068
5760 min Winter	1.130	0.0	3928
7200 min Winter	0.977	0.0	4824
8640 min Winter	0.867	0.0	5616
10080 min Winter	0.784	0.0	6360

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Rainfall Details

Rainfall Model	FEH
Return Period (years)	10
FEH Rainfall Version	1999
Site Location	GB 498650 101750 SU 98650 01750
C (1km)	-0.025
D1 (1km)	0.390
D2 (1km)	0.245
D3 (1km)	0.403
E (1km)	0.310
F (1km)	2.321
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) 0.014

Time (mins) From:	To:	Area (ha)
0	4	0.014

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Model Details

Storage is Online Cover Level (m) 1.000

Cellular Storage Structure

Invert Level (m) 0.000 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00612 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	45.0	45.0	0.401	0.0	56.2
0.400	45.0	56.2			

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

Half Drain Time : 2748 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	0.099	0.099	0.0	4.2	O K
30 min Summer	0.119	0.119	0.0	5.1	O K
60 min Summer	0.143	0.143	0.0	6.1	O K
120 min Summer	0.172	0.172	0.0	7.3	O K
180 min Summer	0.190	0.190	0.0	8.1	O K
240 min Summer	0.204	0.204	0.0	8.7	O K
360 min Summer	0.224	0.224	0.0	9.6	O K
480 min Summer	0.238	0.238	0.0	10.2	O K
600 min Summer	0.250	0.250	0.0	10.7	O K
720 min Summer	0.259	0.259	0.0	11.1	O K
960 min Summer	0.259	0.259	0.0	11.1	O K
1440 min Summer	0.256	0.256	0.0	10.9	O K
2160 min Summer	0.243	0.243	0.0	10.4	O K
2880 min Summer	0.232	0.232	0.0	9.9	O K
4320 min Summer	0.231	0.231	0.0	9.9	O K
5760 min Summer	0.226	0.226	0.0	9.7	O K
7200 min Summer	0.220	0.220	0.0	9.4	O K
8640 min Summer	0.213	0.213	0.0	9.1	O K
10080 min Summer	0.205	0.205	0.0	8.8	O K
15 min Winter	0.111	0.111	0.0	4.7	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	162.161	0.0	19
30 min Summer	98.106	0.0	34
60 min Summer	59.354	0.0	64
120 min Summer	35.909	0.0	124
180 min Summer	26.763	0.0	184
240 min Summer	21.725	0.0	244
360 min Summer	16.191	0.0	362
480 min Summer	13.143	0.0	482
600 min Summer	11.180	0.0	602
720 min Summer	9.796	0.0	722
960 min Summer	7.627	0.0	962
1440 min Summer	5.360	0.0	1440
2160 min Summer	3.767	0.0	2052
2880 min Summer	2.933	0.0	2332
4320 min Summer	2.197	0.0	3112
5760 min Summer	1.790	0.0	3928
7200 min Summer	1.527	0.0	4760
8640 min Summer	1.341	0.0	5616
10080 min Summer	1.202	0.0	6448
15 min Winter	162.161	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	0.134	0.134	0.0	5.7	O K
60 min Winter	0.161	0.161	0.0	6.9	O K
120 min Winter	0.193	0.193	0.0	8.2	O K
180 min Winter	0.214	0.214	0.0	9.1	O K
240 min Winter	0.229	0.229	0.0	9.8	O K
360 min Winter	0.252	0.252	0.0	10.8	O K
480 min Winter	0.269	0.269	0.0	11.5	O K
600 min Winter	0.282	0.282	0.0	12.1	O K
720 min Winter	0.293	0.293	0.0	12.5	O K
960 min Winter	0.295	0.295	0.0	12.6	O K
1440 min Winter	0.293	0.293	0.0	12.5	O K
2160 min Winter	0.283	0.283	0.0	12.1	O K
2880 min Winter	0.268	0.268	0.0	11.5	O K
4320 min Winter	0.265	0.265	0.0	11.3	O K
5760 min Winter	0.257	0.257	0.0	11.0	O K
7200 min Winter	0.247	0.247	0.0	10.6	O K
8640 min Winter	0.235	0.235	0.0	10.0	O K
10080 min Winter	0.223	0.223	0.0	9.5	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
30 min Winter	98.106	0.0	34
60 min Winter	59.354	0.0	64
120 min Winter	35.909	0.0	122
180 min Winter	26.763	0.0	182
240 min Winter	21.725	0.0	240
360 min Winter	16.191	0.0	358
480 min Winter	13.143	0.0	476
600 min Winter	11.180	0.0	594
720 min Winter	9.796	0.0	712
960 min Winter	7.627	0.0	944
1440 min Winter	5.360	0.0	1400
2160 min Winter	3.767	0.0	2072
2880 min Winter	2.933	0.0	2680
4320 min Winter	2.197	0.0	3368
5760 min Winter	1.790	0.0	4272
7200 min Winter	1.527	0.0	5192
8640 min Winter	1.341	0.0	6136
10080 min Winter	1.202	0.0	6960

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Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	1999
Site Location	GB 498650 101750 SU 98650 01750
C (1km)	-0.025
D1 (1km)	0.390
D2 (1km)	0.245
D3 (1km)	0.403
E (1km)	0.310
F (1km)	2.321
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) 0.014

Time (mins) From:	To:	Area (ha)
0	4	0.014

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Model Details

Storage is Online Cover Level (m) 1.000

Cellular Storage Structure

Invert Level (m) 0.000 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00612 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	45.0	45.0	0.401	0.0	56.2
0.400	45.0	56.2			

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Summary of Results for 10 year Return Period (+40%)

Half Drain Time : 1453 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	0.044	0.044	0.0	1.3	O K
30 min Summer	0.055	0.055	0.0	1.7	O K
60 min Summer	0.069	0.069	0.0	2.1	O K
120 min Summer	0.085	0.085	0.0	2.6	O K
180 min Summer	0.096	0.096	0.0	2.9	O K
240 min Summer	0.104	0.104	0.0	3.2	O K
360 min Summer	0.116	0.116	0.0	3.5	O K
480 min Summer	0.124	0.124	0.0	3.8	O K
600 min Summer	0.130	0.130	0.0	4.0	O K
720 min Summer	0.135	0.135	0.0	4.1	O K
960 min Summer	0.135	0.135	0.0	4.1	O K
1440 min Summer	0.132	0.132	0.0	4.0	O K
2160 min Summer	0.128	0.128	0.0	3.9	O K
2880 min Summer	0.123	0.123	0.0	3.7	O K
4320 min Summer	0.122	0.122	0.0	3.7	O K
5760 min Summer	0.118	0.118	0.0	3.6	O K
7200 min Summer	0.114	0.114	0.0	3.5	O K
8640 min Summer	0.109	0.109	0.0	3.3	O K
10080 min Summer	0.103	0.103	0.0	3.1	O K
15 min Winter	0.049	0.049	0.0	1.5	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	72.148	0.0	19
30 min Summer	45.463	0.0	34
60 min Summer	28.648	0.0	64
120 min Summer	18.052	0.0	124
180 min Summer	13.779	0.0	182
240 min Summer	11.375	0.0	242
360 min Summer	8.683	0.0	362
480 min Summer	7.168	0.0	482
600 min Summer	6.178	0.0	602
720 min Summer	5.471	0.0	722
960 min Summer	4.332	0.0	960
1440 min Summer	3.118	0.0	1210
2160 min Summer	2.244	0.0	1560
2880 min Summer	1.777	0.0	1964
4320 min Summer	1.363	0.0	2808
5760 min Summer	1.130	0.0	3632
7200 min Summer	0.977	0.0	4464
8640 min Summer	0.867	0.0	5264
10080 min Summer	0.784	0.0	6048
15 min Winter	72.148	0.0	19

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Summary of Results for 10 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	0.062	0.062	0.0	1.9	O K
60 min Winter	0.077	0.077	0.0	2.3	O K
120 min Winter	0.096	0.096	0.0	2.9	O K
180 min Winter	0.108	0.108	0.0	3.3	O K
240 min Winter	0.117	0.117	0.0	3.6	O K
360 min Winter	0.131	0.131	0.0	4.0	O K
480 min Winter	0.140	0.140	0.0	4.3	O K
600 min Winter	0.148	0.148	0.0	4.5	O K
720 min Winter	0.154	0.154	0.0	4.7	O K
960 min Winter	0.155	0.155	0.0	4.7	O K
1440 min Winter	0.152	0.152	0.0	4.6	O K
2160 min Winter	0.145	0.145	0.0	4.4	O K
2880 min Winter	0.138	0.138	0.0	4.2	O K
4320 min Winter	0.134	0.134	0.0	4.1	O K
5760 min Winter	0.127	0.127	0.0	3.8	O K
7200 min Winter	0.118	0.118	0.0	3.6	O K
8640 min Winter	0.108	0.108	0.0	3.3	O K
10080 min Winter	0.099	0.099	0.0	3.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
30 min Winter	45.463	0.0	33
60 min Winter	28.648	0.0	62
120 min Winter	18.052	0.0	122
180 min Winter	13.779	0.0	180
240 min Winter	11.375	0.0	240
360 min Winter	8.683	0.0	356
480 min Winter	7.168	0.0	472
600 min Winter	6.178	0.0	588
720 min Winter	5.471	0.0	702
960 min Winter	4.332	0.0	930
1440 min Winter	3.118	0.0	1356
2160 min Winter	2.244	0.0	1688
2880 min Winter	1.777	0.0	2136
4320 min Winter	1.363	0.0	3068
5760 min Winter	1.130	0.0	3928
7200 min Winter	0.977	0.0	4824
8640 min Winter	0.867	0.0	5616
10080 min Winter	0.784	0.0	6360

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Rainfall Details

Rainfall Model	FEH
Return Period (years)	10
FEH Rainfall Version	1999
Site Location	GB 498650 101750 SU 98650 01750
C (1km)	-0.025
D1 (1km)	0.390
D2 (1km)	0.245
D3 (1km)	0.403
E (1km)	0.310
F (1km)	2.321
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) 0.010

Time (mins) From:	To:	Area (ha)
0	4	0.010

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Model Details

Storage is Online Cover Level (m) 1.000

Cellular Storage Structure

Invert Level (m) 0.000 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00612 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	32.0	32.0	0.401	0.0	41.6
0.400	32.0	41.6			

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

Half Drain Time : 2763 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	0.099	0.099	0.0	3.0	O K
30 min Summer	0.120	0.120	0.0	3.6	O K
60 min Summer	0.144	0.144	0.0	4.4	O K
120 min Summer	0.172	0.172	0.0	5.2	O K
180 min Summer	0.191	0.191	0.0	5.8	O K
240 min Summer	0.205	0.205	0.0	6.2	O K
360 min Summer	0.225	0.225	0.0	6.8	O K
480 min Summer	0.240	0.240	0.0	7.3	O K
600 min Summer	0.251	0.251	0.0	7.6	O K
720 min Summer	0.260	0.260	0.0	7.9	O K
960 min Summer	0.261	0.261	0.0	7.9	O K
1440 min Summer	0.257	0.257	0.0	7.8	O K
2160 min Summer	0.245	0.245	0.0	7.4	O K
2880 min Summer	0.233	0.233	0.0	7.1	O K
4320 min Summer	0.232	0.232	0.0	7.0	O K
5760 min Summer	0.227	0.227	0.0	6.9	O K
7200 min Summer	0.221	0.221	0.0	6.7	O K
8640 min Summer	0.214	0.214	0.0	6.5	O K
10080 min Summer	0.207	0.207	0.0	6.3	O K
15 min Winter	0.111	0.111	0.0	3.4	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	162.161	0.0	19
30 min Summer	98.106	0.0	34
60 min Summer	59.354	0.0	64
120 min Summer	35.909	0.0	124
180 min Summer	26.763	0.0	184
240 min Summer	21.725	0.0	244
360 min Summer	16.191	0.0	362
480 min Summer	13.143	0.0	482
600 min Summer	11.180	0.0	602
720 min Summer	9.796	0.0	722
960 min Summer	7.627	0.0	962
1440 min Summer	5.360	0.0	1440
2160 min Summer	3.767	0.0	2052
2880 min Summer	2.933	0.0	2336
4320 min Summer	2.197	0.0	3112
5760 min Summer	1.790	0.0	3928
7200 min Summer	1.527	0.0	4760
8640 min Summer	1.341	0.0	5616
10080 min Summer	1.202	0.0	6448
15 min Winter	162.161	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	0.134	0.134	0.0	4.1	O K
60 min Winter	0.162	0.162	0.0	4.9	O K
120 min Winter	0.194	0.194	0.0	5.9	O K
180 min Winter	0.215	0.215	0.0	6.5	O K
240 min Winter	0.230	0.230	0.0	7.0	O K
360 min Winter	0.253	0.253	0.0	7.7	O K
480 min Winter	0.270	0.270	0.0	8.2	O K
600 min Winter	0.284	0.284	0.0	8.6	O K
720 min Winter	0.294	0.294	0.0	8.9	O K
960 min Winter	0.296	0.296	0.0	9.0	O K
1440 min Winter	0.294	0.294	0.0	9.0	O K
2160 min Winter	0.284	0.284	0.0	8.6	O K
2880 min Winter	0.270	0.270	0.0	8.2	O K
4320 min Winter	0.266	0.266	0.0	8.1	O K
5760 min Winter	0.259	0.259	0.0	7.9	O K
7200 min Winter	0.249	0.249	0.0	7.6	O K
8640 min Winter	0.237	0.237	0.0	7.2	O K
10080 min Winter	0.224	0.224	0.0	6.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
30 min Winter	98.106	0.0	34
60 min Winter	59.354	0.0	64
120 min Winter	35.909	0.0	122
180 min Winter	26.763	0.0	182
240 min Winter	21.725	0.0	240
360 min Winter	16.191	0.0	358
480 min Winter	13.143	0.0	476
600 min Winter	11.180	0.0	596
720 min Winter	9.796	0.0	712
960 min Winter	7.627	0.0	944
1440 min Winter	5.360	0.0	1400
2160 min Winter	3.767	0.0	2072
2880 min Winter	2.933	0.0	2684
4320 min Winter	2.197	0.0	3368
5760 min Winter	1.790	0.0	4272
7200 min Winter	1.527	0.0	5192
8640 min Winter	1.341	0.0	6136
10080 min Winter	1.202	0.0	6960

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Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	1999
Site Location	GB 498650 101750 SU 98650 01750
C (1km)	-0.025
D1 (1km)	0.390
D2 (1km)	0.245
D3 (1km)	0.403
E (1km)	0.310
F (1km)	2.321
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) 0.010

Time (mins) From:	To:	Area (ha)
0	4	0.010

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Model Details

Storage is Online Cover Level (m) 1.000

Cellular Storage Structure

Invert Level (m) 0.000 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00612 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	32.0	32.0	0.401	0.0	41.6
0.400	32.0	41.6			

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Summary of Results for 10 year Return Period (+40%)

Half Drain Time : 1445 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	0.044	0.044	0.0	1.9	O K
30 min Summer	0.055	0.055	0.0	2.3	O K
60 min Summer	0.068	0.068	0.0	2.9	O K
120 min Summer	0.085	0.085	0.0	3.6	O K
180 min Summer	0.095	0.095	0.0	4.1	O K
240 min Summer	0.103	0.103	0.0	4.4	O K
360 min Summer	0.115	0.115	0.0	4.9	O K
480 min Summer	0.123	0.123	0.0	5.3	O K
600 min Summer	0.130	0.130	0.0	5.5	O K
720 min Summer	0.134	0.134	0.0	5.7	O K
960 min Summer	0.134	0.134	0.0	5.7	O K
1440 min Summer	0.132	0.132	0.0	5.6	O K
2160 min Summer	0.127	0.127	0.0	5.4	O K
2880 min Summer	0.122	0.122	0.0	5.2	O K
4320 min Summer	0.121	0.121	0.0	5.2	O K
5760 min Summer	0.118	0.118	0.0	5.0	O K
7200 min Summer	0.113	0.113	0.0	4.8	O K
8640 min Summer	0.108	0.108	0.0	4.6	O K
10080 min Summer	0.102	0.102	0.0	4.4	O K
15 min Winter	0.049	0.049	0.0	2.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	72.148	0.0	19
30 min Summer	45.463	0.0	34
60 min Summer	28.648	0.0	64
120 min Summer	18.052	0.0	124
180 min Summer	13.779	0.0	182
240 min Summer	11.375	0.0	242
360 min Summer	8.683	0.0	362
480 min Summer	7.168	0.0	482
600 min Summer	6.178	0.0	602
720 min Summer	5.471	0.0	722
960 min Summer	4.332	0.0	960
1440 min Summer	3.118	0.0	1200
2160 min Summer	2.244	0.0	1560
2880 min Summer	1.777	0.0	1960
4320 min Summer	1.363	0.0	2808
5760 min Summer	1.130	0.0	3632
7200 min Summer	0.977	0.0	4464
8640 min Summer	0.867	0.0	5264
10080 min Summer	0.784	0.0	6048
15 min Winter	72.148	0.0	19

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Summary of Results for 10 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	0.062	0.062	0.0	2.6	O K
60 min Winter	0.077	0.077	0.0	3.3	O K
120 min Winter	0.095	0.095	0.0	4.1	O K
180 min Winter	0.107	0.107	0.0	4.6	O K
240 min Winter	0.116	0.116	0.0	5.0	O K
360 min Winter	0.130	0.130	0.0	5.6	O K
480 min Winter	0.140	0.140	0.0	6.0	O K
600 min Winter	0.147	0.147	0.0	6.3	O K
720 min Winter	0.153	0.153	0.0	6.5	O K
960 min Winter	0.154	0.154	0.0	6.6	O K
1440 min Winter	0.151	0.151	0.0	6.5	O K
2160 min Winter	0.144	0.144	0.0	6.2	O K
2880 min Winter	0.137	0.137	0.0	5.9	O K
4320 min Winter	0.133	0.133	0.0	5.7	O K
5760 min Winter	0.126	0.126	0.0	5.4	O K
7200 min Winter	0.117	0.117	0.0	5.0	O K
8640 min Winter	0.107	0.107	0.0	4.6	O K
10080 min Winter	0.098	0.098	0.0	4.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
30 min Winter	45.463	0.0	33
60 min Winter	28.648	0.0	62
120 min Winter	18.052	0.0	122
180 min Winter	13.779	0.0	180
240 min Winter	11.375	0.0	240
360 min Winter	8.683	0.0	356
480 min Winter	7.168	0.0	472
600 min Winter	6.178	0.0	588
720 min Winter	5.471	0.0	702
960 min Winter	4.332	0.0	930
1440 min Winter	3.118	0.0	1356
2160 min Winter	2.244	0.0	1688
2880 min Winter	1.777	0.0	2136
4320 min Winter	1.363	0.0	3068
5760 min Winter	1.130	0.0	3928
7200 min Winter	0.977	0.0	4824
8640 min Winter	0.867	0.0	5616
10080 min Winter	0.784	0.0	6360

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Rainfall Details

Rainfall Model	FEH
Return Period (years)	10
FEH Rainfall Version	1999
Site Location	GB 498650 101750 SU 98650 01750
C (1km)	-0.025
D1 (1km)	0.390
D2 (1km)	0.245
D3 (1km)	0.403
E (1km)	0.310
F (1km)	2.321
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) 0.014

Time (mins) From:	To:	Area (ha)
0	4	0.014

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Model Details

Storage is Online Cover Level (m) 1.000

Cellular Storage Structure

Invert Level (m) 0.000 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00612 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	45.0	45.0	0.401	0.0	56.2
0.400	45.0	56.2			

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

Half Drain Time : 2748 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	0.099	0.099	0.0	4.2	O K
30 min Summer	0.119	0.119	0.0	5.1	O K
60 min Summer	0.143	0.143	0.0	6.1	O K
120 min Summer	0.172	0.172	0.0	7.3	O K
180 min Summer	0.190	0.190	0.0	8.1	O K
240 min Summer	0.204	0.204	0.0	8.7	O K
360 min Summer	0.224	0.224	0.0	9.6	O K
480 min Summer	0.238	0.238	0.0	10.2	O K
600 min Summer	0.250	0.250	0.0	10.7	O K
720 min Summer	0.259	0.259	0.0	11.1	O K
960 min Summer	0.259	0.259	0.0	11.1	O K
1440 min Summer	0.256	0.256	0.0	10.9	O K
2160 min Summer	0.243	0.243	0.0	10.4	O K
2880 min Summer	0.232	0.232	0.0	9.9	O K
4320 min Summer	0.231	0.231	0.0	9.9	O K
5760 min Summer	0.226	0.226	0.0	9.7	O K
7200 min Summer	0.220	0.220	0.0	9.4	O K
8640 min Summer	0.213	0.213	0.0	9.1	O K
10080 min Summer	0.205	0.205	0.0	8.8	O K
15 min Winter	0.111	0.111	0.0	4.7	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	162.161	0.0	19
30 min Summer	98.106	0.0	34
60 min Summer	59.354	0.0	64
120 min Summer	35.909	0.0	124
180 min Summer	26.763	0.0	184
240 min Summer	21.725	0.0	244
360 min Summer	16.191	0.0	362
480 min Summer	13.143	0.0	482
600 min Summer	11.180	0.0	602
720 min Summer	9.796	0.0	722
960 min Summer	7.627	0.0	962
1440 min Summer	5.360	0.0	1440
2160 min Summer	3.767	0.0	2052
2880 min Summer	2.933	0.0	2332
4320 min Summer	2.197	0.0	3112
5760 min Summer	1.790	0.0	3928
7200 min Summer	1.527	0.0	4760
8640 min Summer	1.341	0.0	5616
10080 min Summer	1.202	0.0	6448
15 min Winter	162.161	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	0.134	0.134	0.0	5.7	O K
60 min Winter	0.161	0.161	0.0	6.9	O K
120 min Winter	0.193	0.193	0.0	8.2	O K
180 min Winter	0.214	0.214	0.0	9.1	O K
240 min Winter	0.229	0.229	0.0	9.8	O K
360 min Winter	0.252	0.252	0.0	10.8	O K
480 min Winter	0.269	0.269	0.0	11.5	O K
600 min Winter	0.282	0.282	0.0	12.1	O K
720 min Winter	0.293	0.293	0.0	12.5	O K
960 min Winter	0.295	0.295	0.0	12.6	O K
1440 min Winter	0.293	0.293	0.0	12.5	O K
2160 min Winter	0.283	0.283	0.0	12.1	O K
2880 min Winter	0.268	0.268	0.0	11.5	O K
4320 min Winter	0.265	0.265	0.0	11.3	O K
5760 min Winter	0.257	0.257	0.0	11.0	O K
7200 min Winter	0.247	0.247	0.0	10.6	O K
8640 min Winter	0.235	0.235	0.0	10.0	O K
10080 min Winter	0.223	0.223	0.0	9.5	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
30 min Winter	98.106	0.0	34
60 min Winter	59.354	0.0	64
120 min Winter	35.909	0.0	122
180 min Winter	26.763	0.0	182
240 min Winter	21.725	0.0	240
360 min Winter	16.191	0.0	358
480 min Winter	13.143	0.0	476
600 min Winter	11.180	0.0	594
720 min Winter	9.796	0.0	712
960 min Winter	7.627	0.0	944
1440 min Winter	5.360	0.0	1400
2160 min Winter	3.767	0.0	2072
2880 min Winter	2.933	0.0	2680
4320 min Winter	2.197	0.0	3368
5760 min Winter	1.790	0.0	4272
7200 min Winter	1.527	0.0	5192
8640 min Winter	1.341	0.0	6136
10080 min Winter	1.202	0.0	6960

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Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	1999
Site Location	GB 498650 101750 SU 98650 01750
C (1km)	-0.025
D1 (1km)	0.390
D2 (1km)	0.245
D3 (1km)	0.403
E (1km)	0.310
F (1km)	2.321
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) 0.014

Time (mins) From:	To:	Area (ha)
0	4	0.014

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Model Details

Storage is Online Cover Level (m) 1.000

Cellular Storage Structure

Invert Level (m) 0.000 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00612 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	45.0	45.0	0.401	0.0	56.2
0.400	45.0	56.2			

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Summary of Results for 10 year Return Period (+40%)

Half Drain Time : 1513 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	0.046	0.046	0.0	1.7	O K
30 min Summer	0.057	0.057	0.0	2.2	O K
60 min Summer	0.071	0.071	0.0	2.7	O K
120 min Summer	0.088	0.088	0.0	3.4	O K
180 min Summer	0.100	0.100	0.0	3.8	O K
240 min Summer	0.108	0.108	0.0	4.1	O K
360 min Summer	0.121	0.121	0.0	4.6	O K
480 min Summer	0.129	0.129	0.0	4.9	O K
600 min Summer	0.136	0.136	0.0	5.2	O K
720 min Summer	0.141	0.141	0.0	5.4	O K
960 min Summer	0.142	0.142	0.0	5.4	O K
1440 min Summer	0.139	0.139	0.0	5.3	O K
2160 min Summer	0.134	0.134	0.0	5.1	O K
2880 min Summer	0.129	0.129	0.0	4.9	O K
4320 min Summer	0.129	0.129	0.0	4.9	O K
5760 min Summer	0.125	0.125	0.0	4.8	O K
7200 min Summer	0.121	0.121	0.0	4.6	O K
8640 min Summer	0.116	0.116	0.0	4.4	O K
10080 min Summer	0.110	0.110	0.0	4.2	O K
15 min Winter	0.051	0.051	0.0	1.9	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	72.148	0.0	19
30 min Summer	45.463	0.0	34
60 min Summer	28.648	0.0	64
120 min Summer	18.052	0.0	124
180 min Summer	13.779	0.0	182
240 min Summer	11.375	0.0	242
360 min Summer	8.683	0.0	362
480 min Summer	7.168	0.0	482
600 min Summer	6.178	0.0	602
720 min Summer	5.471	0.0	722
960 min Summer	4.332	0.0	960
1440 min Summer	3.118	0.0	1226
2160 min Summer	2.244	0.0	1596
2880 min Summer	1.777	0.0	1988
4320 min Summer	1.363	0.0	2812
5760 min Summer	1.130	0.0	3640
7200 min Summer	0.977	0.0	4472
8640 min Summer	0.867	0.0	5272
10080 min Summer	0.784	0.0	6056
15 min Winter	72.148	0.0	19

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Summary of Results for 10 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	0.064	0.064	0.0	2.4	O K
60 min Winter	0.080	0.080	0.0	3.0	O K
120 min Winter	0.100	0.100	0.0	3.8	O K
180 min Winter	0.112	0.112	0.0	4.3	O K
240 min Winter	0.122	0.122	0.0	4.6	O K
360 min Winter	0.136	0.136	0.0	5.2	O K
480 min Winter	0.147	0.147	0.0	5.6	O K
600 min Winter	0.155	0.155	0.0	5.9	O K
720 min Winter	0.161	0.161	0.0	6.1	O K
960 min Winter	0.162	0.162	0.0	6.2	O K
1440 min Winter	0.160	0.160	0.0	6.1	O K
2160 min Winter	0.153	0.153	0.0	5.8	O K
2880 min Winter	0.146	0.146	0.0	5.5	O K
4320 min Winter	0.142	0.142	0.0	5.4	O K
5760 min Winter	0.135	0.135	0.0	5.1	O K
7200 min Winter	0.126	0.126	0.0	4.8	O K
8640 min Winter	0.117	0.117	0.0	4.4	O K
10080 min Winter	0.107	0.107	0.0	4.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
30 min Winter	45.463	0.0	33
60 min Winter	28.648	0.0	62
120 min Winter	18.052	0.0	122
180 min Winter	13.779	0.0	180
240 min Winter	11.375	0.0	240
360 min Winter	8.683	0.0	356
480 min Winter	7.168	0.0	472
600 min Winter	6.178	0.0	590
720 min Winter	5.471	0.0	704
960 min Winter	4.332	0.0	932
1440 min Winter	3.118	0.0	1368
2160 min Winter	2.244	0.0	1708
2880 min Winter	1.777	0.0	2160
4320 min Winter	1.363	0.0	3072
5760 min Winter	1.130	0.0	3976
7200 min Winter	0.977	0.0	4832
8640 min Winter	0.867	0.0	5624
10080 min Winter	0.784	0.0	6456

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Rainfall Details

Rainfall Model	FEH
Return Period (years)	10
FEH Rainfall Version	1999
Site Location	GB 498650 101750 SU 98650 01750
C (1km)	-0.025
D1 (1km)	0.390
D2 (1km)	0.245
D3 (1km)	0.403
E (1km)	0.310
F (1km)	2.321
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) 0.013

Time (mins) From:	To:	Area (ha)
0	4	0.013

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Model Details

Storage is Online Cover Level (m) 1.000

Cellular Storage Structure

Invert Level (m) 0.000 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00612 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	0.401	0.0	51.2
0.400	40.0	51.2			

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

Half Drain Time : 2892 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	0.103	0.103	0.0	3.9	O K
30 min Summer	0.125	0.125	0.0	4.7	O K
60 min Summer	0.150	0.150	0.0	5.7	O K
120 min Summer	0.180	0.180	0.0	6.8	O K
180 min Summer	0.199	0.199	0.0	7.6	O K
240 min Summer	0.213	0.213	0.0	8.1	O K
360 min Summer	0.234	0.234	0.0	8.9	O K
480 min Summer	0.250	0.250	0.0	9.5	O K
600 min Summer	0.262	0.262	0.0	9.9	O K
720 min Summer	0.271	0.271	0.0	10.3	O K
960 min Summer	0.272	0.272	0.0	10.4	O K
1440 min Summer	0.269	0.269	0.0	10.2	O K
2160 min Summer	0.257	0.257	0.0	9.8	O K
2880 min Summer	0.245	0.245	0.0	9.3	O K
4320 min Summer	0.244	0.244	0.0	9.3	O K
5760 min Summer	0.240	0.240	0.0	9.1	O K
7200 min Summer	0.234	0.234	0.0	8.9	O K
8640 min Summer	0.227	0.227	0.0	8.6	O K
10080 min Summer	0.220	0.220	0.0	8.4	O K
15 min Winter	0.116	0.116	0.0	4.4	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	162.161	0.0	19
30 min Summer	98.106	0.0	34
60 min Summer	59.354	0.0	64
120 min Summer	35.909	0.0	124
180 min Summer	26.763	0.0	184
240 min Summer	21.725	0.0	244
360 min Summer	16.191	0.0	364
480 min Summer	13.143	0.0	482
600 min Summer	11.180	0.0	602
720 min Summer	9.796	0.0	722
960 min Summer	7.627	0.0	962
1440 min Summer	5.360	0.0	1442
2160 min Summer	3.767	0.0	2100
2880 min Summer	2.933	0.0	2388
4320 min Summer	2.197	0.0	3156
5760 min Summer	1.790	0.0	3976
7200 min Summer	1.527	0.0	4824
8640 min Summer	1.341	0.0	5624
10080 min Summer	1.202	0.0	6456
15 min Winter	162.161	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	0.140	0.140	0.0	5.3	O K
60 min Winter	0.168	0.168	0.0	6.4	O K
120 min Winter	0.201	0.201	0.0	7.7	O K
180 min Winter	0.223	0.223	0.0	8.5	O K
240 min Winter	0.240	0.240	0.0	9.1	O K
360 min Winter	0.264	0.264	0.0	10.0	O K
480 min Winter	0.282	0.282	0.0	10.7	O K
600 min Winter	0.296	0.296	0.0	11.2	O K
720 min Winter	0.307	0.307	0.0	11.7	O K
960 min Winter	0.310	0.310	0.0	11.8	O K
1440 min Winter	0.308	0.308	0.0	11.7	O K
2160 min Winter	0.298	0.298	0.0	11.3	O K
2880 min Winter	0.284	0.284	0.0	10.8	O K
4320 min Winter	0.281	0.281	0.0	10.7	O K
5760 min Winter	0.274	0.274	0.0	10.4	O K
7200 min Winter	0.264	0.264	0.0	10.0	O K
8640 min Winter	0.253	0.253	0.0	9.6	O K
10080 min Winter	0.240	0.240	0.0	9.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
30 min Winter	98.106	0.0	34
60 min Winter	59.354	0.0	64
120 min Winter	35.909	0.0	122
180 min Winter	26.763	0.0	182
240 min Winter	21.725	0.0	240
360 min Winter	16.191	0.0	358
480 min Winter	13.143	0.0	478
600 min Winter	11.180	0.0	596
720 min Winter	9.796	0.0	712
960 min Winter	7.627	0.0	944
1440 min Winter	5.360	0.0	1402
2160 min Winter	3.767	0.0	2076
2880 min Winter	2.933	0.0	2708
4320 min Winter	2.197	0.0	3376
5760 min Winter	1.790	0.0	4328
7200 min Winter	1.527	0.0	5256
8640 min Winter	1.341	0.0	6144
10080 min Winter	1.202	0.0	7056

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Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	1999
Site Location	GB 498650 101750 SU 98650 01750
C (1km)	-0.025
D1 (1km)	0.390
D2 (1km)	0.245
D3 (1km)	0.403
E (1km)	0.310
F (1km)	2.321
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) 0.013

Time (mins) From:	To:	Area (ha)
0	4	0.013

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Model Details

Storage is Online Cover Level (m) 1.000

Cellular Storage Structure

Invert Level (m) 0.000 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00612 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	0.401	0.0	51.2
0.400	40.0	51.2			

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Summary of Results for 10 year Return Period (+40%)

Half Drain Time : 1488 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	0.045	0.045	0.0	1.9	O K
30 min Summer	0.056	0.056	0.0	2.3	O K
60 min Summer	0.070	0.070	0.0	2.9	O K
120 min Summer	0.087	0.087	0.0	3.6	O K
180 min Summer	0.098	0.098	0.0	4.1	O K
240 min Summer	0.106	0.106	0.0	4.4	O K
360 min Summer	0.118	0.118	0.0	4.9	O K
480 min Summer	0.126	0.126	0.0	5.3	O K
600 min Summer	0.133	0.133	0.0	5.6	O K
720 min Summer	0.138	0.138	0.0	5.8	O K
960 min Summer	0.138	0.138	0.0	5.8	O K
1440 min Summer	0.135	0.135	0.0	5.7	O K
2160 min Summer	0.131	0.131	0.0	5.5	O K
2880 min Summer	0.125	0.125	0.0	5.2	O K
4320 min Summer	0.125	0.125	0.0	5.2	O K
5760 min Summer	0.122	0.122	0.0	5.1	O K
7200 min Summer	0.117	0.117	0.0	4.9	O K
8640 min Summer	0.112	0.112	0.0	4.7	O K
10080 min Summer	0.106	0.106	0.0	4.4	O K
15 min Winter	0.050	0.050	0.0	2.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	72.148	0.0	19
30 min Summer	45.463	0.0	34
60 min Summer	28.648	0.0	64
120 min Summer	18.052	0.0	124
180 min Summer	13.779	0.0	182
240 min Summer	11.375	0.0	242
360 min Summer	8.683	0.0	362
480 min Summer	7.168	0.0	482
600 min Summer	6.178	0.0	602
720 min Summer	5.471	0.0	722
960 min Summer	4.332	0.0	960
1440 min Summer	3.118	0.0	1214
2160 min Summer	2.244	0.0	1580
2880 min Summer	1.777	0.0	1964
4320 min Summer	1.363	0.0	2812
5760 min Summer	1.130	0.0	3640
7200 min Summer	0.977	0.0	4464
8640 min Summer	0.867	0.0	5272
10080 min Summer	0.784	0.0	6048
15 min Winter	72.148	0.0	19

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Summary of Results for 10 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	0.063	0.063	0.0	2.6	O K
60 min Winter	0.079	0.079	0.0	3.3	O K
120 min Winter	0.097	0.097	0.0	4.1	O K
180 min Winter	0.110	0.110	0.0	4.6	O K
240 min Winter	0.119	0.119	0.0	5.0	O K
360 min Winter	0.133	0.133	0.0	5.6	O K
480 min Winter	0.143	0.143	0.0	6.0	O K
600 min Winter	0.151	0.151	0.0	6.3	O K
720 min Winter	0.157	0.157	0.0	6.6	O K
960 min Winter	0.158	0.158	0.0	6.6	O K
1440 min Winter	0.156	0.156	0.0	6.5	O K
2160 min Winter	0.149	0.149	0.0	6.2	O K
2880 min Winter	0.141	0.141	0.0	5.9	O K
4320 min Winter	0.138	0.138	0.0	5.8	O K
5760 min Winter	0.130	0.130	0.0	5.5	O K
7200 min Winter	0.122	0.122	0.0	5.1	O K
8640 min Winter	0.112	0.112	0.0	4.7	O K
10080 min Winter	0.103	0.103	0.0	4.3	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
30 min Winter	45.463	0.0	33
60 min Winter	28.648	0.0	62
120 min Winter	18.052	0.0	122
180 min Winter	13.779	0.0	180
240 min Winter	11.375	0.0	240
360 min Winter	8.683	0.0	356
480 min Winter	7.168	0.0	472
600 min Winter	6.178	0.0	590
720 min Winter	5.471	0.0	704
960 min Winter	4.332	0.0	932
1440 min Winter	3.118	0.0	1358
2160 min Winter	2.244	0.0	1692
2880 min Winter	1.777	0.0	2160
4320 min Winter	1.363	0.0	3072
5760 min Winter	1.130	0.0	3976
7200 min Winter	0.977	0.0	4824
8640 min Winter	0.867	0.0	5624
10080 min Winter	0.784	0.0	6448

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Rainfall Details

Rainfall Model	FEH
Return Period (years)	10
FEH Rainfall Version	1999
Site Location	GB 498650 101750 SU 98650 01750
C (1km)	-0.025
D1 (1km)	0.390
D2 (1km)	0.245
D3 (1km)	0.403
E (1km)	0.310
F (1km)	2.321
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) 0.014

Time (mins) From:	To:	Area (ha)
0	4	0.014

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Model Details

Storage is Online Cover Level (m) 1.000

Cellular Storage Structure

Invert Level (m) 0.000 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00612 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	44.0	44.0	0.401	0.0	56.0
0.400	44.0	56.0			

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

Half Drain Time : 2821 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	0.101	0.101	0.0	4.2	O K
30 min Summer	0.122	0.122	0.0	5.1	O K
60 min Summer	0.147	0.147	0.0	6.1	O K
120 min Summer	0.176	0.176	0.0	7.3	O K
180 min Summer	0.194	0.194	0.0	8.1	O K
240 min Summer	0.209	0.209	0.0	8.7	O K
360 min Summer	0.229	0.229	0.0	9.6	O K
480 min Summer	0.244	0.244	0.0	10.2	O K
600 min Summer	0.256	0.256	0.0	10.7	O K
720 min Summer	0.265	0.265	0.0	11.1	O K
960 min Summer	0.266	0.266	0.0	11.1	O K
1440 min Summer	0.263	0.263	0.0	11.0	O K
2160 min Summer	0.250	0.250	0.0	10.5	O K
2880 min Summer	0.238	0.238	0.0	10.0	O K
4320 min Summer	0.237	0.237	0.0	9.9	O K
5760 min Summer	0.233	0.233	0.0	9.7	O K
7200 min Summer	0.227	0.227	0.0	9.5	O K
8640 min Summer	0.220	0.220	0.0	9.2	O K
10080 min Summer	0.213	0.213	0.0	8.9	O K
15 min Winter	0.113	0.113	0.0	4.7	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	162.161	0.0	19
30 min Summer	98.106	0.0	34
60 min Summer	59.354	0.0	64
120 min Summer	35.909	0.0	124
180 min Summer	26.763	0.0	184
240 min Summer	21.725	0.0	244
360 min Summer	16.191	0.0	364
480 min Summer	13.143	0.0	482
600 min Summer	11.180	0.0	602
720 min Summer	9.796	0.0	722
960 min Summer	7.627	0.0	962
1440 min Summer	5.360	0.0	1442
2160 min Summer	3.767	0.0	2056
2880 min Summer	2.933	0.0	2360
4320 min Summer	2.197	0.0	3116
5760 min Summer	1.790	0.0	3968
7200 min Summer	1.527	0.0	4824
8640 min Summer	1.341	0.0	5616
10080 min Summer	1.202	0.0	6456
15 min Winter	162.161	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	0.137	0.137	0.0	5.7	O K
60 min Winter	0.165	0.165	0.0	6.9	O K
120 min Winter	0.197	0.197	0.0	8.2	O K
180 min Winter	0.219	0.219	0.0	9.1	O K
240 min Winter	0.235	0.235	0.0	9.8	O K
360 min Winter	0.258	0.258	0.0	10.8	O K
480 min Winter	0.276	0.276	0.0	11.5	O K
600 min Winter	0.289	0.289	0.0	12.1	O K
720 min Winter	0.300	0.300	0.0	12.5	O K
960 min Winter	0.302	0.302	0.0	12.6	O K
1440 min Winter	0.301	0.301	0.0	12.6	O K
2160 min Winter	0.291	0.291	0.0	12.1	O K
2880 min Winter	0.277	0.277	0.0	11.6	O K
4320 min Winter	0.273	0.273	0.0	11.4	O K
5760 min Winter	0.266	0.266	0.0	11.1	O K
7200 min Winter	0.256	0.256	0.0	10.7	O K
8640 min Winter	0.244	0.244	0.0	10.2	O K
10080 min Winter	0.231	0.231	0.0	9.7	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
30 min Winter	98.106	0.0	34
60 min Winter	59.354	0.0	64
120 min Winter	35.909	0.0	122
180 min Winter	26.763	0.0	182
240 min Winter	21.725	0.0	240
360 min Winter	16.191	0.0	358
480 min Winter	13.143	0.0	476
600 min Winter	11.180	0.0	596
720 min Winter	9.796	0.0	712
960 min Winter	7.627	0.0	944
1440 min Winter	5.360	0.0	1402
2160 min Winter	3.767	0.0	2076
2880 min Winter	2.933	0.0	2704
4320 min Winter	2.197	0.0	3372
5760 min Winter	1.790	0.0	4320
7200 min Winter	1.527	0.0	5256
8640 min Winter	1.341	0.0	6136
10080 min Winter	1.202	0.0	7056

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Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	1999
Site Location	GB 498650 101750 SU 98650 01750
C (1km)	-0.025
D1 (1km)	0.390
D2 (1km)	0.245
D3 (1km)	0.403
E (1km)	0.310
F (1km)	2.321
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) 0.014

Time (mins) From:	To:	Area (ha)
0	4	0.014

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Model Details

Storage is Online Cover Level (m) 1.000

Cellular Storage Structure

Invert Level (m) 0.000 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00612 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	44.0	44.0	0.401	0.0	56.0
0.400	44.0	56.0			

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Summary of Results for 10 year Return Period (+40%)

Half Drain Time : 586 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	0.061	0.061	0.1	1.8	O K
30 min Summer	0.076	0.076	0.1	2.3	O K
60 min Summer	0.093	0.093	0.1	2.8	O K
120 min Summer	0.112	0.112	0.1	3.4	O K
180 min Summer	0.124	0.124	0.1	3.8	O K
240 min Summer	0.132	0.132	0.1	4.0	O K
360 min Summer	0.142	0.142	0.1	4.3	O K
480 min Summer	0.147	0.147	0.1	4.5	O K
600 min Summer	0.151	0.151	0.1	4.6	O K
720 min Summer	0.153	0.153	0.1	4.7	O K
960 min Summer	0.148	0.148	0.1	4.5	O K
1440 min Summer	0.137	0.137	0.1	4.2	O K
2160 min Summer	0.121	0.121	0.1	3.7	O K
2880 min Summer	0.106	0.106	0.1	3.2	O K
4320 min Summer	0.091	0.091	0.1	2.8	O K
5760 min Summer	0.078	0.078	0.1	2.4	O K
7200 min Summer	0.066	0.066	0.1	2.0	O K
8640 min Summer	0.057	0.057	0.1	1.7	O K
10080 min Summer	0.051	0.051	0.1	1.5	O K
15 min Winter	0.068	0.068	0.1	2.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	72.148	0.0	19
30 min Summer	45.463	0.0	33
60 min Summer	28.648	0.0	62
120 min Summer	18.052	0.0	122
180 min Summer	13.779	0.0	182
240 min Summer	11.375	0.0	242
360 min Summer	8.683	0.0	360
480 min Summer	7.168	0.0	438
600 min Summer	6.178	0.0	500
720 min Summer	5.471	0.0	566
960 min Summer	4.332	0.0	690
1440 min Summer	3.118	0.0	954
2160 min Summer	2.244	0.0	1364
2880 min Summer	1.777	0.0	1756
4320 min Summer	1.363	0.0	2508
5760 min Summer	1.130	0.0	3232
7200 min Summer	0.977	0.0	3960
8640 min Summer	0.867	0.0	4592
10080 min Summer	0.784	0.0	5248
15 min Winter	72.148	0.0	18

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Summary of Results for 10 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	0.085	0.085	0.1	2.6	O K
60 min Winter	0.105	0.105	0.1	3.2	O K
120 min Winter	0.127	0.127	0.1	3.9	O K
180 min Winter	0.141	0.141	0.1	4.3	O K
240 min Winter	0.150	0.150	0.1	4.6	O K
360 min Winter	0.162	0.162	0.1	4.9	O K
480 min Winter	0.169	0.169	0.1	5.2	O K
600 min Winter	0.173	0.173	0.1	5.3	O K
720 min Winter	0.176	0.176	0.1	5.3	O K
960 min Winter	0.169	0.169	0.1	5.1	O K
1440 min Winter	0.153	0.153	0.1	4.7	O K
2160 min Winter	0.129	0.129	0.1	3.9	O K
2880 min Winter	0.107	0.107	0.1	3.2	O K
4320 min Winter	0.081	0.081	0.1	2.5	O K
5760 min Winter	0.061	0.061	0.1	1.9	O K
7200 min Winter	0.049	0.049	0.1	1.5	O K
8640 min Winter	0.044	0.044	0.1	1.4	O K
10080 min Winter	0.041	0.041	0.1	1.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
30 min Winter	45.463	0.0	33
60 min Winter	28.648	0.0	62
120 min Winter	18.052	0.0	120
180 min Winter	13.779	0.0	178
240 min Winter	11.375	0.0	236
360 min Winter	8.683	0.0	350
480 min Winter	7.168	0.0	460
600 min Winter	6.178	0.0	566
720 min Winter	5.471	0.0	660
960 min Winter	4.332	0.0	742
1440 min Winter	3.118	0.0	1042
2160 min Winter	2.244	0.0	1472
2880 min Winter	1.777	0.0	1876
4320 min Winter	1.363	0.0	2636
5760 min Winter	1.130	0.0	3296
7200 min Winter	0.977	0.0	3888
8640 min Winter	0.867	0.0	4584
10080 min Winter	0.784	0.0	5336

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Rainfall Details

Rainfall Model	FEH
Return Period (years)	10
FEH Rainfall Version	1999
Site Location	GB 498650 101750 SU 98650 01750
C (1km)	-0.025
D1 (1km)	0.390
D2 (1km)	0.245
D3 (1km)	0.403
E (1km)	0.310
F (1km)	2.321
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) 0.014

Time (mins) From:	To:	Area (ha)
0	4	0.014

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Model Details

Storage is Online Cover Level (m) 1.000

Cellular Storage Structure

Invert Level (m) 0.000 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.01728 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	32.0	32.0	0.401	0.0	41.6
0.400	32.0	41.6			

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

Half Drain Time : 1208 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	0.138	0.138	0.1	4.2	O K
30 min Summer	0.166	0.166	0.1	5.0	O K
60 min Summer	0.198	0.198	0.1	6.0	O K
120 min Summer	0.234	0.234	0.1	7.1	O K
180 min Summer	0.256	0.256	0.1	7.8	O K
240 min Summer	0.271	0.271	0.1	8.2	O K
360 min Summer	0.292	0.292	0.1	8.9	O K
480 min Summer	0.305	0.305	0.1	9.3	O K
600 min Summer	0.313	0.313	0.1	9.5	O K
720 min Summer	0.318	0.318	0.1	9.7	O K
960 min Summer	0.305	0.305	0.1	9.3	O K
1440 min Summer	0.282	0.282	0.1	8.6	O K
2160 min Summer	0.254	0.254	0.1	7.7	O K
2880 min Summer	0.229	0.229	0.1	7.0	O K
4320 min Summer	0.208	0.208	0.1	6.3	O K
5760 min Summer	0.186	0.186	0.1	5.6	O K
7200 min Summer	0.164	0.164	0.1	5.0	O K
8640 min Summer	0.145	0.145	0.1	4.4	O K
10080 min Summer	0.126	0.126	0.1	3.8	O K
15 min Winter	0.155	0.155	0.1	4.7	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	162.161	0.0	19
30 min Summer	98.106	0.0	34
60 min Summer	59.354	0.0	64
120 min Summer	35.909	0.0	124
180 min Summer	26.763	0.0	182
240 min Summer	21.725	0.0	242
360 min Summer	16.191	0.0	362
480 min Summer	13.143	0.0	482
600 min Summer	11.180	0.0	602
720 min Summer	9.796	0.0	720
960 min Summer	7.627	0.0	914
1440 min Summer	5.360	0.0	1114
2160 min Summer	3.767	0.0	1492
2880 min Summer	2.933	0.0	1900
4320 min Summer	2.197	0.0	2720
5760 min Summer	1.790	0.0	3512
7200 min Summer	1.527	0.0	4256
8640 min Summer	1.341	0.0	5016
10080 min Summer	1.202	0.0	5752
15 min Winter	162.161	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	0.186	0.186	0.1	5.7	O K
60 min Winter	0.222	0.222	0.1	6.8	O K
120 min Winter	0.263	0.263	0.1	8.0	O K
180 min Winter	0.289	0.289	0.1	8.8	O K
240 min Winter	0.307	0.307	0.1	9.3	O K
360 min Winter	0.332	0.332	0.1	10.1	O K
480 min Winter	0.348	0.348	0.1	10.6	O K
600 min Winter	0.359	0.359	0.1	10.9	O K
720 min Winter	0.366	0.366	0.1	11.1	O K
960 min Winter	0.355	0.355	0.1	10.8	O K
1440 min Winter	0.326	0.326	0.1	9.9	O K
2160 min Winter	0.290	0.290	0.1	8.8	O K
2880 min Winter	0.256	0.256	0.1	7.8	O K
4320 min Winter	0.221	0.221	0.1	6.7	O K
5760 min Winter	0.184	0.184	0.1	5.6	O K
7200 min Winter	0.150	0.150	0.1	4.6	O K
8640 min Winter	0.120	0.120	0.1	3.6	O K
10080 min Winter	0.093	0.093	0.1	2.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
30 min Winter	98.106	0.0	33
60 min Winter	59.354	0.0	62
120 min Winter	35.909	0.0	122
180 min Winter	26.763	0.0	180
240 min Winter	21.725	0.0	238
360 min Winter	16.191	0.0	356
480 min Winter	13.143	0.0	472
600 min Winter	11.180	0.0	586
720 min Winter	9.796	0.0	700
960 min Winter	7.627	0.0	922
1440 min Winter	5.360	0.0	1300
2160 min Winter	3.767	0.0	1624
2880 min Winter	2.933	0.0	2072
4320 min Winter	2.197	0.0	2940
5760 min Winter	1.790	0.0	3752
7200 min Winter	1.527	0.0	4536
8640 min Winter	1.341	0.0	5272
10080 min Winter	1.202	0.0	5944

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Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	1999
Site Location	GB 498650 101750 SU 98650 01750
C (1km)	-0.025
D1 (1km)	0.390
D2 (1km)	0.245
D3 (1km)	0.403
E (1km)	0.310
F (1km)	2.321
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) 0.014

Time (mins) From:	To:	Area (ha)
0	4	0.014

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Model Details

Storage is Online Cover Level (m) 1.000

Cellular Storage Structure

Invert Level (m) 0.000 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.01728 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	32.0	32.0	0.401	0.0	41.6
0.400	32.0	41.6			

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Summary of Results for 10 year Return Period (+40%)

Half Drain Time : 568 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	0.059	0.059	0.1	1.6	O K
30 min Summer	0.074	0.074	0.1	2.0	O K
60 min Summer	0.091	0.091	0.1	2.4	O K
120 min Summer	0.110	0.110	0.1	2.9	O K
180 min Summer	0.121	0.121	0.1	3.2	O K
240 min Summer	0.129	0.129	0.1	3.4	O K
360 min Summer	0.138	0.138	0.1	3.7	O K
480 min Summer	0.143	0.143	0.1	3.8	O K
600 min Summer	0.147	0.147	0.1	3.9	O K
720 min Summer	0.149	0.149	0.1	4.0	O K
960 min Summer	0.144	0.144	0.1	3.8	O K
1440 min Summer	0.134	0.134	0.1	3.6	O K
2160 min Summer	0.118	0.118	0.1	3.1	O K
2880 min Summer	0.103	0.103	0.1	2.7	O K
4320 min Summer	0.088	0.088	0.1	2.3	O K
5760 min Summer	0.075	0.075	0.1	2.0	O K
7200 min Summer	0.064	0.064	0.1	1.7	O K
8640 min Summer	0.055	0.055	0.1	1.5	O K
10080 min Summer	0.050	0.050	0.1	1.3	O K
15 min Winter	0.067	0.067	0.1	1.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	72.148	0.0	19
30 min Summer	45.463	0.0	33
60 min Summer	28.648	0.0	62
120 min Summer	18.052	0.0	122
180 min Summer	13.779	0.0	182
240 min Summer	11.375	0.0	242
360 min Summer	8.683	0.0	360
480 min Summer	7.168	0.0	430
600 min Summer	6.178	0.0	494
720 min Summer	5.471	0.0	558
960 min Summer	4.332	0.0	684
1440 min Summer	3.118	0.0	954
2160 min Summer	2.244	0.0	1360
2880 min Summer	1.777	0.0	1756
4320 min Summer	1.363	0.0	2508
5760 min Summer	1.130	0.0	3232
7200 min Summer	0.977	0.0	3896
8640 min Summer	0.867	0.0	4584
10080 min Summer	0.784	0.0	5248
15 min Winter	72.148	0.0	18

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Summary of Results for 10 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	0.083	0.083	0.1	2.2	O K
60 min Winter	0.102	0.102	0.1	2.7	O K
120 min Winter	0.124	0.124	0.1	3.3	O K
180 min Winter	0.138	0.138	0.1	3.7	O K
240 min Winter	0.147	0.147	0.1	3.9	O K
360 min Winter	0.159	0.159	0.1	4.2	O K
480 min Winter	0.165	0.165	0.1	4.4	O K
600 min Winter	0.169	0.169	0.1	4.5	O K
720 min Winter	0.171	0.171	0.1	4.5	O K
960 min Winter	0.164	0.164	0.1	4.4	O K
1440 min Winter	0.149	0.149	0.1	4.0	O K
2160 min Winter	0.125	0.125	0.1	3.3	O K
2880 min Winter	0.103	0.103	0.1	2.7	O K
4320 min Winter	0.078	0.078	0.1	2.1	O K
5760 min Winter	0.058	0.058	0.1	1.5	O K
7200 min Winter	0.048	0.048	0.1	1.3	O K
8640 min Winter	0.044	0.044	0.1	1.2	O K
10080 min Winter	0.040	0.040	0.1	1.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
30 min Winter	45.463	0.0	33
60 min Winter	28.648	0.0	62
120 min Winter	18.052	0.0	120
180 min Winter	13.779	0.0	178
240 min Winter	11.375	0.0	236
360 min Winter	8.683	0.0	348
480 min Winter	7.168	0.0	458
600 min Winter	6.178	0.0	564
720 min Winter	5.471	0.0	652
960 min Winter	4.332	0.0	740
1440 min Winter	3.118	0.0	1040
2160 min Winter	2.244	0.0	1472
2880 min Winter	1.777	0.0	1872
4320 min Winter	1.363	0.0	2636
5760 min Winter	1.130	0.0	3288
7200 min Winter	0.977	0.0	3888
8640 min Winter	0.867	0.0	4584
10080 min Winter	0.784	0.0	5344

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Rainfall Details

Rainfall Model	FEH
Return Period (years)	10
FEH Rainfall Version	1999
Site Location	GB 498650 101750 SU 98650 01750
C (1km)	-0.025
D1 (1km)	0.390
D2 (1km)	0.245
D3 (1km)	0.403
E (1km)	0.310
F (1km)	2.321
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) 0.012

Time (mins) From:	To:	Area (ha)
0	4	0.012

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Model Details

Storage is Online Cover Level (m) 1.000

Cellular Storage Structure

Invert Level (m) 0.000 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.01728 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	28.0	28.0	0.401	0.0	37.2
0.400	28.0	37.2			

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

Half Drain Time : 1194 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	0.135	0.135	0.1	3.6	O K
30 min Summer	0.162	0.162	0.1	4.3	O K
60 min Summer	0.194	0.194	0.1	5.2	O K
120 min Summer	0.229	0.229	0.1	6.1	O K
180 min Summer	0.250	0.250	0.1	6.7	O K
240 min Summer	0.265	0.265	0.1	7.1	O K
360 min Summer	0.285	0.285	0.1	7.6	O K
480 min Summer	0.297	0.297	0.1	7.9	O K
600 min Summer	0.305	0.305	0.1	8.1	O K
720 min Summer	0.310	0.310	0.1	8.2	O K
960 min Summer	0.297	0.297	0.1	7.9	O K
1440 min Summer	0.274	0.274	0.1	7.3	O K
2160 min Summer	0.247	0.247	0.1	6.6	O K
2880 min Summer	0.222	0.222	0.1	5.9	O K
4320 min Summer	0.201	0.201	0.1	5.3	O K
5760 min Summer	0.179	0.179	0.1	4.8	O K
7200 min Summer	0.158	0.158	0.1	4.2	O K
8640 min Summer	0.138	0.138	0.1	3.7	O K
10080 min Summer	0.120	0.120	0.1	3.2	O K
15 min Winter	0.152	0.152	0.1	4.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	162.161	0.0	19
30 min Summer	98.106	0.0	34
60 min Summer	59.354	0.0	64
120 min Summer	35.909	0.0	124
180 min Summer	26.763	0.0	182
240 min Summer	21.725	0.0	242
360 min Summer	16.191	0.0	362
480 min Summer	13.143	0.0	482
600 min Summer	11.180	0.0	600
720 min Summer	9.796	0.0	720
960 min Summer	7.627	0.0	896
1440 min Summer	5.360	0.0	1110
2160 min Summer	3.767	0.0	1488
2880 min Summer	2.933	0.0	1876
4320 min Summer	2.197	0.0	2720
5760 min Summer	1.790	0.0	3512
7200 min Summer	1.527	0.0	4256
8640 min Summer	1.341	0.0	5016
10080 min Summer	1.202	0.0	5744
15 min Winter	162.161	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	0.182	0.182	0.1	4.8	O K
60 min Winter	0.218	0.218	0.1	5.8	O K
120 min Winter	0.258	0.258	0.1	6.9	O K
180 min Winter	0.283	0.283	0.1	7.5	O K
240 min Winter	0.300	0.300	0.1	8.0	O K
360 min Winter	0.324	0.324	0.1	8.6	O K
480 min Winter	0.340	0.340	0.1	9.0	O K
600 min Winter	0.350	0.350	0.1	9.3	O K
720 min Winter	0.357	0.357	0.1	9.5	O K
960 min Winter	0.346	0.346	0.1	9.2	O K
1440 min Winter	0.317	0.317	0.1	8.4	O K
2160 min Winter	0.282	0.282	0.1	7.5	O K
2880 min Winter	0.248	0.248	0.1	6.6	O K
4320 min Winter	0.212	0.212	0.1	5.6	O K
5760 min Winter	0.176	0.176	0.1	4.7	O K
7200 min Winter	0.142	0.142	0.1	3.8	O K
8640 min Winter	0.112	0.112	0.1	3.0	O K
10080 min Winter	0.087	0.087	0.1	2.3	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
30 min Winter	98.106	0.0	33
60 min Winter	59.354	0.0	62
120 min Winter	35.909	0.0	122
180 min Winter	26.763	0.0	180
240 min Winter	21.725	0.0	238
360 min Winter	16.191	0.0	356
480 min Winter	13.143	0.0	472
600 min Winter	11.180	0.0	586
720 min Winter	9.796	0.0	700
960 min Winter	7.627	0.0	922
1440 min Winter	5.360	0.0	1198
2160 min Winter	3.767	0.0	1620
2880 min Winter	2.933	0.0	2052
4320 min Winter	2.197	0.0	2936
5760 min Winter	1.790	0.0	3744
7200 min Winter	1.527	0.0	4536
8640 min Winter	1.341	0.0	5192
10080 min Winter	1.202	0.0	5856

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Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	1999
Site Location	GB 498650 101750 SU 98650 01750
C (1km)	-0.025
D1 (1km)	0.390
D2 (1km)	0.245
D3 (1km)	0.403
E (1km)	0.310
F (1km)	2.321
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) 0.012

Time (mins) From:	To:	Area (ha)
0	4	0.012

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Model Details

Storage is Online Cover Level (m) 1.000

Cellular Storage Structure

Invert Level (m) 0.000 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.01728 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	28.0	28.0	0.401	0.0	37.2
0.400	28.0	37.2			

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Summary of Results for 10 year Return Period (+40%)

Half Drain Time : 632 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	0.064	0.064	0.1	1.7	O K
30 min Summer	0.080	0.080	0.1	2.1	O K
60 min Summer	0.099	0.099	0.1	2.6	O K
120 min Summer	0.120	0.120	0.1	3.2	O K
180 min Summer	0.133	0.133	0.1	3.5	O K
240 min Summer	0.141	0.141	0.1	3.8	O K
360 min Summer	0.152	0.152	0.1	4.0	O K
480 min Summer	0.158	0.158	0.1	4.2	O K
600 min Summer	0.162	0.162	0.1	4.3	O K
720 min Summer	0.165	0.165	0.1	4.4	O K
960 min Summer	0.160	0.160	0.1	4.3	O K
1440 min Summer	0.149	0.149	0.1	4.0	O K
2160 min Summer	0.132	0.132	0.1	3.5	O K
2880 min Summer	0.117	0.117	0.1	3.1	O K
4320 min Summer	0.101	0.101	0.1	2.7	O K
5760 min Summer	0.087	0.087	0.1	2.3	O K
7200 min Summer	0.074	0.074	0.1	2.0	O K
8640 min Summer	0.064	0.064	0.1	1.7	O K
10080 min Summer	0.056	0.056	0.1	1.5	O K
15 min Winter	0.072	0.072	0.1	1.9	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	72.148	0.0	19
30 min Summer	45.463	0.0	33
60 min Summer	28.648	0.0	62
120 min Summer	18.052	0.0	122
180 min Summer	13.779	0.0	182
240 min Summer	11.375	0.0	242
360 min Summer	8.683	0.0	360
480 min Summer	7.168	0.0	458
600 min Summer	6.178	0.0	514
720 min Summer	5.471	0.0	578
960 min Summer	4.332	0.0	702
1440 min Summer	3.118	0.0	968
2160 min Summer	2.244	0.0	1368
2880 min Summer	1.777	0.0	1760
4320 min Summer	1.363	0.0	2548
5760 min Summer	1.130	0.0	3288
7200 min Summer	0.977	0.0	3968
8640 min Summer	0.867	0.0	4672
10080 min Summer	0.784	0.0	5344
15 min Winter	72.148	0.0	18

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Summary of Results for 10 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	0.090	0.090	0.1	2.4	O K
60 min Winter	0.111	0.111	0.1	3.0	O K
120 min Winter	0.136	0.136	0.1	3.6	O K
180 min Winter	0.150	0.150	0.1	4.0	O K
240 min Winter	0.161	0.161	0.1	4.3	O K
360 min Winter	0.174	0.174	0.1	4.6	O K
480 min Winter	0.182	0.182	0.1	4.9	O K
600 min Winter	0.187	0.187	0.1	5.0	O K
720 min Winter	0.190	0.190	0.1	5.1	O K
960 min Winter	0.182	0.182	0.1	4.9	O K
1440 min Winter	0.167	0.167	0.1	4.4	O K
2160 min Winter	0.143	0.143	0.1	3.8	O K
2880 min Winter	0.119	0.119	0.1	3.2	O K
4320 min Winter	0.093	0.093	0.1	2.5	O K
5760 min Winter	0.070	0.070	0.1	1.9	O K
7200 min Winter	0.054	0.054	0.1	1.4	O K
8640 min Winter	0.047	0.047	0.1	1.3	O K
10080 min Winter	0.043	0.043	0.1	1.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
30 min Winter	45.463	0.0	33
60 min Winter	28.648	0.0	62
120 min Winter	18.052	0.0	120
180 min Winter	13.779	0.0	178
240 min Winter	11.375	0.0	236
360 min Winter	8.683	0.0	350
480 min Winter	7.168	0.0	462
600 min Winter	6.178	0.0	570
720 min Winter	5.471	0.0	672
960 min Winter	4.332	0.0	754
1440 min Winter	3.118	0.0	1054
2160 min Winter	2.244	0.0	1492
2880 min Winter	1.777	0.0	1904
4320 min Winter	1.363	0.0	2680
5760 min Winter	1.130	0.0	3400
7200 min Winter	0.977	0.0	3968
8640 min Winter	0.867	0.0	4584
10080 min Winter	0.784	0.0	5336

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Rainfall Details

Rainfall Model	FEH
Return Period (years)	10
FEH Rainfall Version	1999
Site Location	GB 498650 101750 SU 98650 01750
C (1km)	-0.025
D1 (1km)	0.390
D2 (1km)	0.245
D3 (1km)	0.403
E (1km)	0.310
F (1km)	2.321
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) 0.013

Time (mins) From:	To:	Area (ha)
0	4	0.013

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Model Details

Storage is Online Cover Level (m) 1.000

Cellular Storage Structure

Invert Level (m) 0.000 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.01728 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	28.0	28.0	0.401	0.0	37.2
0.400	28.0	37.2			

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

Half Drain Time : 1303 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	0.147	0.147	0.1	3.9	O K
30 min Summer	0.176	0.176	0.1	4.7	O K
60 min Summer	0.210	0.210	0.1	5.6	O K
120 min Summer	0.249	0.249	0.1	6.6	O K
180 min Summer	0.273	0.273	0.1	7.3	O K
240 min Summer	0.289	0.289	0.1	7.7	O K
360 min Summer	0.312	0.312	0.1	8.3	O K
480 min Summer	0.326	0.326	0.1	8.7	O K
600 min Summer	0.335	0.335	0.1	8.9	O K
720 min Summer	0.341	0.341	0.1	9.1	O K
960 min Summer	0.329	0.329	0.1	8.7	O K
1440 min Summer	0.305	0.305	0.1	8.1	O K
2160 min Summer	0.275	0.275	0.1	7.3	O K
2880 min Summer	0.250	0.250	0.1	6.6	O K
4320 min Summer	0.229	0.229	0.1	6.1	O K
5760 min Summer	0.207	0.207	0.1	5.5	O K
7200 min Summer	0.185	0.185	0.1	4.9	O K
8640 min Summer	0.164	0.164	0.1	4.4	O K
10080 min Summer	0.145	0.145	0.1	3.9	O K
15 min Winter	0.164	0.164	0.1	4.4	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	162.161	0.0	19
30 min Summer	98.106	0.0	34
60 min Summer	59.354	0.0	64
120 min Summer	35.909	0.0	124
180 min Summer	26.763	0.0	182
240 min Summer	21.725	0.0	242
360 min Summer	16.191	0.0	362
480 min Summer	13.143	0.0	482
600 min Summer	11.180	0.0	602
720 min Summer	9.796	0.0	720
960 min Summer	7.627	0.0	952
1440 min Summer	5.360	0.0	1142
2160 min Summer	3.767	0.0	1516
2880 min Summer	2.933	0.0	1908
4320 min Summer	2.197	0.0	2724
5760 min Summer	1.790	0.0	3520
7200 min Summer	1.527	0.0	4320
8640 min Summer	1.341	0.0	5096
10080 min Summer	1.202	0.0	5840
15 min Winter	162.161	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	0.198	0.198	0.1	5.3	O K
60 min Winter	0.236	0.236	0.1	6.3	O K
120 min Winter	0.280	0.280	0.1	7.5	O K
180 min Winter	0.308	0.308	0.1	8.2	O K
240 min Winter	0.327	0.327	0.1	8.7	O K
360 min Winter	0.354	0.354	0.1	9.4	O K
480 min Winter	0.372	0.372	0.1	9.9	O K
600 min Winter	0.384	0.384	0.1	10.2	O K
720 min Winter	0.393	0.393	0.1	10.5	O K
960 min Winter	0.382	0.382	0.1	10.2	O K
1440 min Winter	0.354	0.354	0.1	9.4	O K
2160 min Winter	0.316	0.316	0.1	8.4	O K
2880 min Winter	0.282	0.282	0.1	7.5	O K
4320 min Winter	0.246	0.246	0.1	6.6	O K
5760 min Winter	0.210	0.210	0.1	5.6	O K
7200 min Winter	0.175	0.175	0.1	4.6	O K
8640 min Winter	0.142	0.142	0.1	3.8	O K
10080 min Winter	0.113	0.113	0.1	3.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
30 min Winter	98.106	0.0	33
60 min Winter	59.354	0.0	62
120 min Winter	35.909	0.0	122
180 min Winter	26.763	0.0	180
240 min Winter	21.725	0.0	240
360 min Winter	16.191	0.0	356
480 min Winter	13.143	0.0	472
600 min Winter	11.180	0.0	588
720 min Winter	9.796	0.0	702
960 min Winter	7.627	0.0	924
1440 min Winter	5.360	0.0	1338
2160 min Winter	3.767	0.0	1644
2880 min Winter	2.933	0.0	2080
4320 min Winter	2.197	0.0	2980
5760 min Winter	1.790	0.0	3808
7200 min Winter	1.527	0.0	4608
8640 min Winter	1.341	0.0	5360
10080 min Winter	1.202	0.0	6048

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Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	1999
Site Location	GB 498650 101750 SU 98650 01750
C (1km)	-0.025
D1 (1km)	0.390
D2 (1km)	0.245
D3 (1km)	0.403
E (1km)	0.310
F (1km)	2.321
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) 0.013

Time (mins) From:	To:	Area (ha)
0	4	0.013

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Model Details

Storage is Online Cover Level (m) 1.000

Cellular Storage Structure

Invert Level (m) 0.000 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.01728 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	28.0	28.0	0.401	0.0	37.2
0.400	28.0	37.2			

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Summary of Results for 10 year Return Period (+40%)

Half Drain Time : 513 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	0.063	0.063	0.1	1.4	O K
30 min Summer	0.079	0.079	0.1	1.8	O K
60 min Summer	0.097	0.097	0.1	2.2	O K
120 min Summer	0.117	0.117	0.1	2.7	O K
180 min Summer	0.128	0.128	0.1	2.9	O K
240 min Summer	0.136	0.136	0.1	3.1	O K
360 min Summer	0.144	0.144	0.1	3.3	O K
480 min Summer	0.149	0.149	0.1	3.4	O K
600 min Summer	0.153	0.153	0.1	3.5	O K
720 min Summer	0.155	0.155	0.1	3.5	O K
960 min Summer	0.149	0.149	0.1	3.4	O K
1440 min Summer	0.136	0.136	0.1	3.1	O K
2160 min Summer	0.118	0.118	0.1	2.7	O K
2880 min Summer	0.102	0.102	0.1	2.3	O K
4320 min Summer	0.085	0.085	0.1	1.9	O K
5760 min Summer	0.071	0.071	0.1	1.6	O K
7200 min Summer	0.059	0.059	0.1	1.4	O K
8640 min Summer	0.051	0.051	0.1	1.2	O K
10080 min Summer	0.047	0.047	0.1	1.1	O K
15 min Winter	0.071	0.071	0.1	1.6	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	72.148	0.0	19
30 min Summer	45.463	0.0	33
60 min Summer	28.648	0.0	62
120 min Summer	18.052	0.0	122
180 min Summer	13.779	0.0	182
240 min Summer	11.375	0.0	240
360 min Summer	8.683	0.0	352
480 min Summer	7.168	0.0	412
600 min Summer	6.178	0.0	476
720 min Summer	5.471	0.0	542
960 min Summer	4.332	0.0	674
1440 min Summer	3.118	0.0	940
2160 min Summer	2.244	0.0	1340
2880 min Summer	1.777	0.0	1728
4320 min Summer	1.363	0.0	2468
5760 min Summer	1.130	0.0	3176
7200 min Summer	0.977	0.0	3888
8640 min Summer	0.867	0.0	4504
10080 min Summer	0.784	0.0	5240
15 min Winter	72.148	0.0	18

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Summary of Results for 10 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	0.089	0.089	0.1	2.0	O K
60 min Winter	0.109	0.109	0.1	2.5	O K
120 min Winter	0.132	0.132	0.1	3.0	O K
180 min Winter	0.146	0.146	0.1	3.3	O K
240 min Winter	0.155	0.155	0.1	3.5	O K
360 min Winter	0.166	0.166	0.1	3.8	O K
480 min Winter	0.172	0.172	0.1	3.9	O K
600 min Winter	0.175	0.175	0.1	4.0	O K
720 min Winter	0.177	0.177	0.1	4.0	O K
960 min Winter	0.169	0.169	0.1	3.9	O K
1440 min Winter	0.151	0.151	0.1	3.4	O K
2160 min Winter	0.124	0.124	0.1	2.8	O K
2880 min Winter	0.099	0.099	0.1	2.3	O K
4320 min Winter	0.071	0.071	0.1	1.6	O K
5760 min Winter	0.053	0.053	0.1	1.2	O K
7200 min Winter	0.046	0.046	0.1	1.0	O K
8640 min Winter	0.041	0.041	0.1	0.9	O K
10080 min Winter	0.037	0.037	0.0	0.9	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
30 min Winter	45.463	0.0	33
60 min Winter	28.648	0.0	62
120 min Winter	18.052	0.0	120
180 min Winter	13.779	0.0	178
240 min Winter	11.375	0.0	236
360 min Winter	8.683	0.0	348
480 min Winter	7.168	0.0	456
600 min Winter	6.178	0.0	556
720 min Winter	5.471	0.0	584
960 min Winter	4.332	0.0	730
1440 min Winter	3.118	0.0	1026
2160 min Winter	2.244	0.0	1452
2880 min Winter	1.777	0.0	1844
4320 min Winter	1.363	0.0	2556
5760 min Winter	1.130	0.0	3176
7200 min Winter	0.977	0.0	3824
8640 min Winter	0.867	0.0	4568
10080 min Winter	0.784	0.0	5336

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Rainfall Details

Rainfall Model	FEH
Return Period (years)	10
FEH Rainfall Version	1999
Site Location	GB 498650 101750 SU 98650 01750
C (1km)	-0.025
D1 (1km)	0.390
D2 (1km)	0.245
D3 (1km)	0.403
E (1km)	0.310
F (1km)	2.321
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) 0.011

Time (mins) From:	To:	Area (ha)
0	4	0.011

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Model Details

Storage is Online Cover Level (m) 1.000

Cellular Storage Structure

Invert Level (m) 0.000 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.01980 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	24.0	24.0	0.401	0.0	35.2
0.400	24.0	35.2			

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

Half Drain Time : 1092 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	0.144	0.144	0.1	3.3	O K
30 min Summer	0.173	0.173	0.1	4.0	O K
60 min Summer	0.207	0.207	0.1	4.7	O K
120 min Summer	0.243	0.243	0.1	5.6	O K
180 min Summer	0.266	0.266	0.1	6.1	O K
240 min Summer	0.281	0.281	0.1	6.4	O K
360 min Summer	0.301	0.301	0.1	6.9	O K
480 min Summer	0.313	0.313	0.1	7.1	O K
600 min Summer	0.320	0.320	0.1	7.3	O K
720 min Summer	0.324	0.324	0.1	7.4	O K
960 min Summer	0.309	0.309	0.1	7.0	O K
1440 min Summer	0.284	0.284	0.1	6.5	O K
2160 min Summer	0.253	0.253	0.1	5.8	O K
2880 min Summer	0.226	0.226	0.1	5.1	O K
4320 min Summer	0.201	0.201	0.1	4.6	O K
5760 min Summer	0.176	0.176	0.1	4.0	O K
7200 min Summer	0.152	0.152	0.1	3.5	O K
8640 min Summer	0.131	0.131	0.1	3.0	O K
10080 min Summer	0.112	0.112	0.1	2.6	O K
15 min Winter	0.162	0.162	0.1	3.7	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	162.161	0.0	19
30 min Summer	98.106	0.0	34
60 min Summer	59.354	0.0	64
120 min Summer	35.909	0.0	124
180 min Summer	26.763	0.0	182
240 min Summer	21.725	0.0	242
360 min Summer	16.191	0.0	362
480 min Summer	13.143	0.0	482
600 min Summer	11.180	0.0	600
720 min Summer	9.796	0.0	720
960 min Summer	7.627	0.0	856
1440 min Summer	5.360	0.0	1080
2160 min Summer	3.767	0.0	1468
2880 min Summer	2.933	0.0	1872
4320 min Summer	2.197	0.0	2680
5760 min Summer	1.790	0.0	3464
7200 min Summer	1.527	0.0	4184
8640 min Summer	1.341	0.0	4928
10080 min Summer	1.202	0.0	5648
15 min Winter	162.161	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	0.195	0.195	0.1	4.4	O K
60 min Winter	0.232	0.232	0.1	5.3	O K
120 min Winter	0.274	0.274	0.1	6.3	O K
180 min Winter	0.300	0.300	0.1	6.8	O K
240 min Winter	0.319	0.319	0.1	7.3	O K
360 min Winter	0.343	0.343	0.1	7.8	O K
480 min Winter	0.358	0.358	0.1	8.2	O K
600 min Winter	0.368	0.368	0.1	8.4	O K
720 min Winter	0.375	0.375	0.1	8.5	O K
960 min Winter	0.360	0.360	0.1	8.2	O K
1440 min Winter	0.328	0.328	0.1	7.5	O K
2160 min Winter	0.287	0.287	0.1	6.6	O K
2880 min Winter	0.249	0.249	0.1	5.7	O K
4320 min Winter	0.208	0.208	0.1	4.7	O K
5760 min Winter	0.167	0.167	0.1	3.8	O K
7200 min Winter	0.130	0.130	0.1	3.0	O K
8640 min Winter	0.099	0.099	0.1	2.2	O K
10080 min Winter	0.073	0.073	0.1	1.7	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
30 min Winter	98.106	0.0	33
60 min Winter	59.354	0.0	62
120 min Winter	35.909	0.0	122
180 min Winter	26.763	0.0	180
240 min Winter	21.725	0.0	238
360 min Winter	16.191	0.0	356
480 min Winter	13.143	0.0	470
600 min Winter	11.180	0.0	584
720 min Winter	9.796	0.0	698
960 min Winter	7.627	0.0	914
1440 min Winter	5.360	0.0	1154
2160 min Winter	3.767	0.0	1600
2880 min Winter	2.933	0.0	2044
4320 min Winter	2.197	0.0	2896
5760 min Winter	1.790	0.0	3688
7200 min Winter	1.527	0.0	4400
8640 min Winter	1.341	0.0	5104
10080 min Winter	1.202	0.0	5744

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Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	1999
Site Location	GB 498650 101750 SU 98650 01750
C (1km)	-0.025
D1 (1km)	0.390
D2 (1km)	0.245
D3 (1km)	0.403
E (1km)	0.310
F (1km)	2.321
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) 0.011

Time (mins) From:	To:	Area (ha)
0	4	0.011

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Model Details

Storage is Online Cover Level (m) 1.000

Cellular Storage Structure

Invert Level (m) 0.000 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.01980 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	24.0	24.0	0.401	0.0	35.2
0.400	24.0	35.2			

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Summary of Results for 10 year Return Period (+40%)

Half Drain Time : 733 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	6.816	0.016	0.1	3.4	O K
30 min Summer	6.820	0.020	0.1	4.2	O K
60 min Summer	6.824	0.024	0.1	5.2	O K
120 min Summer	6.829	0.029	0.1	6.4	O K
180 min Summer	6.832	0.032	0.1	7.1	O K
240 min Summer	6.835	0.035	0.1	7.6	O K
360 min Summer	6.837	0.037	0.1	8.3	O K
480 min Summer	6.839	0.039	0.1	8.6	O K
600 min Summer	6.840	0.040	0.1	8.9	O K
720 min Summer	6.841	0.041	0.1	9.2	O K
960 min Summer	6.841	0.041	0.1	9.1	O K
1440 min Summer	6.840	0.040	0.1	8.9	O K
2160 min Summer	6.838	0.038	0.1	8.6	O K
2880 min Summer	6.837	0.037	0.1	8.1	O K
4320 min Summer	6.836	0.036	0.1	7.9	O K
5760 min Summer	6.834	0.034	0.1	7.5	O K
7200 min Summer	6.833	0.033	0.1	7.2	O K
8640 min Summer	6.831	0.031	0.1	6.8	O K
10080 min Summer	6.830	0.030	0.1	6.5	O K
15 min Winter	6.818	0.018	0.1	3.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	72.148	0.0	19
30 min Summer	45.463	0.0	34
60 min Summer	28.648	0.0	64
120 min Summer	18.052	0.0	122
180 min Summer	13.779	0.0	182
240 min Summer	11.375	0.0	242
360 min Summer	8.683	0.0	360
480 min Summer	7.168	0.0	450
600 min Summer	6.178	0.0	502
720 min Summer	5.471	0.0	564
960 min Summer	4.332	0.0	686
1440 min Summer	3.118	0.0	964
2160 min Summer	2.244	0.0	1368
2880 min Summer	1.777	0.0	1784
4320 min Summer	1.363	0.0	2556
5760 min Summer	1.130	0.0	3344
7200 min Summer	0.977	0.0	4104
8640 min Summer	0.867	0.0	4848
10080 min Summer	0.784	0.0	5616
15 min Winter	72.148	0.0	19

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Summary of Results for 10 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	6.822	0.022	0.1	4.7	O K
60 min Winter	6.827	0.027	0.1	5.8	O K
120 min Winter	6.833	0.033	0.1	7.2	O K
180 min Winter	6.836	0.036	0.1	8.0	O K
240 min Winter	6.838	0.038	0.1	8.6	O K
360 min Winter	6.842	0.042	0.1	9.3	O K
480 min Winter	6.843	0.043	0.1	9.8	O K
600 min Winter	6.844	0.044	0.2	10.1	O K
720 min Winter	6.845	0.045	0.2	10.3	O K
960 min Winter	6.845	0.045	0.2	10.2	O K
1440 min Winter	6.844	0.044	0.1	9.9	O K
2160 min Winter	6.841	0.041	0.1	9.2	O K
2880 min Winter	6.838	0.038	0.1	8.6	O K
4320 min Winter	6.836	0.036	0.1	8.0	O K
5760 min Winter	6.834	0.034	0.1	7.4	O K
7200 min Winter	6.831	0.031	0.1	6.9	O K
8640 min Winter	6.830	0.030	0.1	6.4	O K
10080 min Winter	6.828	0.028	0.1	6.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
30 min Winter	45.463	0.0	33
60 min Winter	28.648	0.0	62
120 min Winter	18.052	0.0	120
180 min Winter	13.779	0.0	178
240 min Winter	11.375	0.0	236
360 min Winter	8.683	0.0	348
480 min Winter	7.168	0.0	458
600 min Winter	6.178	0.0	556
720 min Winter	5.471	0.0	578
960 min Winter	4.332	0.0	730
1440 min Winter	3.118	0.0	1026
2160 min Winter	2.244	0.0	1472
2880 min Winter	1.777	0.0	1904
4320 min Winter	1.363	0.0	2724
5760 min Winter	1.130	0.0	3512
7200 min Winter	0.977	0.0	4320
8640 min Winter	0.867	0.0	5016
10080 min Winter	0.784	0.0	5840

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Rainfall Details

Rainfall Model	FEH
Return Period (years)	10
FEH Rainfall Version	1999
Site Location	GB 498650 101750 SU 98650 01750
C (1km)	-0.025
D1 (1km)	0.390
D2 (1km)	0.245
D3 (1km)	0.403
E (1km)	0.310
F (1km)	2.321
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) 0.025

Time (mins) From:	To:	Area (ha)
0	4	0.025

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Model Details

Storage is Online Cover Level (m) 7.400

Swale Structure

Infiltration Coefficient Base (m/hr)	0.00612	Length (m)	200.0
Infiltration Coefficient Side (m/hr)	0.00000	Side Slope (1:X)	3.0
Safety Factor	2.0	Slope (1:X)	0.0
Porosity	1.00	Cap Volume Depth (m)	0.300
Invert Level (m)	6.800	Cap Infiltration Depth (m)	0.000
Base Width (m)	1.0		

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

Half Drain Time : 1043 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	6.834	0.034	0.1	7.5	O K
30 min Summer	6.840	0.040	0.1	9.1	O K
60 min Summer	6.847	0.047	0.2	10.8	O K
120 min Summer	6.855	0.055	0.2	12.8	O K
180 min Summer	6.859	0.059	0.2	14.0	O K
240 min Summer	6.862	0.062	0.2	14.8	O K
360 min Summer	6.867	0.067	0.2	16.0	O K
480 min Summer	6.869	0.069	0.2	16.7	O K
600 min Summer	6.871	0.071	0.2	17.1	O K
720 min Summer	6.872	0.072	0.2	17.4	O K
960 min Summer	6.870	0.070	0.2	17.0	O K
1440 min Summer	6.867	0.067	0.2	16.2	O K
2160 min Summer	6.863	0.063	0.2	15.1	O K
2880 min Summer	6.859	0.059	0.2	14.0	O K
4320 min Summer	6.856	0.056	0.2	13.2	O K
5760 min Summer	6.853	0.053	0.2	12.3	O K
7200 min Summer	6.850	0.050	0.2	11.5	O K
8640 min Summer	6.847	0.047	0.2	10.8	O K
10080 min Summer	6.845	0.045	0.2	10.2	O K
15 min Winter	6.838	0.038	0.1	8.4	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	162.161	0.0	19
30 min Summer	98.106	0.0	34
60 min Summer	59.354	0.0	64
120 min Summer	35.909	0.0	122
180 min Summer	26.763	0.0	182
240 min Summer	21.725	0.0	242
360 min Summer	16.191	0.0	362
480 min Summer	13.143	0.0	480
600 min Summer	11.180	0.0	600
720 min Summer	9.796	0.0	702
960 min Summer	7.627	0.0	798
1440 min Summer	5.360	0.0	1036
2160 min Summer	3.767	0.0	1428
2880 min Summer	2.933	0.0	1820
4320 min Summer	2.197	0.0	2636
5760 min Summer	1.790	0.0	3400
7200 min Summer	1.527	0.0	4112
8640 min Summer	1.341	0.0	4848
10080 min Summer	1.202	0.0	5640
15 min Winter	162.161	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	6.845	0.045	0.2	10.1	O K
60 min Winter	6.852	0.052	0.2	12.1	O K
120 min Winter	6.861	0.061	0.2	14.4	O K
180 min Winter	6.866	0.066	0.2	15.8	O K
240 min Winter	6.869	0.069	0.2	16.8	O K
360 min Winter	6.874	0.074	0.2	18.1	O K
480 min Winter	6.877	0.077	0.2	19.0	O K
600 min Winter	6.879	0.079	0.2	19.6	O K
720 min Winter	6.881	0.081	0.2	20.0	O K
960 min Winter	6.879	0.079	0.2	19.4	O K
1440 min Winter	6.875	0.075	0.2	18.3	O K
2160 min Winter	6.869	0.069	0.2	16.7	O K
2880 min Winter	6.864	0.064	0.2	15.2	O K
4320 min Winter	6.858	0.058	0.2	13.6	O K
5760 min Winter	6.853	0.053	0.2	12.2	O K
7200 min Winter	6.848	0.048	0.2	11.1	O K
8640 min Winter	6.845	0.045	0.2	10.2	O K
10080 min Winter	6.842	0.042	0.1	9.5	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
30 min Winter	98.106	0.0	33
60 min Winter	59.354	0.0	62
120 min Winter	35.909	0.0	122
180 min Winter	26.763	0.0	180
240 min Winter	21.725	0.0	238
360 min Winter	16.191	0.0	354
480 min Winter	13.143	0.0	468
600 min Winter	11.180	0.0	582
720 min Winter	9.796	0.0	694
960 min Winter	7.627	0.0	904
1440 min Winter	5.360	0.0	1112
2160 min Winter	3.767	0.0	1560
2880 min Winter	2.933	0.0	1988
4320 min Winter	2.197	0.0	2812
5760 min Winter	1.790	0.0	3576
7200 min Winter	1.527	0.0	4320
8640 min Winter	1.341	0.0	5096
10080 min Winter	1.202	0.0	5848

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Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	1999
Site Location	GB 498650 101750 SU 98650 01750
C (1km)	-0.025
D1 (1km)	0.390
D2 (1km)	0.245
D3 (1km)	0.403
E (1km)	0.310
F (1km)	2.321
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) 0.025

Time (mins) From:	To:	Area (ha)
0	4	0.025

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Model Details

Storage is Online Cover Level (m) 7.400

Swale Structure

Infiltration Coefficient Base (m/hr)	0.00612	Length (m)	200.0
Infiltration Coefficient Side (m/hr)	0.00000	Side Slope (1:X)	3.0
Safety Factor	2.0	Slope (1:X)	0.0
Porosity	1.00	Cap Volume Depth (m)	0.300
Invert Level (m)	6.800	Cap Infiltration Depth (m)	0.000
Base Width (m)	1.0		

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APPENDIX H

Arun DC Surface Water Checklist

Surface Water Drainage Proposal Checklist

This 'Surface Water Drainage Proposals Checklist' has been designed to clearly define Arun District Council's and Chichester District Council's expectations and requirements for any surface water drainage proposals, submitted for appraisal by the council's Engineers, during the planning process.

Please be aware that it is in your interest to provide all of the requested information, as this will allow the council's Engineers to quickly and efficiently review your proposals. The omission of any requested information may lead to delays in the planning process.

This document will be of help to any applicant, or drainage consultant, preparing to submit a 'Discharge of Conditions Application' relating to surface water drainage conditions. Alternatively, it can also be used earlier in the planning process, if the applicant wishes to avoid pre-commencement conditions relating to surface water drainage. The Town and Country Planning Regulations now require pre-commencement conditions to have the prior agreement of the applicant regarding their wording and use. Therefore, if you wish to avoid pre-commencement conditions, in relation to surface water drainage, you will need to submit proposals that provide the information requested in this checklist and also align with the requirements of the following documents:

West Sussex Policy for the Management of Surface Water (WSCC)
'Supplementary Requirements for Surface Water Drainage Proposals'. (Arun DC)
'Supplementary Requirements for Surface Water Drainage Proposals'. (Chichester DC)

By submitting all of the information requested by this checklist you will enable the council's Engineers to determine whether your proposals follow the hierarchy for sustainable drainage and will adequately drain the site.

Please be aware that it will be difficult for the council's Engineers to undertake a timely assessment of your application if you fail to provide any of the information requested.

Version 3.0 (20.11.2019)

Surface Water Drainage Proposal Checklist

Ground Investigation Results				
Results Required	**Results Provided?**			
Winter groundwater monitoring results (Please refer to guidance note 1 below)	**Yes**	X	**No**	
Period of winter groundwater monitoring Note 1	**From**	29/10/19		
	To	12/03/20		
Maximum recorded groundwater level	5.010 **mAOD** 2.790 **mBGL**			
Winter infiltration test results Note 2	**Yes**	X	**No**	
Date of winter infiltration testing	28/01/20			
Details of the location and depth of the infiltration testing Note 3	**Yes**	X	**No**	
Minimum infiltration rate Note 4	REFER TO REPORT **m/s**			

Guidance Notes

1. A full winters groundwater monitoring should be undertaken, (October to March inclusive) to enable the peak annual groundwater levels to be established. The extent of winter monitoring for developments of less than 5 properties should be discussed with the council's Engineers.
2. Infiltration testing should be undertaken during the wet winter months (typically January) and in line with BRE365, or a similar approved method. Tests should be repeated 3x, to replicate saturated ground conditions. Please note that infiltration testing is to be carried out at a time and depth agreed with the Councils engineers.
3. Infiltration testing should be undertaken at the location and depth of any proposed infiltration structures. This must be above the maximum recorded groundwater level in that vicinity.
4. The minimum infiltration rate obtained at the location and depth of the proposed infiltration structures should be used to inform the design of the structures.

Proposed Method of Surface Water Disposal				
Infiltration On-site, via soak-away structures	**Yes**	X	**No**	
If on-site infiltration is not to be used, has justification for this been provided? Note 5	**Yes**		**No**	
Attenuation (on-site) with a **restricted discharge to a watercourse** on, or adjacent to, the site	**Yes**		**No**	
Attenuation (on-site) with a **restricted discharge to a surface water sewer** on, or adjacent to, the site	**Yes**		**No**	
Attenuation (on-site) with a **restricted discharge to a foul water sewer** on, or adjacent to, the site	**Yes**		**No**	

Guidance Notes

5. If on-site infiltration is not being used to drain the site you will need to provide evidence that demonstrates on-site infiltration is unviable.

Drainage Design: Supporting Calculations							
Calculations Required		Calculations Provided?					
Infiltration Structures	Half-drain time for 10 year event (plus climate change allowance)	Yes	X	No			
		SEE CALCS Hours					
	Half-drain time for 100 year event (plus climate change allowance)	Yes	X	No			
		SEE CALCS Hours					
	Calculations demonstrating that the 1 in 100 year event, plus climate change allowance can be accommodated on-site. Note 7	Yes	X	No			
	Lowest base level of infiltration structure	REFER TO DRAWINGS mAOD mBGL					
	Has the design sought to provide treatment of potential contaminants? E.g. hydrocarbons.	Yes	X	No			
Attenuation and Subsequent Restricted Discharge	Pre-development run-off rate calculations	Yes		No			
		l/s					
	Proposed discharge rate Note 6	l/s					
	Calculations demonstrating that the 1 in 100 year event, plus climate change allowance can be accommodated on-site. Note 7	Yes		No			
	Has the design sought to provide treatment of potential contaminants? E.g. hydrocarbons.	Yes		No			
	If your proposed scheme incorporates any impermeable lined attenuation features we require calculations to demonstrate that appropriate resistance to floatation (due to groundwater levels) is catered for in the design	Yes		No			
	If you propose discharging into or altering an ordinary watercourse; have you sought Ordinary Watercourse/Land Drainage Consent? Note 8	Yes		No			
	If discharging to a watercourse, piped system or the sea, has the proposed drainage network been modelled against predicted top water levels for the 1 in 100 year storm event plus climate change allowance, within the existing system? Note 9	Yes		No			

Guidance Notes

6. Any proposed discharge rate must be less than, or equal to, the pre-development rate. Greenfield sites must use the mean flow rate (Qbar) and be based upon the area occupied by the development, ignoring significant open spaces. Please note that the minimum acceptable discharge rate is 2l/s when using formal flow control devices, unless otherwise agreed. Additionally, if you are developing a brownfield site, we expect you to provide fully detailed plans of the existing surface water drainage arrangements on site, including impermeable areas, gullies, outfalls, pipes & diameters, manholes, etc. We generally seek 50% betterment in terms of run off from brownfield sites.

7. The appropriate factor of safety from the table below must be applied to your calculations to ensure your design is fully in accordance with CIRIA R156/ CIRIA C753.

Factor of Safety Table						
Size of Area to be Drained	Consequences of failure					
	No damage or inconvenience		Minor inconvenience, e.g. surface water on car park		Damage to buildings or structures or roads.	
	Cv=1.0	Cv=0.75	Cv=1.0	Cv=0.75	Cv=1.0	Cv=0.75
<100 m^2	1.5	2	2	3	10	13
100m^2 to 1000m^2	1.5	2	3	4	10	13
>1000m^2	1.5	2	5	6.5	10	13

8. Ordinary Watercourse/Land Drainage Consent will need to be sought, ideally in parallel with planning permission, if you propose discharging into, culverting or altering a watercourse.
9. Modelling is required to ensure that problems, such as surcharged outfalls, are addressed.

Plans/Drawings/Diagrams				
Required	**Provided?**			
Plan detailing the location of groundwater monitoring and infiltration testing	**Yes**	X	**No**	
Detailed drainage layout plan Note 10	**Yes**	X	**No**	
Construction detail plans Note 11	**Yes**	X	**No**	
Exceedance flow route plans Note 12	**Yes**	X	**No**	
Impermeable area plan	**Yes**	X	**No**	
If ground levels are being raised ≥ 300mm above existing levels and is unavoidable, have fully detailed plans been provided, together with drainage proposals, to address any potential drainage related issues.	**Yes**	X	**No**	

Guidance Notes

10. Drainage layout plans should include:

- All surface water drainage pipes labelled with; diameters, pipe materials, falls and invert levels.
- All infiltrating and attenuating structures (including permeable paving) labelled with; dimensions, invert and cover levels.
- All manholes labelled with; cover levels, invert levels, cover types detailed.
- All silt traps clearly labelled with sump depths.
- Control structures with outflow rates and invert levels.
- Proposed/existing levels of any areas subject to ground raising, together with suitable measures/detailed drawings for the associated management of surface water runoff. Please note that ground raising should be avoided unless there are exceptional circumstances.

11. Site specific construction detail plans should be supplied if your proposed drainage scheme includes any of the following elements: pipe bed and surround; infiltrating structures; attenuating structures; manholes; catch-pits/silt traps; control devices; permeable paving; headwalls.
12. Unless specifically requested by the council's drainage engineers 'Exceedance Flow Route Plans' are only required for developments of more than 5 residential properties or more than 0.5ha of commercial development .