S631 – Land north of Coach Road, Great Horkesley
Flooding and Surface Water Management – Site Representations
For Bloor Homes
December 2025

1. This note presents the findings of a desktop investigation into flood risk and surface water management matters for land to the north of Coach Road, in Great Horkesley, Colchester. The note identifies the constraints and opportunities at the site and how flooding and surface water runoff can be managed in line with good practice and guidance.

Sources of flooding

2. The site lies in Flood Zone 1 (the low probability flood area) and is not therefore considered to be at risk of inundation from a Main River or other significantly sized watercourse (see Image 1 below).

Image 1 Flood Map for Planning extract © Crown copyright and database rights 2025 Ordnance Survey 100047325

3. Surface water flood mapping (see image 2 overleaf) shows small patches of flooding within the site. The isolated and 'patchy' nature of the spots of flooding, in the context of the site and surrounding ground levels (see Image 3), suggests that the flooding is the result of rural runoff from the site itself rather than the result of flow from farther afield. The limited flooding (much of which is in the low risk category) is not considered to pose a notable threat to the proposals and would be readily managed with suitable masterplanning at the detailed layout stage. It is also worth noting that the implementation of a formal drainage scheme for the proposals (based on sustainable drainage principles) will inherently help to reduce the pooling of currently unmanaged rural runoff. For clarity, note that the redline boundary shown on Images

2 and 3 includes the associated land to the south which is the subject of (a currently live) planning application reference 250545.

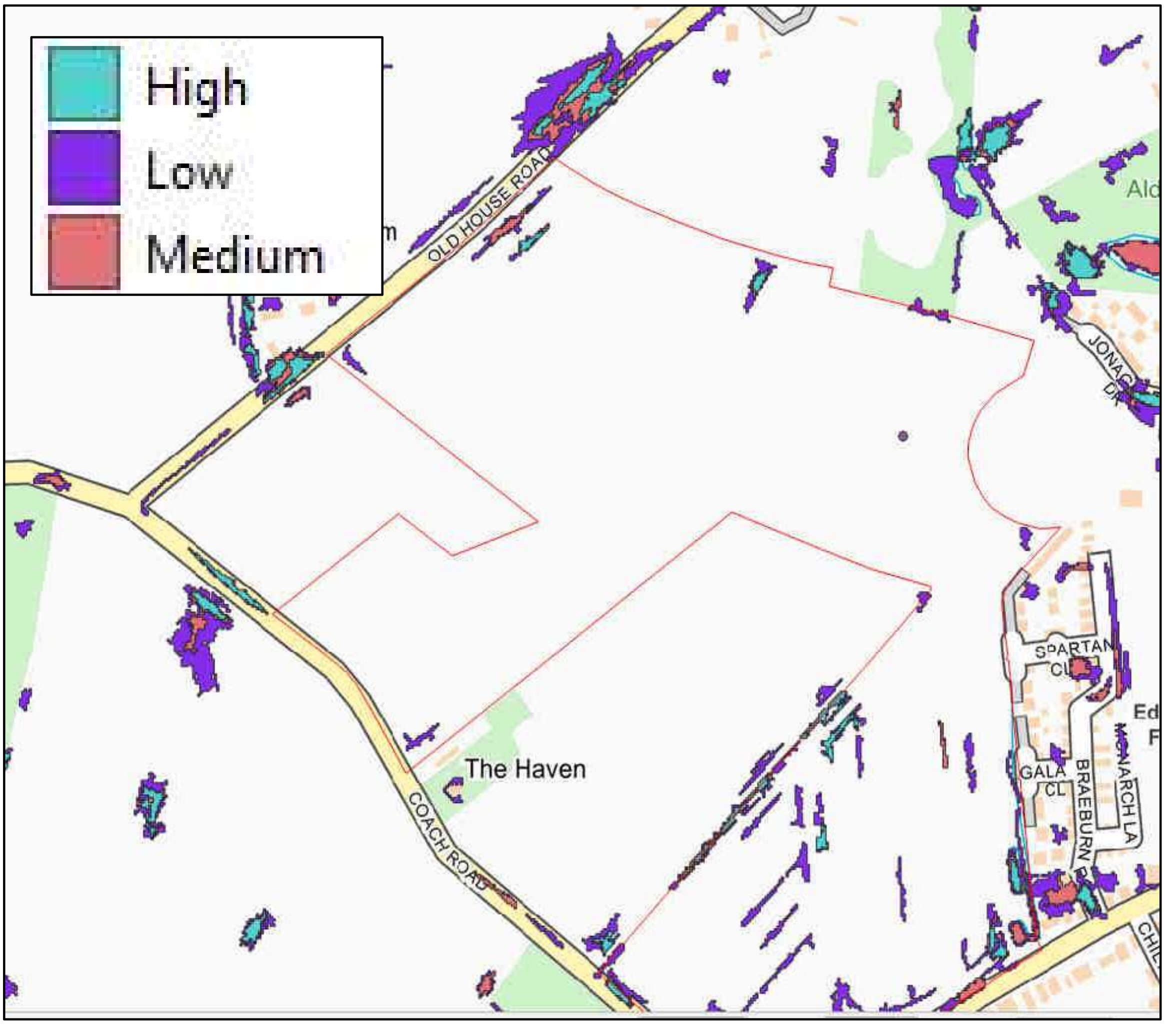


Image 2 Processed surface water flood data (with climate change)

4. The site is not identified as lying within the Colchester Critical Drainage Area (CDA) according to Essex County Council (ECC).

5. British Geological Survey mapping (appended) shows that the majority of the site is underlain by sand and gravel of the Kesgrave catchment subgroup, over clays, silts and sands of the London Clay formation. The geology is broadly considered (by the BGS report) to have a low permeability.

6. The site is not shown as being liable to flood as the result of a reservoir failure. The most notable water body in the area is the lake in Aldercar Wood (to the east). This is topographically lower than the site and would not therefore pose a flood risk to the site.

7. There are no adopted surface water, or combined sewers upslope of the site which would pose a risk to the proposals if they were to become blocked or overloaded.

8. The existing site topography is divided into three broad sub-catchments draining to the north-east, east, and south.

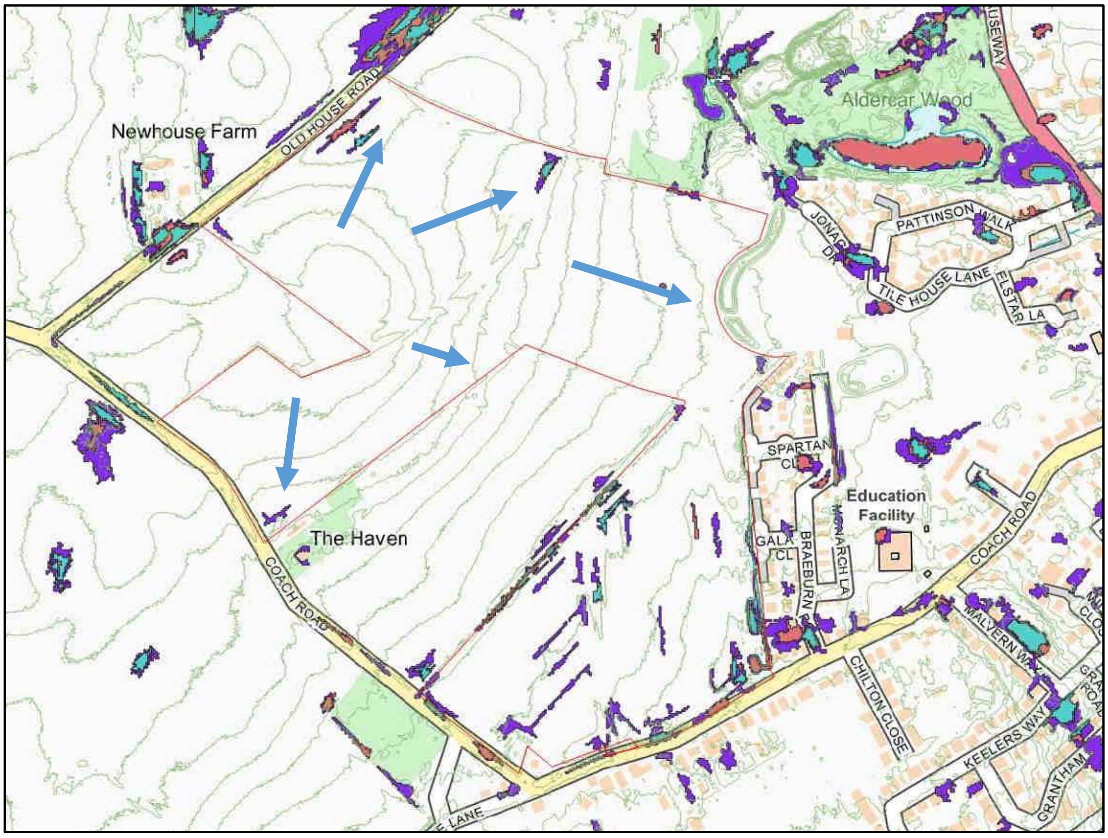


Image 3 Processed LiDAR contours © Crown copyright and database rights 2025 Ordnance Survey 100047325

Surface water management

9. From previous intrusive investigations at the application site to the south, the Kesgrave subgroup was found circa 1.5 m below ground level (beneath the topsoil and (sandy clay) subsoil. Infiltration testing suggested that a low, but useable rate was present (1 to 2 x 10^{-6} m/s) in two of the test locations. In the case of the submitted scheme, testing also suggested that groundwater levels might be too shallow to support a surface water scheme based solely on infiltration. In the case of this site, the ground levels are higher. Groundwater levels may be further from the surface in this higher land, and an infiltration drainage scheme may therefore be more suitable. Site specific infiltration tests and groundwater monitoring would be included as part of any later planning application for this site. To make sure that the opportunity to include an infiltration scheme for the site is not lost, the proposed surface

water management scheme (refer to the appended drawing) has been tested for both a positive discharge, as well as an infiltration rate of 1.0×10^{-6} m/s.

10. Both sets of surface water calculations assess the performance of the scheme against the 1 in 100 annual probability storm with creep and a climate change allowance of 45 %. The impermeable catchment areas assume that 70 % of the illustrative parcel areas become impermeable.

11. The greenfield outlet from the scheme is based on a rate of 0.9 l/s/ha. This is the annual probability rate, or Q1. Note that this is lower than the minimum rate of 3.0 l/s/ha which is supported by the current national standards for sustainable drainage systems (SuDS).

12. The inclusion of the L shaped parcel of land to west, fronting Coach Road, provides the opportunity to create a broad, shallow water management area which helps to reduce runoff rates from the bulk of the site as well as providing aesthetic and ecological value in the area. The appended calculations are based on a contributing catchment of 7.13 ha, and a discharge rate of 2.9 l/s. The contributing catchment is made up of the area of the L shaped land, or Catchment 3 on the appended plan (3.25 ha), and the impermeable catchment of Catchment 2 (the blue hatched catchment) on the appended plan (3.88 ha). The runoff coefficient of the contributing catchment in the calculations is 0.66, based on 54 % being impermeable, with a Cv of 1.0, and 46 % being permeable, with a Cv of 0.27 (calculated using BFIHOST19).

13. Redirecting the flow from the Catchment B, southwards (via the L shaped land), without increasing the Q1 rate that currently sheds southwards (to the Coach Road ditch) avoids increasing the peak flow rate running into the Coach Road ditch.

14. Local/neighbourhood SuDS components (SuDS planters, planted filter drains, tree pit gullies/green gullies) would be included alongside roads, and in blue green pockets throughout the development. The features would provide interception and treatment at the source of the runoff.

Conclusion

15. There are no sources of flooding which would impose a notable constraint to developing the site, or require unusual of novel solutions to overcome.

16. Management of surface water runoff from the proposals will follow a SuDS approach, and take advantage of opportunities to help reduce existing overland flows from the site.

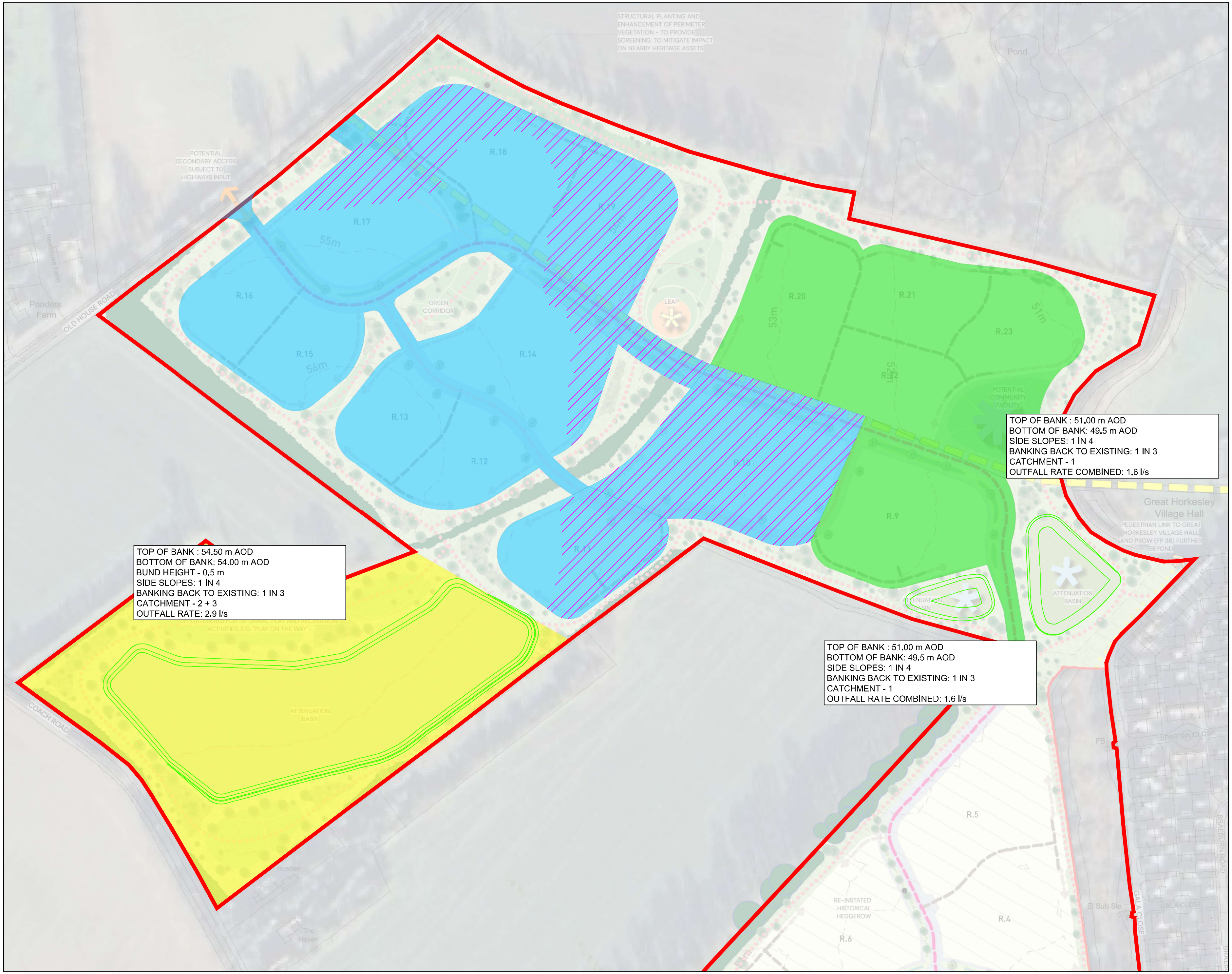
cannon
CONSULTING ENGINEERS

Appended information

Drawing S631-PL-SK-350 illustrative surface water management plan

Causeway Flow calculations – attenuation

Causeway Flow calculations – infiltration



KEY

CATCHMENT 1: 2.7 ha
ASSUMED 70%
IMPERMEABLE: 1.89 ha

CATCHMENT 2: 5.55 ha
ASSUMED 70%
IMPERMEABLE: 3.88 ha

CATCHMENT 3
(BASIN CATCHMENT): 3.25 ha

AREA OF RAISING STC

NOTES

REV	DESCRIPTION	DE	DR	CH	DATE

DESIGNED BY	DRAWN BY	CHECKED BY
-	JB	-

SCALE @ A1 SIZE	DATE
D.N.S	18.11.25

PROJECT TITLE
LAND SOUTH OF HORSEHEATH ROAD, LINTON

DRAWING TITLE
PHASE 2 OUTLINE SURFACE WATER STRATEGY

CLIENT
ENDURANCE ESTATES

CONSULTING ENGINEERS
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DRAWING NUMBER	REV.
S631 - PL - SK - 350	-

M:\S631 Land at Horkesley, Colchester, ESSEX\DRAWINGS\AUTOCAD\CURRENT DRGS\S631 - PL - SK - 350 - OUTLINE SW STRATEGY PHASE 2 hr wallingford

Greenfield runoff rate estimation tool

www.uksuds.com | Greenfield runoff rate estimation tool (https://www.uksuds.com/)

This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance "Rainfall runoff management for developments", SC030219 (2013), the SuDS Manual C753 (CIRIA, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Project details

Date	14/11/2025
Calculated by	JB
Reference	S631 - PHASE 2
Model version	2.2.2

Location

Site name	S631 PHASE 2
Site location	GT HORKESLEY

© OpenStreetMap (https://www.openstreetmap.org/copyright) contributors.

Site easting (British National Grid)	597273
Site northing (British National Grid)	229563

Site details

Total site area (ha)	1 ha

Greenfield runoff

Method

Method	FEH statistical (2025)

FEH statistical (2025)

	My value	Map value
SAAR9120 (mm)	611 mm	
BFIHOST19scaled	0.672	
QMed-QBar conversion	1.136	1.136
QMed (l/s)	1 l/s	
QBar (FEH statistical 2025) (l/s)	1.1 l/s	

Growth curve factors

	My value	Map value
Hydrological region	6	6
1 year growth factor	0.85	
2 year growth factor	0.88	
10 year growth factor	1.62	
30 year growth factor	2.3	
100 year growth factor	3.19	
200 year growth factor	3.74	

Results

Method	FEH statistical (2025)
Flow rate 1 year (l/s)	0.9 l/s
Flow rate 2 year (l/s)	1.0 l/s
Flow rate 10 years (l/s)	1.7 l/s
Flow rate 30 years (l/s)	2.5 l/s
Flow rate 100 years (l/s)	3.4 l/s
Flow rate 200 years (l/s)	4.0 l/s

Please note runoff estimation is subject to significant uncertainty. Results are therefore normally reported to only 1 decimal place. Where 2 decimal places are provided, this does not indicate accuracy to this level, it has been adopted to prevent 'zero' figures from being reported. Outputs less than 0.01 l/s are reported as 0.01 l/s.

Disclaimer

This report was produced using the Greenfield runoff rate estimation tool (2.2.2) developed by HR Wallingford and available at uksuds.com (https://www.uksuds.com/). The use of this tool is subject to the UK SuDS terms and conditions and licence agreement, which can both be found at uksuds.com/terms-conditions (https://www.uksuds.com/terms-conditions). The outputs from this tool have been used to estimate Greenfield runoff rates. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, Centre for Ecology and Hydrology, Wallingford Hydrosolutions or any other organisation for the use of these data in the design or operational characteristics of any drainage scheme.

Design Settings

Rainfall Methodology	FEH-22	Minimum Velocity (m/s)	1.00
Return Period (years)	100	Connection Type	Level Soffits
Additional Flow (%)	0	Minimum Backdrop Height (m)	0.200
CV	1.000	Preferred Cover Depth (m)	1.200
Time of Entry (mins)	5.00	Include Intermediate Ground	✓
Maximum Time of Concentration (mins)	30.00	Enforce best practice design rules	✓
Maximum Rainfall (mm/hr)	500.0		

Nodes

Name	Area (ha)	Cover Level (m)	Depth (m)
BASIN 1	1.890	51.000	1.500

Simulation Settings

Rainfall Methodology	FEH-22	Analysis Speed	Normal	Starting Level (m)	
Rainfall Events	Singular	Skip Steady State	x	Check Discharge Rate(s)	x
Summer CV	1.000	Drain Down Time (mins)	10080	Check Discharge Volume	x
Winter CV	1.000	Additional Storage (m³/ha)	0.0		

Storm Durations

15	60	180	360	600	960	2160	4320	7200	10080
30	120	240	480	720	1440	2880	5760	8640	

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
100	45	5	0

Node BASIN 1 Online Orifice Control

Flap Valve	x	Design Depth (m)	1.200	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	1.7		
Invert Level (m)	49.500	Diameter (m)	0.027		

Node BASIN 1 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	49.500
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	1338.0	0.0	1.500	2352.0	0.0

Node BASIN 1 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	49.500
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	192.0	0.0	1.500	745.0	0.0

Results for 100 year +45% CC +5% A Critical Storm Duration. Lowest mass balance: 99.99%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
10080 minute winter	BASIN 1	9660	50.681	1.181	13.3	2535.1120	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
10080 minute winter	BASIN 1	Orifice	1.6	1573.8

Design Settings

Rainfall Methodology	FEH-22	Minimum Velocity (m/s)	1.00
Return Period (years)	100	Connection Type	Level Soffits
Additional Flow (%)	0	Minimum Backdrop Height (m)	0.200
CV	0.660	Preferred Cover Depth (m)	1.200
Time of Entry (mins)	5.00	Include Intermediate Ground	✓
Maximum Time of Concentration (mins)	30.00	Enforce best practice design rules	✓
Maximum Rainfall (mm/hr)	500.0		

Nodes

Name	Area (ha)	Cover Level (m)	Depth (m)
BASIN 2	7.130	54.500	0.500

Simulation Settings

Rainfall Methodology	FEH-22	Analysis Speed	Normal	Starting Level (m)	
Rainfall Events	Singular	Skip Steady State	x	Check Discharge Rate(s)	x
Summer CV	0.660	Drain Down Time (mins)	10080	Check Discharge Volume	x
Winter CV	0.660	Additional Storage (m³/ha)	0.0		

Storm Durations

15	60	180	360	600	960	2160	4320	7200	10080
30	120	240	480	720	1440	2880	5760	8640	

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
100	45	5	0

Node BASIN 2 Online Orifice Control

Flap Valve	x	Design Depth (m)	0.500	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	2.9		
Invert Level (m)	54.000	Diameter (m)	0.045		

Node BASIN 2 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	54.000
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	13168.0	0.0	0.500	14316.0	0.0

Results for 100 year +45% CC +5% A Critical Storm Duration. Lowest mass balance: 99.99%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
10080 minute winter	BASIN 2	9840	54.499	0.499	33.1	6857.2180	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
10080 minute winter	BASIN 2	Orifice	2.9	2728.6

Design Settings

Rainfall Methodology	FEH-22	Minimum Velocity (m/s)	1.00
Return Period (years)	100	Connection Type	Level Soffits
Additional Flow (%)	0	Minimum Backdrop Height (m)	0.200
CV	1.000	Preferred Cover Depth (m)	1.200
Time of Entry (mins)	5.00	Include Intermediate Ground	✓
Maximum Time of Concentration (mins)	30.00	Enforce best practice design rules	✓
Maximum Rainfall (mm/hr)	500.0		

Nodes

Name	Area (ha)	Cover Level (m)	Depth (m)
BASIN 1	1.890	51.000	1.500

Simulation Settings

Rainfall Methodology	FEH-22	Analysis Speed	Normal	Starting Level (m)	
Rainfall Events	Singular	Skip Steady State	x	Check Discharge Rate(s)	x
Summer CV	1.000	Drain Down Time (mins)	10080	Check Discharge Volume	x
Winter CV	1.000	Additional Storage (m³/ha)	0.0		

Storm Durations

15	60	180	360	600	960	2160	4320	7200	10080
30	120	240	480	720	1440	2880	5760	8640	

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
100	45	5	0

Node BASIN 1 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00360	Safety Factor	5.0	Invert Level (m)	49.500
Side Inf Coefficient (m/hr)	0.00360	Porosity	1.00	Time to half empty (mins)	37066

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	1338.0	2352.0	1.500	2352.0	2352.0

Node BASIN 1 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00360	Safety Factor	5.0	Invert Level (m)	49.500
Side Inf Coefficient (m/hr)	0.00360	Porosity	1.00	Time to half empty (mins)	27732

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	192.0	745.0	1.500	745.0	745.0

Results for 100 year +45% CC +5% A Critical Storm Duration. Lowest mass balance: 99.99%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
10080 minute winter	BASIN 1	9960	50.786	1.286	13.3	2831.4810	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	Outflow (l/s)
10080 minute winter	BASIN 1	Infiltration	0.5
10080 minute winter	BASIN 1	Infiltration	0.1

Design Settings

Rainfall Methodology	FEH-22	Minimum Velocity (m/s)	1.00
Return Period (years)	100	Connection Type	Level Soffits
Additional Flow (%)	0	Minimum Backdrop Height (m)	0.200
CV	0.660	Preferred Cover Depth (m)	1.200
Time of Entry (mins)	5.00	Include Intermediate Ground	✓
Maximum Time of Concentration (mins)	30.00	Enforce best practice design rules	✓
Maximum Rainfall (mm/hr)	500.0		

Nodes

Name	Area (ha)	Cover Level (m)	Depth (m)
BASIN 2	7.130	54.500	0.500

Simulation Settings

Rainfall Methodology	FEH-22	Analysis Speed	Normal	Starting Level (m)	
Rainfall Events	Singular	Skip Steady State	x	Check Discharge Rate(s)	x
Summer CV	0.660	Drain Down Time (mins)	10080	Check Discharge Volume	x
Winter CV	0.660	Additional Storage (m³/ha)	0.0		

Storm Durations

15	60	180	360	600	960	2160	4320	7200	10080
30	120	240	480	720	1440	2880	5760	8640	

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
100	45	5	0

Node BASIN 2 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00360	Safety Factor	5.0	Invert Level (m)	54.000
Side Inf Coefficient (m/hr)	0.00360	Porosity	1.00	Time to half empty (mins)	8396

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	13168.0	13168.0	0.500	14316.0	14334.6

Results for 100 year +45% CC +5% A Critical Storm Duration. Lowest mass balance: 99.99%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
10080 minute winter	BASIN 2	9840	54.475	0.475	33.1	6510.6110	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	Outflow (l/s)
10080 minute winter	BASIN 2	Infiltration	2.9