

Site Evolution Ltd
Proposed Housing Development,
Rheda Park North,
Frizington.
Drainage Strategy and Calculations



Civil Engineers
Structural Engineers
Project Managers

Document No: AA7281/9/1/2

Asher Associates Ltd
32 George Street
DUMFRIES
DG1 1EH

	Name	Signature	Date
Prepared by	William Milne		22.08.24
Purpose of Issue	Planning Application		

22 August 2024

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Introduction

This proposed 22-unit development is located on a greenfield site to the West Frizington. The site is a continuation of the 'Beckstones' development completed by Genesis Homes. The proposed site was granted outline planning permission in 2018 (ref: 4/18/2426/001). Asher Associates Ltd have been commissioned to prepare designs to discharge reserved matter conditions 4, 7, 9, 10, 15, 16, 17 and 18 of the outline approval.

Site Description

The topography of this site falls from a central crest to the boundaries in north, east and west. The ground surface continues to fall to the north beyond the site boundary and is within the Dub Beck catchment.

The underlying soils are clay to variable depths over gravel and weathered bedrock which is suitable for surface water disposal by infiltration. Infiltration testing was carried out by Geo Environmental Engineering in July 2022. Three of the four tests undertaken were successful. Test 3 was abandoned as it was carried out in the clay layer above the permeable substrate. There will be a SUDS infiltration feature at this location. The bottom of the feature shall be excavated down to the gravel layer allowing infiltration from the base only.

Foul Water Design

The design of the foul drainage network installed in the first phase of the development does not cater for a gravity system in this phase. A private foul network will be installed for phase two and will discharge to an adoptable pumping station in the public open space to the east of the development.

Surface Water Design

The development will be drained via a private network with infiltration SUDS and a flow control before discharging at greenfield rate to a ditch in the Dub Beck catchment. The western part of the development has filter drains along the site boundary to intercept overland flows from the site and prevent them entering adjacent properties.

Surface water run-off from adopted surfaces will be conveyed to infiltration SUDS via highway drains. Due to the site topography, there will be two separate drain runs to the east and west of the central crest. The drain runs will have an infiltration blanket to provide storage and afford disposal. Each drain run will have a high-level overflow connected to the private drainage network for exceedance purposes. Catchpits will be installed upstream of the infiltration features to prevent silting.

Greenfield runoff rates for the development site:

Greenfield runoff rates were calculated using HR Wallingford's Greenfield runoff rate estimation for sites and the following value was obtained for the positively drained site and a 30% run-off from landscape and gardens giving a total contributing area of 1.2ha. Peak surface water discharge from the site is to be discharged at $Q_{Bar} = 12.18\text{l/s}$.

Calculations: All calculations are as prescribed by the Wallingford Procedure – ‘Modified Rational Method’ and use the parameters set out in Design and construction Guidance for foul and surface water sewers version 2.1 as the design criteria. The Causeway Flow application was used to generate various rainfall events with return periods of 1, 30 & 100 years.

The design criteria for the network is as follows:

Design Storm, pipes full	2 year
Design Storm, no flooding	30 year
Flood Risk Assessment	100 year
Minimum velocity, pipe full	1m/sec
Ks roughness value	0.6mm
Time of Entry	5 mins
Contributing Area classification:	
Impervious areas	100%

For all storm simulations the model was set to record a flood risk when manhole surcharge reached a level of 300mm below the cover level. A 40% uplift for climate change was added to the design storms. A further 10% was added to the impervious areas contributing to the proposed networks to allow for urban creep. The model was also run for a 50% climate change uplift in accordance with the South Lakes Management Catchment Peak Rainfall Allowances. Run-off from landscape and garden areas has been factored into the design calculations at 40% impermeability.

Where possible, a minimum cover of 1200mm has been applied to pipework under roads and 900mm in open ground. Where cover is less than 1200mm below the road, concrete protection will be applied to pipework.

Critical Storms:

The network was modelled in Causeway Flow to ensure that no flooding is experienced for storms with a return period of up to 30 years and also to establish the critical storms with return periods of 1, 30 and 100 years for use in the network simulation. The critical storms for the network were established during this process and are presented in the Flow calculations.

Network Simulation:

The network including all manholes, pipes, storage features and flow control was simulated for the critical storm events shown in the Causeway Flow calculations.

During the 2-year return period critical storms all flows are contained within the system. Some minor surcharging was experienced at the lowest points in each system during the 2-year return period critical storms.

During the 30-year return period critical storms all flows are contained within the system, some surcharging is evident in the manholes. No flooding is experienced at any point in the system during the 30-year return period critical storms.

No flooding is experienced in the system during the 100-year +40% climate change return period critical storms.

A further simulation using the upper end allowance 1% peak annual rainfall event 100yr +50% Climate Change event for the South Lakes Management Catchment upper limit. No flooding was recorded.

Greenfield Runoff Calculation

Calculated by:	Ryan Johnston
Site name:	Rheda Park Phase 2
Site location:	

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.

Site Details

Latitude:	54.53846° N
Longitude:	3.49979° W
Reference:	687027822
Date:	Aug 23 2024 10:38

Runoff estimation approach

IH124

Site characteristics

Total site area (ha):	1.20
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Methodology

Q_{BAR} estimation method:	Calculate from SPR and SAAR
SPR estimation method:	Calculate from SOIL type

Notes

(1) Is $Q_{BAR} < 2.0$ l/s/ha?

When Q_{BAR} is < 2.0 l/s/ha then limiting discharge rates are set at 2.0 l/s/ha.

Soil characteristics

	Default	Edited
SOIL type:	4	4
HOST class:	N/A	N/A
SPR/SPRHOST:	0.47	0.47

(2) Are flow rates < 5.0 l/s?

Where flow rates are less than 5.0 l/s consent for discharge is usually set at 5.0 l/s if blockage from vegetation and other materials is possible. Lower consent flow rates may be set where the blockage risk is addressed by using appropriate drainage elements.

Hydrological characteristics

	Default	Edited
SAAR (mm):	1377	1377
Hydrological region:	10	10
Growth curve factor 1 year:	0.87	0.87
Growth curve factor 30 years:	1.7	1.7
Growth curve factor 100 years:	2.08	2.08
Growth curve factor 200 years:	2.37	2.37

(3) Is $SPR/SPRHOST \leq 0.3$?

Where groundwater levels are low enough the use of soakaways to avoid discharge offsite would normally be preferred for disposal of surface water runoff.

Greenfield runoff rates

Default

Edited

Q_{BAR} (l/s):	12.79	12.79
1 in 1 year (l/s):	11.12	11.12
1 in 30 years (l/s):	21.74	21.74
1 in 100 year (l/s):	26.59	26.59
1 in 200 years (l/s):	30.3	30.3

This report was produced using the greenfield runoff tool developed by HR Wallingford and available at 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 www.uksuds.com/terms-and-conditions.htm. The outputs from this tool are estimates of 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, CEH, Hydrosolutions or any other organisation for the use of this data in the design or operational characteristics of any drainage scheme.

Percolation Testing Report

Mr Ian Storey
T: 07970 283140
E: ian.storey@siteevolution.co.uk

Site Evolution Limited
14 Pinecroft, Carlisle,
United Kingdom, CA3 0DB

Date: 08.07.2022

Project No: GEO2022-5394

Project Title: Land at Rheda Phase 2 – Soil Infiltration Test Report

Introduction:

Geo Environmental Engineering Ltd (GEO) were commissioned by Mr Ian Storey to carry out soil infiltration tests for the proposed residential development at a site at Rheda, near Frizington, Cumbria.

The site works were completed on the 7th July 2022 and comprised 4 No. trial pits (PT1 to PT4) with in-situ soil infiltration testing (soakaway tests to BRE365 methodology). A copy of the exploratory hole location plan and the trial pit logs are enclosed.

Ground Conditions:

The trial pits typically encountered topsoil overlying sandy tabular/angular gravel of sandstone with cobbles and boulders. PT3 differed in that this location noted topsoil over clay soils. All the trial pits remained dry, with no water ingress noted. All the trial pits were noted as stable.

In-situ Testing:

Soil Infiltration tests were completed in all four trial pits to the BRE365 methodology. This involved partially filling the pits with water and monitoring the water levels until the water had drained sufficiently to calculate a soil infiltration rate. A summary of the results is below:

- PT1: Three tests were completed within PT1 from starting depths of c.0.90m to c.1.00m below ground level, to the base of the trial pit.

Test 1 took 12 minutes to complete, and this equates to a soil infiltration rate of 1.4×10^{-04} m/s.

Test 2 took 16 minutes to complete, and this equates to a soil infiltration rate of 1.1×10^{-04} m/s.

Test 3 took 20 minutes to complete, and this equates to a soil infiltration rate of 8.6×10^{-05} m/s.

All the above results at PT1 would equate to soil with good drainage characteristics and a medium permeability classification.

- PT2: Three tests were completed within PT2 from starting depths of c.0.35m to c.0.40m below ground level, to the base of the trial pit.

Test 1 took 60 minutes to complete, and this equates to a soil infiltration rate of 2.9×10^{-05} m/s.

Test 2 took 97 minutes to complete, and this equates to a soil infiltration rate of 1.8×10^{-05} m/s.

Test 3 took 94 minutes to complete, and this equates to a soil infiltration rate of 1.9×10^{-05} m/s.

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Site Investigation Steering Group (SISG), 1993

All the above results at PT2 would equate to soil with good drainage characteristics and a medium permeability classification.

- PT3: One test was completed at PT3. The test commenced at c.0.60m below ground level. Following a 300-minute monitoring period the water had only drained c.0.96m in total. This test was considered as a failure as it had not fallen enough during the time allocated for the fieldworks to determine a soil infiltration rate.
- PT4: Three tests were completed within PT4 from starting depths of c.0.45m to c.0.50m below ground level, to the base of the trial pit.

Test 1 took 30 minutes to complete, and this equates to a soil infiltration rate of 5.8×10^{-05} m/s.
Test 2 took 48 minutes to complete, and this equates to a soil infiltration rate of 3.6×10^{-05} m/s.
Test 3 took 56 minutes to complete, and this equates to a soil infiltration rate of 3.1×10^{-05} m/s.

All the above results would equate to soil with good drainage characteristics and a medium permeability classification.

The results of the tests should therefore be passed to a Civil Engineer to determine an appropriate drainage design.

Exploratory Hole Locations:

A surveyor was present on site to record the trial pit locations, with the details below:

Exploratory Hole	Easting	Northing	Ground Level
PT1	302615.825	516814.448	144.500
PT2	302691.974	516843.717	146.900
PT3	302772.183	516867.664	141.704
PT4	302637.381	516896.808	142.500

General Comments:

Consideration must be made for variations to occur in the ground conditions between the exploratory hole locations for which GEO holds no responsibility. It is therefore recommended that a “watching brief” be applied to ensure that if ground conditions appear to vary from those identified within this investigation, then advice should be sought from a suitably qualified and experienced Geo-Environmental Engineer.

The recommendations and opinions expressed in this report are based on the ground conditions observed. Consequently, GEO takes no responsibility for conditions that have not been revealed or which occur between them.

The conclusions and recommendations presented within this report are considered reasonable based on the available information. However, these cannot be guaranteed to gain regulatory approval. Therefore, the report should be passed to the appropriate regulatory authorities and/ or other key stakeholders, including warranty providers in order to seek their approval of the findings prior to undertaking any development works on site.

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Site Investigation Steering Group (SISG), 1993



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If there are any queries, please do not hesitate to contact Geo-Environmental Engineering Ltd.

Yours Faithfully

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Curtis R Evans *BSc (Hons), FGS*
Director - Geo Environmental Engineering Limited
Tel: 01900 826 027, Mob: 07883 440 186

GEO2022-5394: Rheda Phase 2

Exploratory Hole Location Plan – Approximate Locations – Not to Scale

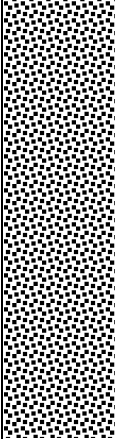


Website: www.geoenvironmentalengineering.com

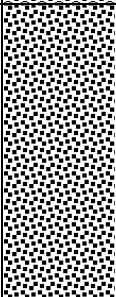
Email: info@geoenvironmentalengineering.com

Telephone: 01900 826 027 / 07883 440 186

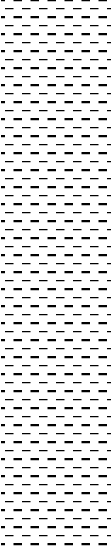
GEO2022-5394: Rheda Phase 2 – PT1

Depth From (m)	Depth To (m)	Strata Description	Legend	Testing / Samples
0.00	0.20	TOPSOIL: Grass over brown slightly sandy slightly gravelly LOAM(TOPSOIL).		No samples retained
0.20	1.70	Brown slightly clayey angular/tabular GRAVEL of SANDSTONE with occasional cobbles and boulders. 1.70 Difficult to excavate, unable to continue deeper.		Soakaway Test Completed
Log Notes: End of trial hole at 1.70m. Trial hole remained open and dry on completion. Trial hole backfilled with arisings on completion.				
Site: Rheda Phase 2 Engineer: CR Evans Site Works Date: 08/07/2022 Plant: Tracked 360 Excavator supplied by Client			Log Key: HSV = Hand Shear Vane (kN/m ²) CBR = California Bearing Ratio (%) B = Bulk Bag, J = Amber Glass Jar, T = Plastic Tub	
				

GEO2022-5394: Rheda Phase 2 – PT2

Depth From (m)	Depth To (m)	Strata Description	Legend	Testing / Samples
0.00	0.25	TOPSOIL: Grass over brown slightly sandy slightly gravelly LOAM(TOPSOIL).		No samples retained
0.25	1.15	Brown angular/tabular GRAVEL of SANDSTONE with occasional cobbles and boulders. 1.15 Difficult to excavate, unable to continue deeper.		Soakaway Test Completed
Log Notes: End of trial hole at 1.70m. Trial hole remained open and dry on completion. Trial hole backfilled with arisings on completion.				
Site: Rheda Phase 2 Engineer: CR Evans Site Works Date: 08/07/2022 Plant: Tracked 360 Excavator supplied by Client			Log Key: HSV = Hand Shear Vane (kN/m ²) CBR = California Bearing Ratio (%) B = Bulk Bag, J = Amber Glass Jar, T = Plastic Tub	
				

GEO2022-5394: Rheda Phase 2 – PT3

Depth From (m)	Depth To (m)	Strata Description	Legend	Testing / Samples
0.00	0.30	TOPSOIL: Grass over brown slightly sandy slightly gravelly LOAM(TOPSOIL).		No samples retained
0.30	2.30	Red brown slightly sandy slightly gravelly CLAY.		Soakaway Test Completed

Log Notes:

End of trial hole at 2.30m.
Trial hole remained open and dry on completion.
Trial hole backfilled with arisings on completion.

Site: Rheda Phase 2

Engineer: CR Evans

Site Works Date: 08/07/2022

Plant: Tracked 360 Excavator supplied by Client

Log Key:

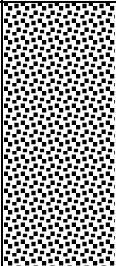
HSV = Hand Shear Vane (kN/m²)

CBR = California Bearing Ratio (%)

B = Bulk Bag, J = Amber Glass Jar, T = Plastic Tub



GEO2022-5394: Rheda Phase 2 – PT4

Depth From (m)	Depth To (m)	Strata Description	Legend	Testing / Samples
0.00	0.30	TOPSOIL: Grass over brown slightly sandy slightly gravelly LOAM(TOPSOIL).		No samples retained
0.30	1.30	Brown slightly clayey angular/tabular GRAVEL of SANDSTONE with occasional cobbles and boulders. 1.30 Difficult to excavate, unable to continue deeper.		Soakaway Test Completed
Log Notes: End of trial hole at 1.30m. Trial hole remained open and dry on completion. Trial hole backfilled with arisings on completion.				
Site: Rheda Phase 2 Engineer: CR Evans Site Works Date: 08/07/2022 Plant: Tracked 360 Excavator supplied by Client			Log Key: HSV = Hand Shear Vane (kN/m ²) CBR = California Bearing Ratio (%) B = Bulk Bag, J = Amber Glass Jar, T = Plastic Tub	
				

GEO2022-5394: Rheda Phase 2 – Site Works Photographs



SOIL INFILTRATION TEST CALCULATION SHEET

SITE: Land at Rheda (Phase 2)
JOB NO: 2022-5394
TRIAL PIT: PT1
TEST NO.: 1

GROUND CONDITIONS: See Trial Pit Logs for Details

TEST HOLE SIZE:

Width 350 mm
 Length 1400 mm
 Depth of hole 1700 mm
 Change Water Level 700 mm

MONITORING RESULTS:

Recorded Time			Total Time (secs)	Depth of water (mm)
Hours	Minutes	Seconds		
0	0	0	0	0
0	12	0	720	1700
0		0	0	
0		0	0	
0		0	0	
0		0	0	
0		0	0	
0		0	0	

PERCOLATION TEST RESULTS AND SOIL INFILTRATION ASSESSMENT

TEST NO.: 1

SOIL INFILTRATION RATE ASSESSMENT:

Vol. Outflowing between 75% and 25% effective depth:

$V_{p75-25} = 0.1715 \text{ m}^3$

Mean surface area (pit sides to 50% effective depth + base of pit):

$A_{p50} = 1.715 \text{ m}^2$

Time for the outflow between 75% and 25% effective depth:

$t_{p75-25} = 720 \text{ secs}$

Soil Infiltration rate:

$f = 1.4\text{E-}04 \text{ m/s}$

SOIL INFILTRATION TEST CALCULATION SHEET

SITE: Land at Rheda (Phase 2)
JOB NO: 2022-5394
TRIAL PIT: PT1
TEST NO.: 2

GROUND CONDITIONS: See Trial Pit Logs for Details

TEST HOLE SIZE:

Width 350 mm
 Length 1400 mm
 Depth of hole 1700 mm
 Change Water Level 800 mm

MONITORING RESULTS:

Recorded Time			Total Time (secs)	Depth of water (mm)
Hours	Minutes	Seconds		
0	0	0	0	0
0	16	0	960	1700
0		0	0	
0		0	0	
0		0	0	
0		0	0	
0		0	0	
0		0	0	

PERCOLATION TEST RESULTS AND SOIL INFILTRATION ASSESSMENT

TEST NO.: 2

SOIL INFILTRATION RATE ASSESSMENT:

Vol. Outflowing between 75% and 25% effective depth:

$V_{p75-25} = 0.196 \text{ m}^3$

Mean surface area (pit sides to 50% effective depth + base of pit):

$A_{p50} = 1.89 \text{ m}^2$

Time for the outflow between 75% and 25% effective depth:

$t_{p75-25} = 960 \text{ secs}$

Soil Infiltration rate:

$f = 1.1\text{E-}04 \text{ m/s}$

SOIL INFILTRATION TEST CALCULATION SHEET

SITE: Land at Rheda (Phase 2)
JOB NO: 2022-5394
TRIAL PIT: PT1
TEST NO.: 3

GROUND CONDITIONS: See Trial Pit Logs for Details

TEST HOLE SIZE:

Width 350 mm
 Length 1400 mm
 Depth of hole 1700 mm
 Change Water Level 800 mm

MONITORING RESULTS:

Recorded Time			Total Time (secs)	Depth of water (mm)
Hours	Minutes	Seconds		
0	0	0	0	0
0	20	0	1200	1700
0		0	0	
0		0	0	
0		0	0	
0		0	0	
0		0	0	
0		0	0	

PERCOLATION TEST RESULTS AND SOIL INFILTRATION ASSESSMENT

TEST NO.: 3

SOIL INFILTRATION RATE ASSESSMENT:

Vol. Outflowing between 75% and 25% effective depth:

$V_{p75-25} = 0.196 \text{ m}^3$

Mean surface area (pit sides to 50% effective depth + base of pit):

$A_{p50} = 1.89 \text{ m}^2$

Time for the outflow between 75% and 25% effective depth:

$t_{p75-25} = 1200 \text{ secs}$

Soil Infiltration rate:

$f = 8.6\text{E-}05 \text{ m/s}$

SOIL INFILTRATION TEST CALCULATION SHEET

SITE: Land at Rheda (Phase 2)
JOB NO: 2022-5394
TRIAL PIT: PT2
TEST NO.: 1

GROUND CONDITIONS: See Trial Pit Logs for Details

TEST HOLE SIZE:

Width 350 mm
 Length 1500 mm
 Depth of hole 1150 mm
 Change Water Level 750 mm

MONITORING RESULTS:

Recorded Time			Total Time (secs)	Depth of water (mm)
Hours	Minutes	Seconds		
0	0	0	0	0
0	60	0	3600	1150
0		0	0	
0		0	0	
0		0	0	
0		0	0	
0		0	0	
0		0	0	

PERCOLATION TEST RESULTS AND SOIL INFILTRATION ASSESSMENT

TEST NO.: 1

SOIL INFILTRATION RATE ASSESSMENT:

Vol. Outflowing between 75% and 25% effective depth:

$V_{p75-25} = 0.196875 \text{ m}^3$

Mean surface area (pit sides to 50% effective depth + base of pit):

$A_{p50} = 1.9125 \text{ m}^2$

Time for the outflow between 75% and 25% effective depth:

$t_{p75-25} = 3600 \text{ secs}$

Soil Infiltration rate:

$f = 2.9\text{E-}05 \text{ m/s}$

SOIL INFILTRATION TEST CALCULATION SHEET

SITE: Land at Rheda (Phase 2)
JOB NO: 2022-5394
TRIAL PIT: PT2
TEST NO.: 2

GROUND CONDITIONS: See Trial Pit Logs for Details

TEST HOLE SIZE:

Width 350 mm
 Length 1500 mm
 Depth of hole 1150 mm
 Change Water Level 750 mm

MONITORING RESULTS:

Recorded Time			Total Time (secs)	Depth of water (mm)
Hours	Minutes	Seconds		
0	0	0	0	0
0	97	0	5820	1150
0		0	0	
0		0	0	
0		0	0	
0		0	0	
0		0	0	
0		0	0	

PERCOLATION TEST RESULTS AND SOIL INFILTRATION ASSESSMENT

TEST NO.: 2

SOIL INFILTRATION RATE ASSESSMENT:

Vol. Outflowing between 75% and 25% effective depth:

$V_{p75-25} = 0.196875 \text{ m}^3$

Mean surface area (pit sides to 50% effective depth + base of pit):

$A_{p50} = 1.9125 \text{ m}^2$

Time for the outflow between 75% and 25% effective depth:

$t_{p75-25} = 5820 \text{ secs}$

Soil Infiltration rate:

$f = 1.8\text{E-}05 \text{ m/s}$

SOIL INFILTRATION TEST CALCULATION SHEET

SITE: Land at Rheda (Phase 2)
JOB NO: 2022-5394
TRIAL PIT: PT2
TEST NO.: 3

GROUND CONDITIONS: See Trial Pit Logs for Details

TEST HOLE SIZE:

Width 350 mm
 Length 1500 mm
 Depth of hole 1150 mm
 Change Water Level 800 mm

MONITORING RESULTS:

Recorded Time			Total Time (secs)	Depth of water (mm)
Hours	Minutes	Seconds		
0	0	0	0	0
0	94	0	5640	1150
0		0	0	
0		0	0	
0		0	0	
0		0	0	
0		0	0	
0		0	0	

PERCOLATION TEST RESULTS AND SOIL INFILTRATION ASSESSMENT

TEST NO.: 3

SOIL INFILTRATION RATE ASSESSMENT:

Vol. Outflowing between 75% and 25% effective depth:

$V_{p75-25} = 0.21 \text{ m}^3$

Mean surface area (pit sides to 50% effective depth + base of pit):

$A_{p50} = 2.005 \text{ m}^2$

Time for the outflow between 75% and 25% effective depth:

$t_{p75-25} = 5640 \text{ secs}$

Soil Infiltration rate:

$f = 1.9\text{E-}05 \text{ m/s}$

SOIL INFILTRATION TEST CALCULATION SHEET

SITE: Land at Rheda (Phase 2)
JOB NO: 2022-5394
TRIAL PIT: PT4
TEST NO.: 1

GROUND CONDITIONS: See Trial Pit Logs for Details

TEST HOLE SIZE:

Width 350 mm
 Length 1400 mm
 Depth of hole 1300 mm
 Change Water Level 800 mm

MONITORING RESULTS:

Recorded Time			Total Time (secs)	Depth of water (mm)
Hours	Minutes	Seconds		
0	0	0	0	0
0	30	0	1800	1300
0		0	0	
0		0	0	
0		0	0	
0		0	0	
0		0	0	
0		0	0	

PERCOLATION TEST RESULTS AND SOIL INFILTRATION ASSESSMENT

TEST NO.: 1

SOIL INFILTRATION RATE ASSESSMENT:

Vol. Outflowing between 75% and 25% effective depth:

$V_{p75-25} = 0.196 \text{ m}^3$

Mean surface area (pit sides to 50% effective depth + base of pit):

$A_{p50} = 1.89 \text{ m}^2$

Time for the outflow between 75% and 25% effective depth:

$t_{p75-25} = 1800 \text{ secs}$

Soil Infiltration rate:

$f = 5.8E-05 \text{ m/s}$

SOIL INFILTRATION TEST CALCULATION SHEET

SITE: Land at Rheda (Phase 2)
JOB NO: 2022-5394
TRIAL PIT: PT4
TEST NO.: 2

GROUND CONDITIONS: See Trial Pit Logs for Details

TEST HOLE SIZE:

Width 350 mm
 Length 1400 mm
 Depth of hole 1300 mm
 Change Water Level 800 mm

MONITORING RESULTS:

Recorded Time			Total Time (secs)	Depth of water (mm)
Hours	Minutes	Seconds		
0	0	0	0	0
0	48	0	2880	1300
0		0	0	
0		0	0	
0		0	0	
0		0	0	
0		0	0	
0		0	0	

PERCOLATION TEST RESULTS AND SOIL INFILTRATION ASSESSMENT

TEST NO.: 2

SOIL INFILTRATION RATE ASSESSMENT:

Vol. Outflowing between 75% and 25% effective depth:

$V_{p75-25} = 0.196 \text{ m}^3$

Mean surface area (pit sides to 50% effective depth + base of pit):

$A_{p50} = 1.89 \text{ m}^2$

Time for the outflow between 75% and 25% effective depth:

$t_{p75-25} = 2880 \text{ secs}$

Soil Infiltration rate:

$f = 3.6\text{E-}05 \text{ m/s}$

SOIL INFILTRATION TEST CALCULATION SHEET

SITE: Land at Rheda (Phase 2)
JOB NO: 2022-5394
TRIAL PIT: PT4
TEST NO.: 3

GROUND CONDITIONS: See Trial Pit Logs for Details

TEST HOLE SIZE:

Width 350 mm
 Length 1400 mm
 Depth of hole 1300 mm
 Change Water Level 850 mm

MONITORING RESULTS:

Recorded Time			Total Time (secs)	Depth of water (mm)
Hours	Minutes	Seconds		
0	0	0	0	0
0	56	0	3360	1300
0		0	0	
0		0	0	
0		0	0	
0		0	0	
0		0	0	
0		0	0	

PERCOLATION TEST RESULTS AND SOIL INFILTRATION ASSESSMENT

TEST NO.: 3

SOIL INFILTRATION RATE ASSESSMENT:

Vol. Outflowing between 75% and 25% effective depth:

$V_{p75-25} = 0.20825 \text{ m}^3$

Mean surface area (pit sides to 50% effective depth + base of pit):

$A_{p50} = 1.9775 \text{ m}^2$

Time for the outflow between 75% and 25% effective depth:

$t_{p75-25} = 3360 \text{ secs}$

Soil Infiltration rate:

$f = 3.1\text{E-}05 \text{ m/s}$



End of Report

“Without Site Investigation Ground is a Hazard”

Site Investigation Steering Group (SISG), 1993

GEO Environmental Engineering Ltd
North West (Registered Office):
4 Culgarth Avenue, Cockermouth, Cumbria CA13 9PL
North East:
19-20 Brenkley Way, Newcastle Upon Tyne, Tyne and Wear, NE13 6DS

Telephone: 01900 826 027
Email: info@geoenvironmentalengineering.com
Website: www.geoenvironmentalengineering.com
Company No.: 07180338
VAT No.: GB 986617072

Causeway Flow Calculations

Design Settings

Rainfall Methodology	FEH-22	Minimum Velocity (m/s)	0.75
Return Period (years)	30	Connection Type	Level Soffits
Additional Flow (%)	40	Minimum Backdrop Height (m)	5.000
CV	0.750	Preferred Cover Depth (m)	0.500
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)	50.0		

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
1	0.028	5.00	147.000	450	302711.122	516816.690	1.000
2	0.027	5.00	146.135	450	302718.986	516833.113	0.863
3			144.537	450	302742.391	516840.716	0.682
4	0.036	5.00	144.350	450	302744.422	516835.044	0.696
5	0.014	5.00	143.050	450	302765.162	516840.455	0.657
6			142.874	450	302776.415	516844.531	0.681
15	0.035	5.00	147.065	1200	302702.002	516816.821	1.400
16	0.023	5.00	146.823	1200	302697.839	516829.347	1.450
17	0.014	5.00	146.038	1200	302715.422	516841.746	1.350
18			142.580	1200	302764.113	516858.208	1.350
19			141.888	1200	302780.221	516870.920	1.350
20			141.538	1200	302778.107	516878.375	1.350
7	0.022	5.00	141.577	450	302765.920	516875.517	0.877
21	0.089	5.00	143.560	450	302668.202	516897.353	0.725
22	0.068	5.00	143.287	450	302714.229	516887.001	0.725
23			141.610	450	302758.067	516879.677	0.725
8			141.390	1200	302762.807	516881.421	1.116
24	0.026	5.00	146.512	450	302682.051	516835.565	1.400
25	0.044	5.00	146.118	450	302662.422	516830.810	1.450
26			144.672	450	302629.113	516803.173	1.450
27			145.047	1200	302624.191	516809.147	1.864
28			144.647	450	302614.257	516804.163	1.001
38	0.041	5.00	147.000	450	302694.276	516816.455	0.700
39	0.032	5.00	146.391	450	302670.174	516827.838	0.700
40	0.026	5.00	145.761	450	302643.839	516805.190	0.700
41	0.031	5.00	145.030	450	302619.998	516794.102	0.700
29	0.037	5.00	143.925	450	302598.614	516795.797	1.050
30			142.525	450	302573.732	516786.689	1.125
31	0.018	5.00	142.127	450	302570.406	516797.993	1.133
32	0.057	5.00	142.068	1200	302573.737	516814.798	1.784
33	0.034	5.00	142.100	1200	302580.173	516831.846	1.907
34	0.016	5.00	142.538	1200	302596.868	516848.309	2.462
42	0.037	5.00	145.820	450	302664.012	516853.709	0.600
43	0.068	5.00	145.787	450	302655.938	516836.851	0.749
44	0.081	5.00	143.807	450	302626.462	516850.883	0.650
45			143.045	450	302623.109	516866.433	0.650
35			142.618	1200	302611.538	516864.692	2.652
36	0.004	5.00	141.344	1200	302605.982	516884.602	1.809
37			141.345	1200	302675.011	516918.194	2.193
9			139.094	1200	302744.417	516932.463	1.807
10			138.342	1200	302740.393	516966.535	1.801
11			135.319	1200	302669.446	517000.030	0.997

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
12			132.585	450	302605.418	517011.858	0.997
13			130.610	450	302545.156	517057.825	1.001
14			130.384		302552.508	517071.039	0.851
46	0.023	5.00	145.856	1200	302705.910	516854.165	1.064
47	0.043	5.00	146.850	1200	302685.409	516795.643	1.225
48	0.018	5.00	145.000	1200	302639.418	516780.033	1.225
49	0.000		143.750	1200	302596.079	516765.323	1.225
50	0.017	5.00	143.147	1200	302580.902	516772.793	1.225
51	0.027	5.00	146.200		302737.768	516809.930	1.225
52	0.008	5.00	143.450		302774.877	516821.962	1.144

Links (Input)

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.000	1	2	18.208	0.600	146.000	145.272	0.728	25.0	100	5.20	50.0
1.001	2	3	24.609	0.600	145.272	143.905	1.367	18.0	150	5.37	50.0
1.002	3	4	6.024	0.600	143.855	143.654	0.201	30.0	150	5.42	50.0
1.003	4	5	21.434	0.600	143.654	142.393	1.261	17.0	150	5.57	50.0
1.004	5	6	11.969	0.600	142.393	142.193	0.200	59.8	225	5.69	50.0
1.005	6	7	32.715	0.600	142.193	140.766	1.427	22.9	225	5.98	50.0
2.000	15	16	13.199	0.600	145.665	145.423	0.242	54.5	100	5.21	50.0
2.001	16	17	21.515	0.600	145.373	144.688	0.685	31.4	150	5.41	50.0
2.002	17	18	51.398	0.600	144.688	141.230	3.458	14.9	150	5.74	50.0
2.003	18	19	20.520	0.600	141.230	140.538	0.692	29.7	150	5.92	50.0
2.004	19	20	7.749	0.600	140.538	140.188	0.350	22.1	150	5.98	50.0
2.005	20	7	12.517	0.600	140.813	140.750	0.063	198.7	100	6.37	50.0
1.006	7	8	6.675	0.600	140.700	140.349	0.351	19.0	225	6.40	50.0
3.000	21	22	47.177	0.600	142.835	142.562	0.273	172.8	225	5.79	50.0
3.001	22	23	44.446	0.600	142.562	140.885	1.677	26.5	225	6.08	50.0
3.002	23	8	5.051	0.600	140.885	140.683	0.202	25.0	225	6.12	50.0
1.007	8	9	54.254	0.600	140.274	137.363	2.911	18.6	225	6.70	50.0
4.000	24	25	20.197	0.600	145.112	144.718	0.394	51.3	100	5.31	50.0
4.001	25	26	43.282	0.600	144.668	143.222	1.446	29.9	150	5.70	50.0
4.002	26	27	7.741	0.600	143.222	143.183	0.039	198.5	150	5.88	50.0
4.003	27	28	11.114	0.600	143.878	143.646	0.232	47.9	100	6.05	50.0
4.004	28	29	17.740	0.600	143.646	142.925	0.721	24.6	100	6.24	50.0
5.000	38	39	26.655	0.600	146.300	145.691	0.609	43.8	150	5.29	50.0
5.001	39	40	34.734	0.600	145.691	145.061	0.630	55.1	150	5.72	50.0
5.002	40	41	26.293	0.600	145.061	144.330	0.731	36.0	225	5.92	50.0
5.003	41	29	21.452	0.600	144.330	142.875	1.455	14.7	225	6.02	50.0
4.005	29	30	26.497	0.600	142.875	141.475	1.400	18.9	225	6.39	50.0
4.006	30	31	11.783	0.600	141.400	140.994	0.406	29.0	225	6.47	50.0
4.007	31	32	17.133	0.600	140.994	140.359	0.635	27.0	225	6.58	50.0
4.008	32	33	18.222	0.600	140.284	140.193	0.091	200.2	300	6.85	50.0
4.009	33	34	23.447	0.600	140.193	140.076	0.117	200.4	300	7.21	50.0
4.010	34	35	21.992	0.600	140.076	139.966	0.110	199.9	300	7.54	50.0
6.000	42	43	18.691	0.600	145.220	145.038	0.182	102.7	150	5.31	50.0
6.001	43	44	32.646	0.600	145.039	143.207	1.832	17.8	150	5.54	50.0
6.002	44	45	15.907	0.600	143.157	142.395	0.762	20.9	225	5.63	50.0
6.003	45	35	11.700	0.600	142.395	141.664	0.731	16.0	225	5.69	50.0
4.011	35	36	20.670	0.600	139.966	139.535	0.431	48.0	300	7.69	50.0

Links (Input)

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
4.012	36	37	76.769	0.600	139.536	139.152	0.384	199.9	300	8.84	50.0
4.013	37	9	70.858	0.600	139.152	137.287	1.865	38.0	300	9.31	50.0
1.008	9	10	34.309	0.600	137.287	136.541	0.746	46.0	300	9.55	50.0
1.009	10	11	78.456	0.600	137.144	134.322	2.822	27.8	150	10.23	50.0
1.010	11	12	65.111	0.600	134.322	131.588	2.734	23.8	150	10.76	50.0
1.011	12	13	75.792	0.600	131.588	129.609	1.979	38.3	150	11.53	50.0
1.012	13	14	15.121	0.600	129.609	129.533	0.076	199.0	150	11.89	50.0
7.000	46	17	15.643	0.600	144.792	144.688	0.104	150.0	150	5.32	50.0
8.000	47	48	48.568	0.600	145.625	143.775	1.850	26.3	150	5.41	50.0
8.001	48	49	45.767	0.600	143.775	142.525	1.250	36.6	150	5.87	50.0
8.002	49	50	16.916	0.600	142.525	141.922	0.603	28.1	150	6.02	50.0
8.003	50	30	15.637	0.600	141.992	141.475	0.517	30.2	150	6.16	50.0
9.000	51	52	39.011	0.600	144.975	142.306	2.669	14.6	150	5.25	50.0
9.001	52	6	22.621	0.600	142.306	142.193	0.113	200.0	150	5.78	50.0

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.000	18.208	25.0	100	1 SW COMBINED02	147.000	146.000	0.900	146.135	145.272	0.763
1.001	24.609	18.0	150	1 SW COMBINED02	146.135	145.272	0.713	144.537	143.905	0.482
1.002	6.024	30.0	150	1 SW COMBINED02	144.537	143.855	0.532	144.350	143.654	0.546
1.003	21.434	17.0	150	1 SW COMBINED02	144.350	143.654	0.546	143.050	142.393	0.507
1.004	11.969	59.8	225	1 SW COMBINED02	143.050	142.393	0.432	142.874	142.193	0.456
1.005	32.715	22.9	225	1 SW COMBINED02	142.874	142.193	0.456	141.577	140.766	0.586
2.000	13.199	54.5	100	1 SW COMBINED02	147.065	145.665	1.300	146.823	145.423	1.300
2.001	21.515	31.4	150	1 SW COMBINED02	146.823	145.373	1.300	146.038	144.688	1.200
2.002	51.398	14.9	150	1 SW COMBINED02	146.038	144.688	1.200	142.580	141.230	1.200
2.003	20.520	29.7	150	1 SW COMBINED02	142.580	141.230	1.200	141.888	140.538	1.200
2.004	7.749	22.1	150	1 SW COMBINED02	141.888	140.538	1.200	141.538	140.188	1.200
2.005	12.517	198.7	100	1 SW COMBINED02	141.538	140.813	0.625	141.577	140.750	0.727
1.006	6.675	19.0	225	1 SW COMBINED02	141.577	140.700	0.652	141.390	140.349	0.816
3.000	47.177	172.8	225	1 SW COMBINED02	143.560	142.835	0.500	143.287	142.562	0.500
3.001	44.446	26.5	225	1 SW COMBINED02	143.287	142.562	0.500	141.610	140.885	0.500

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	1	450	Manhole	1 SW COMBINED02	2	450	Manhole	1 SW COMBINED02
1.001	2	450	Manhole	1 SW COMBINED02	3	450	Manhole	1 SW COMBINED02
1.002	3	450	Manhole	1 SW COMBINED02	4	450	Manhole	1 SW COMBINED02
1.003	4	450	Manhole	1 SW COMBINED02	5	450	Manhole	1 SW COMBINED02
1.004	5	450	Manhole	1 SW COMBINED02	6	450	Manhole	1 SW COMBINED02
1.005	6	450	Manhole	1 SW COMBINED02	7	450	Manhole	1 SW COMBINED02
2.000	15	1200	Manhole	1 SW COMBINED02	16	1200	Manhole	1 SW COMBINED02
2.001	16	1200	Manhole	1 SW COMBINED02	17	1200	Manhole	1 SW COMBINED02
2.002	17	1200	Manhole	1 SW COMBINED02	18	1200	Manhole	1 SW COMBINED02
2.003	18	1200	Manhole	1 SW COMBINED02	19	1200	Manhole	1 SW COMBINED02
2.004	19	1200	Manhole	1 SW COMBINED02	20	1200	Manhole	1 SW COMBINED02
2.005	20	1200	Manhole	1 SW COMBINED02	7	450	Manhole	1 SW COMBINED02
1.006	7	450	Manhole	1 SW COMBINED02	8	1200	Manhole	1 SW COMBINED02
3.000	21	450	Manhole	1 SW COMBINED02	22	450	Manhole	1 SW COMBINED02
3.001	22	450	Manhole	1 SW COMBINED02	23	450	Manhole	1 SW COMBINED02

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
3.002	5.051	25.0	225	1 SW COMBINED02	141.610	140.885	0.500	141.390	140.683	0.482
1.007	54.254	18.6	225	1 SW COMBINED02	141.390	140.274	0.891	139.094	137.363	1.506
4.000	20.197	51.3	100	1 SW COMBINED02	146.512	145.112	1.300	146.118	144.718	1.300
4.001	43.282	29.9	150	1 SW COMBINED02	146.118	144.668	1.300	144.672	143.222	1.300
4.002	7.741	198.5	150	1 SW COMBINED02	144.672	143.222	1.300	145.047	143.183	1.714
4.003	11.114	47.9	100	1 SW COMBINED02	145.047	143.878	1.069	144.647	143.646	0.901
4.004	17.740	24.6	100	1 SW COMBINED02	144.647	143.646	0.901	143.925	142.925	0.900
5.000	26.655	43.8	150	1 SW COMBINED02	147.000	146.300	0.550	146.391	145.691	0.550
5.001	34.734	55.1	150	1 SW COMBINED02	146.391	145.691	0.550	145.761	145.061	0.550
5.002	26.293	36.0	225	1 SW COMBINED02	145.761	145.061	0.475	145.030	144.330	0.475
5.003	21.452	14.7	225	1 SW COMBINED02	145.030	144.330	0.475	143.925	142.875	0.825
4.005	26.497	18.9	225	1 SW COMBINED02	143.925	142.875	0.825	142.525	141.475	0.825
4.006	11.783	29.0	225	1 SW COMBINED02	142.525	141.400	0.900	142.127	140.994	0.908
4.007	17.133	27.0	225	1 SW COMBINED02	142.127	140.994	0.908	142.068	140.359	1.484
4.008	18.222	200.2	300	1 SW COMBINED02	142.068	140.284	1.484	142.100	140.193	1.607
4.009	23.447	200.4	300	1 SW COMBINED02	142.100	140.193	1.607	142.538	140.076	2.162
4.010	21.992	199.9	300	1 SW COMBINED02	142.538	140.076	2.162	142.618	139.966	2.352
6.000	18.691	102.7	150	1 SW COMBINED02	145.820	145.220	0.450	145.787	145.038	0.599
6.001	32.646	17.8	150	1 SW COMBINED02	145.787	145.039	0.598	143.807	143.207	0.450
6.002	15.907	20.9	225	1 SW COMBINED02	143.807	143.157	0.425	143.045	142.395	0.425
6.003	11.700	16.0	225	1 SW COMBINED02	143.045	142.395	0.425	142.618	141.664	0.729
4.011	20.670	48.0	300	1 SW COMBINED02	142.618	139.966	2.352	141.344	139.535	1.509
4.012	76.769	199.9	300	1 SW COMBINED02	141.344	139.536	1.508	141.345	139.152	1.893
4.013	70.858	38.0	300	1 SW COMBINED02	141.345	139.152	1.893	139.094	137.287	1.507
1.008	34.309	46.0	300	1 SW COMBINED02	139.094	137.287	1.507	138.342	136.541	1.501

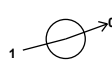
Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
3.002	23	450	Manhole	1 SW COMBINED02	8	1200	Manhole	1 SW COMBINED02
1.007	8	1200	Manhole	1 SW COMBINED02	9	1200	Manhole	1 SW COMBINED02
4.000	24	450	Manhole	1 SW COMBINED02	25	450	Manhole	1 SW COMBINED02
4.001	25	450	Manhole	1 SW COMBINED02	26	450	Manhole	1 SW COMBINED02
4.002	26	450	Manhole	1 SW COMBINED02	27	1200	Manhole	1 SW COMBINED02
4.003	27	1200	Manhole	1 SW COMBINED02	28	450	Manhole	1 SW COMBINED02
4.004	28	450	Manhole	1 SW COMBINED02	29	450	Manhole	1 SW COMBINED02
5.000	38	450	Manhole	1 SW COMBINED02	39	450	Manhole	1 SW COMBINED02
5.001	39	450	Manhole	1 SW COMBINED02	40	450	Manhole	1 SW COMBINED02
5.002	40	450	Manhole	1 SW COMBINED02	41	450	Manhole	1 SW COMBINED02
5.003	41	450	Manhole	1 SW COMBINED02	29	450	Manhole	1 SW COMBINED02
4.005	29	450	Manhole	1 SW COMBINED02	30	450	Manhole	1 SW COMBINED02
4.006	30	450	Manhole	1 SW COMBINED02	31	450	Manhole	1 SW COMBINED02
4.007	31	450	Manhole	1 SW COMBINED02	32	1200	Manhole	1 SW COMBINED02
4.008	32	1200	Manhole	1 SW COMBINED02	33	1200	Manhole	1 SW COMBINED02
4.009	33	1200	Manhole	1 SW COMBINED02	34	1200	Manhole	1 SW COMBINED02
4.010	34	1200	Manhole	1 SW COMBINED02	35	1200	Manhole	1 SW COMBINED02
6.000	42	450	Manhole	1 SW COMBINED02	43	450	Manhole	1 SW COMBINED02
6.001	43	450	Manhole	1 SW COMBINED02	44	450	Manhole	1 SW COMBINED02
6.002	44	450	Manhole	1 SW COMBINED02	45	450	Manhole	1 SW COMBINED02
6.003	45	450	Manhole	1 SW COMBINED02	35	1200	Manhole	1 SW COMBINED02
4.011	35	1200	Manhole	1 SW COMBINED02	36	1200	Manhole	1 SW COMBINED02
4.012	36	1200	Manhole	1 SW COMBINED02	37	1200	Manhole	1 SW COMBINED02
4.013	37	1200	Manhole	1 SW COMBINED02	9	1200	Manhole	1 SW COMBINED02
1.008	9	1200	Manhole	1 SW COMBINED02	10	1200	Manhole	1 SW COMBINED02

Pipeline Schedule

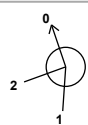
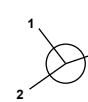
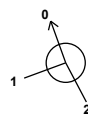
Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.009	78.456	27.8	150	1 SW COMBINED02	138.342	137.144	1.048	135.319	134.322	0.847
1.010	65.111	23.8	150	1 SW COMBINED02	135.319	134.322	0.847	132.585	131.588	0.847
1.011	75.792	38.3	150	1 SW COMBINED02	132.585	131.588	0.847	130.610	129.609	0.851
1.012	15.121	199.0	150	1 SW COMBINED02	130.610	129.609	0.851	130.384	129.533	0.701
7.000	15.643	150.0	150	1 SW COMBINED02	145.856	144.792	0.914	146.038	144.688	1.200
8.000	48.568	26.3	150	1 SW COMBINED02	146.850	145.625	1.075	145.000	143.775	1.075
8.001	45.767	36.6	150	1 SW COMBINED02	145.000	143.775	1.075	143.750	142.525	1.075
8.002	16.916	28.1	150	1 SW COMBINED02	143.750	142.525	1.075	143.147	141.922	1.075
8.003	15.637	30.2	150	1 SW COMBINED02	143.147	141.992	1.005	142.525	141.475	0.900
9.000	39.011	14.6	150	1 SW COMBINED02	146.200	144.975	1.075	143.450	142.306	0.994
9.001	22.621	200.0	150	1 SW COMBINED02	143.450	142.306	0.994	142.874	142.193	0.531

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.009	10	1200	Manhole	1 SW COMBINED02	11	1200	Manhole	1 SW COMBINED02
1.010	11	1200	Manhole	1 SW COMBINED02	12	450	Manhole	1 SW COMBINED02
1.011	12	450	Manhole	1 SW COMBINED02	13	450	Manhole	1 SW COMBINED02
1.012	13	450	Manhole	1 SW COMBINED02	14		Manhole	1 SW COMBINED02
7.000	46	1200	Manhole	1 SW COMBINED02	17	1200	Manhole	1 SW COMBINED02
8.000	47	1200	Junction		48	1200	Junction	
8.001	48	1200	Junction		49	1200	Junction	
8.002	49	1200	Junction		50	1200	Junction	
8.003	50	1200	Junction		30	450	Manhole	1 SW COMBINED02
9.000	51		Junction		52		Junction	
9.001	52		Junction		6	450	Manhole	1 SW COMBINED02

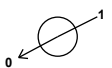
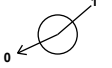
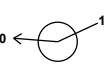
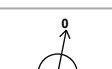
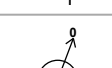
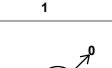
Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)	
1	302711.122	516816.690	147.000	1.000	450		0	1.000	146.000	100
2	302718.986	516833.113	146.135	0.863	450		1	1.000	145.272	100
3	302742.391	516840.716	144.537	0.682	450		0	1.001	145.272	150
						1	1.001	143.905	150	
4	302744.422	516835.044	144.350	0.696	450		0	1.002	143.855	150
						1	1.002	143.654	150	
5	302765.162	516840.455	143.050	0.657	450		1	1.003	142.393	150
						0	1.004	142.393	225	

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)	
6	302776.415	516844.531	142.874	0.681	450		1	9.001	142.193	150
							2	1.004	142.193	225
							0	1.005	142.193	225
15	302702.002	516816.821	147.065	1.400	1200		0	2.000	145.665	100
							1	2.000	145.423	100
16	302697.839	516829.347	146.823	1.450	1200		0	2.001	145.373	150
							1	7.000	144.688	150
17	302715.422	516841.746	146.038	1.350	1200		2	2.001	144.688	150
							0	2.002	144.688	150
							1	2.002	141.230	150
18	302764.113	516858.208	142.580	1.350	1200		0	2.003	141.230	150
							1	2.003	140.538	150
19	302780.221	516870.920	141.888	1.350	1200		0	2.004	140.538	150
							1	2.004	140.188	150
20	302778.107	516878.375	141.538	1.350	1200		0	2.005	140.813	100
							1	2.005	140.750	100
7	302765.920	516875.517	141.577	0.877	450		2	1.005	140.766	225
							0	1.006	140.700	225
							21	302668.202	516897.353	143.560
1	3.000	142.562	225							
22	302714.229	516887.001	143.287	0.725	450		0	3.001	142.562	225
							1	3.001	140.885	225
23	302758.067	516879.677	141.610	0.725	450		0	3.002	140.885	225
							1	3.002	140.683	225
8	302762.807	516881.421	141.390	1.116	1200		2	1.006	140.349	225
							0	1.007	140.274	225
							24	302682.051	516835.565	146.512

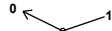
Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
25	302662.422	516830.810	146.118	1.450	450	 1	4.000	144.718	100
						0	4.001	144.668	150
26	302629.113	516803.173	144.672	1.450	450	 1	4.001	143.222	150
						0	4.002	143.222	150
27	302624.191	516809.147	145.047	1.864	1200	 1	4.002	143.183	150
						0	4.003	143.878	100
28	302614.257	516804.163	144.647	1.001	450	 1	4.003	143.646	100
						0	4.004	143.646	100
38	302694.276	516816.455	147.000	0.700	450	 1			
						0	5.000	146.300	150
39	302670.174	516827.838	146.391	0.700	450	 1	5.000	145.691	150
						0	5.001	145.691	150
40	302643.839	516805.190	145.761	0.700	450	 1	5.001	145.061	150
						0	5.002	145.061	225
41	302619.998	516794.102	145.030	0.700	450	 1	5.002	144.330	225
						0	5.003	144.330	225
29	302598.614	516795.797	143.925	1.050	450	 1, 2	5.003, 4.004	142.875, 142.925	225, 100
						0	4.005	142.875	225
30	302573.732	516786.689	142.525	1.125	450	 1, 2	8.003, 4.005	141.475, 141.475	150, 225
						0	4.006	141.400	225
31	302570.406	516797.993	142.127	1.133	450	 1	4.006	140.994	225
						0	4.007	140.994	225
32	302573.737	516814.798	142.068	1.784	1200	 1	4.007	140.359	225
						0	4.008	140.284	300
33	302580.173	516831.846	142.100	1.907	1200	 1	4.008	140.193	300
						0	4.009	140.193	300

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
34	302596.868	516848.309	142.538	2.462	1200		1 4.009	140.076	300
42	302664.012	516853.709	145.820	0.600	450		0 4.010	140.076	300
43	302655.938	516836.851	145.787	0.749	450		1 6.000	145.220	150
44	302626.462	516850.883	143.807	0.650	450		1 6.000	145.038	150
45	302623.109	516866.433	143.045	0.650	450		0 6.001	145.039	150
35	302611.538	516864.692	142.618	2.652	1200		1 6.001	143.207	150
36	302605.982	516884.602	141.344	1.809	1200		0 6.002	143.157	225
37	302675.011	516918.194	141.345	2.193	1200		1 6.002	142.395	225
9	302744.417	516932.463	139.094	1.807	1200		0 6.003	142.395	225
10	302740.393	516966.535	138.342	1.801	1200		1 6.003	141.664	225
11	302669.446	517000.030	135.319	0.997	1200		2 4.010	139.966	300
12	302605.418	517011.858	132.585	0.997	450		0 4.011	139.966	300
13	302545.156	517057.825	130.610	1.001	450		1 4.011	139.535	300
							0 4.012	139.536	300
							1 4.012	139.152	300
							0 4.013	139.152	300
							1 4.013	137.287	300
							2 1.007	137.363	225
							0 1.008	137.287	300
							1 1.008	136.541	300
							0 1.009	137.144	150
							1 1.009	134.322	150
							0 1.010	134.322	150
							1 1.010	131.588	150
							0 1.011	131.588	150
							1 1.011	129.609	150
							0 1.012	129.609	150

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
14	302552.508	517071.039	130.384	0.851		 1	1.012	129.533	150
46	302705.910	516854.165	145.856	1.064	1200	 0	7.000	144.792	150
47	302685.409	516795.643	146.850	1.225	1200	 0	8.000	145.625	150
48	302639.418	516780.033	145.000	1.225	1200	 1	8.000	143.775	150
49	302596.079	516765.323	143.750	1.225	1200	 1	8.001	142.525	150
50	302580.902	516772.793	143.147	1.225	1200	 1	8.002	141.922	150
51	302737.768	516809.930	146.200	1.225		 0	9.000	144.975	150
52	302774.877	516821.962	143.450	1.144		 1	9.000	142.306	150
						 0	9.001	142.306	150

Simulation Settings

Rainfall Methodology	FEH-22	Skip Steady State	x	Check Discharge Rate(s)	x
Summer CV	0.750	Drain Down Time (mins)	240	Check Discharge Volume	x
Analysis Speed	Normal	Additional Storage (m³/ha)	20.0		

Storm Durations

15 | 30 | 60 | 120 | 180 | 240 | 360 | 480 | 600 | 720 | 960 | 1440

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
2	0	0	0
30	40	0	0
100	40	0	0
100	50	0	0

Node 10 Online Orifice Control

Flap Valve	x	Design Depth (m)	1.200	Discharge Coefficient	0.600
Replaces Downstream Link	✓	Design Flow (l/s)	12.2		
Invert Level (m)	137.144	Diameter (m)	0.073		

Node 37 Online Orifice Control

Flap Valve	x	Invert Level (m)	139.152	Discharge Coefficient	0.600
Replaces Downstream Link	✓	Diameter (m)	0.100		

Node 19 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.37580	Safety Factor	2.0	Invert Level (m)	139.480
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.30	Time to half empty (mins)	80

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	66.0	66.0	1.800	66.0	72.8	1.801	0.0	72.8

Node 10 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.25760	Safety Factor	2.0	Invert Level (m)	136.541
Side Inf Coefficient (m/hr)	0.25760	Porosity	0.30	Time to half empty (mins)	104

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	325.0	325.0	1.400	325.0	431.4	1.401	0.0	431.4

Node 27 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.72120	Safety Factor	2.0	Invert Level (m)	143.183
Side Inf Coefficient (m/hr)	0.72120	Porosity	0.30	Time to half empty (mins)	25

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	45.0	45.0	1.000	45.0	73.0	1.001	0.0	73.0

Node 31 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.14870	Safety Factor	2.0	Invert Level (m)	140.994
Side Inf Coefficient (m/hr)	0.14870	Porosity	0.30	Time to half empty (mins)	4

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	20.6	20.6	1.000	20.6	57.2	1.001	0.0	57.2

Node 32 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.14870	Safety Factor	2.0	Invert Level (m)	140.284
Side Inf Coefficient (m/hr)	0.14870	Porosity	0.30	Time to half empty (mins)	16

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	21.9	21.9	1.000	21.9	60.7	1.001	0.0	60.7

Node 33 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.14870	Safety Factor	2.0	Invert Level (m)	140.193
Side Inf Coefficient (m/hr)	0.14870	Porosity	0.30	Time to half empty (mins)	19

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	28.1	28.1	1.000	28.1	77.4	1.001	0.0	77.4

Node 34 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.25760	Safety Factor	2.0	Invert Level (m)	140.076
Side Inf Coefficient (m/hr)	0.25760	Porosity	0.30	Time to half empty (mins)	22

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	26.4	26.4	1.000	26.4	72.8	1.001	0.0	72.8

Node 35 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.25760	Safety Factor	2.0	Invert Level (m)	139.966
Side Inf Coefficient (m/hr)	0.25760	Porosity	0.30	Time to half empty (mins)	26

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	24.8	24.8	1.000	24.8	68.5	1.001	0.0	68.5

Node 36 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.25760	Safety Factor	2.0	Invert Level (m)	139.535
Side Inf Coefficient (m/hr)	0.25760	Porosity	0.30	Time to half empty (mins)	42

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	135.0	135.0	1.000	135.0	288.6	1.001	0.0	288.6

Node 37 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.25760	Safety Factor	2.0	Invert Level (m)	139.152
Side Inf Coefficient (m/hr)	0.25760	Porosity	0.30	Time to half empty (mins)	61

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	85.0	85.0	1.000	85.0	229.1	1.001	0.0	229.1

Node 47 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.14870	Safety Factor	2.0	Invert Level (m)	145.625
Side Inf Coefficient (m/hr)	0.14870	Porosity	0.30	Time to half empty (mins)	0

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	58.0	58.0	1.000	58.0	158.4	1.001	0.0	158.4

Node 48 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.14870	Safety Factor	2.0	Invert Level (m)	143.775
Side Inf Coefficient (m/hr)	0.14870	Porosity	0.30	Time to half empty (mins)	0

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	55.0	55.0	1.000	55.0	149.2	1.001	0.0	149.2

Node 49 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.14870	Safety Factor	2.0	Invert Level (m)	142.525
Side Inf Coefficient (m/hr)	0.14870	Porosity	0.30	Time to half empty (mins)	0

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	20.0	20.0	1.000	20.0	56.5	1.001	0.0	56.5

Node 50 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.14870	Safety Factor	2.0	Invert Level (m)	141.922
Side Inf Coefficient (m/hr)	0.14870	Porosity	0.30	Time to half empty (mins)	0

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	18.7	18.7	1.000	18.7	58.5	1.001	0.0	58.5

Node 51 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.14870	Safety Factor	2.0	Invert Level (m)	144.975
Side Inf Coefficient (m/hr)	0.14870	Porosity	0.30	Time to half empty (mins)	0

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	46.8	46.8	1.000	46.8	127.2	1.001	0.0	127.2

Node 52 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.14870	Safety Factor	2.0	Invert Level (m)	142.306
Side Inf Coefficient (m/hr)	0.14870	Porosity	0.30	Time to half empty (mins)	0

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	27.1	27.1	1.000	27.1	74.7	1.001	0.0	74.7

Results for 2 year Critical Storm Duration. Lowest mass balance: 98.75%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	1	10	146.037	0.037	3.6	0.0267	0.0000	OK
15 minute summer	2	10	145.314	0.042	7.1	0.0330	0.0000	OK
15 minute summer	3	10	143.905	0.050	6.9	0.0079	0.0000	OK
15 minute summer	4	10	143.707	0.053	11.5	0.0628	0.0000	OK
15 minute summer	5	10	142.466	0.073	13.2	0.0426	0.0000	OK
15 minute summer	6	11	142.250	0.057	15.2	0.0091	0.0000	OK
15 minute summer	15	10	145.720	0.055	4.5	0.0889	0.0000	OK
15 minute summer	16	10	145.423	0.049	7.3	0.0717	0.0000	OK
15 minute summer	17	11	144.740	0.052	11.9	0.0692	0.0000	OK
15 minute summer	18	11	141.295	0.065	11.9	0.0730	0.0000	OK
60 minute summer	19	41	139.653	-0.885	8.9	3.4246	0.0000	OK
15 minute summer	20	1	140.188	0.000	0.0	0.0000	0.0000	OK
15 minute summer	7	11	140.764	0.064	17.7	0.0423	0.0000	OK
15 minute summer	21	10	142.920	0.085	11.4	0.2217	0.0000	OK
15 minute summer	22	11	142.629	0.067	19.8	0.1358	0.0000	OK
15 minute summer	23	11	140.960	0.075	19.6	0.0120	0.0000	OK
15 minute summer	8	11	140.361	0.087	37.3	0.0982	0.0000	OK
15 minute summer	24	10	145.156	0.044	3.3	0.0233	0.0000	OK
15 minute summer	25	10	144.721	0.053	8.9	0.0407	0.0000	OK
15 minute summer	26	11	143.313	0.091	8.8	0.0145	0.0000	OK
30 minute summer	27	22	143.281	0.098	8.2	1.4379	0.0000	OK
15 minute summer	28	1	143.646	0.000	0.0	0.0000	0.0000	OK
15 minute summer	38	10	146.345	0.044	5.2	0.0591	0.0000	OK
Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	1	1.000	2	3.6	1.236	0.293	0.0526	
15 minute summer	2	1.001	3	6.9	1.744	0.165	0.0981	
15 minute summer	3	1.002	4	6.9	1.303	0.212	0.0320	
15 minute summer	4	1.003	5	11.4	1.637	0.263	0.1499	
15 minute summer	5	1.004	6	13.2	1.413	0.196	0.1137	
15 minute summer	6	1.005	7	15.0	1.913	0.138	0.2566	
15 minute summer	15	2.000	16	4.4	1.039	0.538	0.0561	
15 minute summer	16	2.001	17	7.3	1.397	0.228	0.1118	
15 minute summer	17	2.002	18	11.9	1.908	0.255	0.3246	
15 minute summer	18	2.003	19	11.8	1.672	0.361	0.1454	
60 minute summer	19	2.004	20	0.0	0.000	0.000	0.0000	
60 minute summer	19	Infiltration		3.4				
15 minute summer	20	2.005	7	0.0	0.000	0.000	0.0042	
15 minute summer	7	1.006	8	17.7	2.031	0.147	0.0581	
15 minute summer	21	3.000	22	11.1	0.952	0.282	0.5528	
15 minute summer	22	3.001	23	19.6	1.837	0.193	0.4775	
15 minute summer	23	3.002	8	19.7	1.847	0.188	0.0538	
15 minute summer	8	1.007	9	37.0	2.660	0.306	0.7546	
15 minute summer	24	4.000	25	3.3	0.995	0.384	0.0660	
15 minute summer	25	4.001	26	8.8	1.063	0.269	0.3631	
15 minute summer	26	4.002	27	8.6	1.122	0.688	0.0818	
30 minute summer	27	4.003	28	0.0	0.000	0.000	0.0000	
30 minute summer	27	Infiltration		4.7				
15 minute summer	28	4.004	29	0.0	0.000	0.000	0.0065	
15 minute summer	38	5.000	39	5.2	0.873	0.191	0.1581	

Results for 2 year Critical Storm Duration. Lowest mass balance: 98.75%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	39	10	145.757	0.066	9.3	0.0711	0.0000	OK
15 minute summer	40	11	145.121	0.059	12.4	0.0536	0.0000	OK
15 minute summer	41	11	144.382	0.052	16.2	0.0546	0.0000	OK
15 minute summer	29	11	142.940	0.065	20.7	0.0561	0.0000	OK
30 minute summer	30	19	141.480	0.079	23.2	0.0126	0.0000	OK
30 minute summer	31	19	141.073	0.079	25.1	0.5286	0.0000	OK
30 minute summer	32	19	140.421	0.137	30.6	1.1427	0.0000	OK
30 minute summer	33	20	140.334	0.141	33.1	1.3954	0.0000	OK
30 minute summer	34	20	140.214	0.138	33.4	1.2699	0.0000	OK
15 minute summer	42	10	145.274	0.053	4.7	0.0744	0.0000	OK
15 minute summer	43	10	145.098	0.060	13.3	0.1177	0.0000	OK
15 minute summer	44	10	143.230	0.073	23.5	0.1925	0.0000	OK
15 minute summer	45	10	142.463	0.068	23.4	0.0109	0.0000	OK
15 minute summer	35	12	140.088	0.122	50.8	1.0437	0.0000	OK
30 minute summer	36	21	139.688	0.153	49.9	6.3820	0.0000	OK
60 minute summer	37	44	139.494	0.342	34.6	9.1154	0.0000	SURCHARGED
15 minute summer	9	11	137.400	0.112	37.3	0.1272	0.0000	OK
120 minute summer	10	90	136.755	0.214	28.8	21.1329	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	39	5.001	40	9.1	1.301	0.379	0.2425	
15 minute summer	40	5.002	41	12.4	1.613	0.142	0.2018	
15 minute summer	41	5.003	29	16.2	1.977	0.119	0.1765	
15 minute summer	29	4.005	30	20.8	2.240	0.173	0.2462	
30 minute summer	30	4.006	31	23.1	1.850	0.239	0.1474	
30 minute summer	31	4.007	32	24.4	2.026	0.243	0.2066	
30 minute summer	31	Infiltration		0.4				
30 minute summer	32	4.008	33	29.4	0.935	0.375	0.5787	
30 minute summer	32	Infiltration		0.5				
30 minute summer	33	4.009	34	32.0	0.997	0.409	0.7521	
30 minute summer	33	Infiltration		0.7				
30 minute summer	34	4.010	35	31.7	1.148	0.404	0.6314	
30 minute summer	34	Infiltration		1.1				
15 minute summer	42	6.000	43	4.6	0.765	0.265	0.1135	
15 minute summer	43	6.001	44	13.1	2.089	0.309	0.2049	
15 minute summer	44	6.002	45	23.4	2.203	0.204	0.1687	
15 minute summer	45	6.003	35	23.2	2.393	0.177	0.1135	
15 minute summer	35	4.011	36	50.2	2.153	0.312	0.5986	
15 minute summer	35	Infiltration		1.0				
30 minute summer	36	4.012	37	40.8	1.274	0.521	3.7096	
30 minute summer	36	Infiltration		5.4				
60 minute summer	37	Orifice	9	11.3				
60 minute summer	37	Infiltration		4.6				
15 minute summer	9	1.008	10	37.9	2.572	0.231	0.5946	
120 minute summer	10	Orifice	11	0.0				

Results for 2 year Critical Storm Duration. Lowest mass balance: 98.75%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	11	1	134.322	0.000	0.0	0.0000	0.0000	OK
15 minute summer	12	1	131.588	0.000	0.0	0.0000	0.0000	OK
15 minute summer	13	1	129.609	0.000	0.0	0.0000	0.0000	OK
15 minute summer	14	1	129.533	0.000	0.0	0.0000	0.0000	OK
15 minute summer	46	10	144.838	0.046	2.9	0.0719	0.0000	OK
15 minute summer	47	11	145.660	0.035	5.5	0.6269	0.0000	OK
30 minute summer	48	20	143.816	0.041	6.0	0.6867	0.0000	OK
30 minute summer	49	21	142.560	0.035	4.5	0.2124	0.0000	OK
30 minute summer	50	21	142.032	0.110	5.5	0.6474	0.0000	OK
15 minute summer	51	11	145.000	0.025	3.5	0.3550	0.0000	OK
30 minute summer	52	20	142.352	0.046	3.5	0.3785	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
120 minute summer	10	Infiltration		12.1				
15 minute summer	11	1.010	12	0.0	0.000	0.000	0.0000	
15 minute summer	12	1.011	13	0.0	0.000	0.000	0.0000	
15 minute summer	13	1.012	14	0.0	0.000	0.000	0.0000	0.0
15 minute summer	46	7.000	17	2.9	0.579	0.198	0.0775	
15 minute summer	47	8.000	48	4.1	1.298	0.116	0.1667	
15 minute summer	47	Infiltration		0.8				
30 minute summer	48	8.001	49	4.5	1.314	0.154	0.1601	
30 minute summer	48	Infiltration		0.9				
30 minute summer	49	8.002	50	4.1	0.486	0.122	0.1438	
30 minute summer	49	Infiltration		0.3				
30 minute summer	50	8.003	30	4.9	1.318	0.151	0.0583	
30 minute summer	50	Infiltration		0.4				
15 minute summer	51	9.000	52	2.7	1.142	0.058	0.1206	
15 minute summer	51	Infiltration		0.5				
30 minute summer	52	9.001	6	2.5	0.512	0.204	0.1181	
30 minute summer	52	Infiltration		0.5				

Results for 30 year +40% CC Critical Storm Duration. Lowest mass balance: 98.75%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	1	10	146.071	0.071	10.0	0.0512	0.0000	OK
15 minute summer	2	10	145.346	0.074	19.6	0.0583	0.0000	OK
15 minute summer	3	10	143.950	0.095	19.4	0.0152	0.0000	OK
15 minute summer	4	10	143.750	0.096	32.3	0.1147	0.0000	OK
15 minute summer	5	10	142.526	0.133	37.1	0.0776	0.0000	OK
15 minute summer	6	11	142.298	0.105	45.4	0.0167	0.0000	OK
15 minute summer	15	11	146.002	0.337	12.5	0.5503	0.0000	SURCHARGED
15 minute summer	16	11	145.458	0.085	18.6	0.1228	0.0000	OK
15 minute summer	17	11	144.779	0.090	31.3	0.1210	0.0000	OK
15 minute summer	18	11	141.359	0.128	31.4	0.1453	0.0000	OK
120 minute summer	19	88	140.358	-0.180	17.8	17.3844	0.0000	OK
15 minute summer	20	13	140.198	0.010	0.1	0.0112	0.0000	OK
15 minute summer	7	11	140.824	0.124	52.9	0.0822	0.0000	OK
15 minute summer	21	10	142.992	0.157	31.8	0.4112	0.0000	OK
15 minute summer	22	11	142.679	0.117	55.4	0.2380	0.0000	OK
15 minute summer	23	11	141.031	0.145	54.7	0.0231	0.0000	OK
15 minute summer	8	11	140.447	0.173	107.8	0.1956	0.0000	OK
15 minute summer	24	11	145.244	0.132	9.3	0.0701	0.0000	SURCHARGED
15 minute summer	25	10	144.764	0.096	24.3	0.0737	0.0000	OK
60 minute summer	26	41	143.702	0.480	19.4	0.0764	0.0000	SURCHARGED
60 minute summer	27	42	143.689	0.506	17.4	7.4060	0.0000	OK
15 minute summer	28	1	143.646	0.000	0.0	0.0000	0.0000	OK
15 minute summer	38	10	146.379	0.079	14.7	0.1045	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	1	1.000	2	9.9	1.628	0.816	0.1110	
15 minute summer	2	1.001	3	19.4	2.289	0.461	0.2091	
15 minute summer	3	1.002	4	19.4	1.635	0.594	0.0715	
15 minute summer	4	1.003	5	32.1	2.227	0.740	0.3043	
15 minute summer	5	1.004	6	36.9	1.764	0.548	0.2523	
15 minute summer	6	1.005	7	45.4	2.572	0.416	0.5776	
15 minute summer	15	2.000	16	10.8	1.385	1.320	0.1022	
15 minute summer	16	2.001	17	18.6	1.741	0.584	0.2299	
15 minute summer	17	2.002	18	31.4	2.343	0.677	0.6980	
15 minute summer	18	2.003	19	31.0	2.026	0.946	0.3151	
120 minute summer	19	2.004	20	0.0	0.000	0.000	0.0000	
120 minute summer	19	Infiltration		3.4				
15 minute summer	20	2.005	7	-0.1	-0.038	-0.028	0.0418	
15 minute summer	7	1.006	8	52.8	2.612	0.440	0.1349	
15 minute summer	21	3.000	22	31.1	1.236	0.790	1.1904	
15 minute summer	22	3.001	23	54.7	2.295	0.539	1.0664	
15 minute summer	23	3.002	8	55.0	2.307	0.527	0.1203	
15 minute summer	8	1.007	9	107.6	3.377	0.889	1.7277	
15 minute summer	24	4.000	25	8.6	1.159	1.012	0.1546	
15 minute summer	25	4.001	26	24.2	1.489	0.743	0.6393	
60 minute summer	26	4.002	27	17.4	0.991	1.391	0.1363	
60 minute summer	27	4.003	28	0.0	0.000	0.000	0.0000	
60 minute summer	27	Infiltration		5.9				
15 minute summer	28	4.004	29	0.0	0.000	0.000	0.0475	
15 minute summer	38	5.000	39	14.6	1.077	0.541	0.3591	

Results for 30 year +40% CC Critical Storm Duration. Lowest mass balance: 98.75%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	39	11	145.904	0.213	26.0	0.2287	0.0000	SURCHARGED
15 minute summer	40	10	145.163	0.102	32.3	0.0916	0.0000	OK
15 minute summer	41	10	144.418	0.088	44.2	0.0916	0.0000	OK
15 minute summer	29	10	142.990	0.115	57.3	0.0991	0.0000	OK
30 minute summer	30	18	141.570	0.170	74.0	0.0271	0.0000	OK
30 minute summer	31	20	141.176	0.182	79.9	1.2131	0.0000	OK
30 minute summer	32	21	140.787	0.503	95.5	4.1952	0.0000	SURCHARGED
30 minute summer	33	21	140.664	0.471	96.2	4.6759	0.0000	SURCHARGED
30 minute summer	34	22	140.511	0.435	91.4	3.9967	0.0000	SURCHARGED
15 minute summer	42	10	145.322	0.102	13.2	0.1417	0.0000	OK
15 minute summer	43	10	145.153	0.115	37.3	0.2269	0.0000	OK
15 minute summer	44	10	143.291	0.134	65.7	0.3540	0.0000	OK
15 minute summer	45	10	142.521	0.126	65.4	0.0201	0.0000	OK
60 minute summer	35	43	140.405	0.439	128.9	3.7658	0.0000	SURCHARGED
60 minute summer	36	44	140.365	0.830	123.8	34.5950	0.0000	SURCHARGED
60 minute summer	37	41	140.312	1.160	63.8	26.8251	0.0000	SURCHARGED
240 minute summer	9	176	137.530	0.243	54.3	0.2749	0.0000	OK
240 minute summer	10	180	137.519	0.978	54.3	96.4468	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	39	5.001	40	23.3	1.660	0.971	0.5261	
15 minute summer	40	5.002	41	33.1	2.089	0.380	0.4164	
15 minute summer	41	5.003	29	44.1	2.551	0.324	0.3714	
15 minute summer	29	4.005	30	56.8	2.896	0.472	0.5194	
30 minute summer	30	4.006	31	73.7	2.333	0.760	0.3896	
30 minute summer	31	4.007	32	76.9	2.185	0.765	0.6359	
30 minute summer	31	Infiltration		0.5				
30 minute summer	32	4.008	33	85.6	1.216	1.094	1.2832	
30 minute summer	32	Infiltration		0.8				
30 minute summer	33	4.009	34	86.4	1.227	1.104	1.6511	
30 minute summer	33	Infiltration		1.0				
30 minute summer	34	4.010	35	81.6	1.201	1.042	1.5487	
30 minute summer	34	Infiltration		1.6				
15 minute summer	42	6.000	43	13.1	0.959	0.746	0.2542	
15 minute summer	43	6.001	44	36.7	2.634	0.867	0.4557	
15 minute summer	44	6.002	45	65.4	2.753	0.572	0.3778	
15 minute summer	45	6.003	35	65.0	3.056	0.497	0.2491	
60 minute summer	35	4.011	36	122.7	1.968	0.763	1.4556	
60 minute summer	35	Infiltration		1.5				
60 minute summer	36	4.012	37	63.8	0.945	0.814	5.4060	
60 minute summer	36	Infiltration		9.3				
60 minute summer	37	Orifice	9	22.0				
60 minute summer	37	Infiltration		8.2				
240 minute summer	9	1.008	10	54.3	1.664	0.331	2.2570	
240 minute summer	10	Orifice	11	6.5				

Results for 30 year +40% CC Critical Storm Duration. Lowest mass balance: 98.75%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
240 minute summer	11	180	134.365	0.043	6.5	0.0483	0.0000	OK
240 minute summer	12	180	131.636	0.048	6.5	0.0077	0.0000	OK
240 minute summer	13	180	129.689	0.080	6.5	0.0127	0.0000	OK
240 minute summer	14	180	129.607	0.074	6.5	0.0000	0.0000	OK
15 minute summer	46	10	144.876	0.084	8.2	0.1317	0.0000	OK
15 minute summer	47	11	145.689	0.064	15.4	1.1639	0.0000	OK
15 minute summer	48	12	143.858	0.083	19.4	1.4007	0.0000	OK
30 minute summer	49	20	142.598	0.073	16.8	0.4404	0.0000	OK
30 minute summer	50	20	142.081	0.159	21.1	0.9336	0.0000	OK
15 minute summer	51	11	145.018	0.043	9.7	0.6263	0.0000	OK
15 minute summer	52	12	142.404	0.098	11.2	0.8069	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
240 minute summer	10	Infiltration		14.2				
240 minute summer	11	1.010	12	6.5	1.435	0.177	0.2939	
240 minute summer	12	1.011	13	6.5	0.969	0.225	0.5460	
240 minute summer	13	1.012	14	6.5	0.715	0.517	0.1369	33.1
15 minute summer	46	7.000	17	8.1	0.767	0.559	0.1648	
15 minute summer	47	8.000	48	13.3	1.643	0.382	0.4138	
15 minute summer	47	Infiltration		1.2				
15 minute summer	48	8.001	49	17.0	1.835	0.577	0.4257	
15 minute summer	48	Infiltration		1.2				
30 minute summer	49	8.002	50	16.2	1.112	0.482	0.2213	
30 minute summer	49	Infiltration		0.4				
30 minute summer	50	8.003	30	20.2	1.903	0.621	0.1720	
30 minute summer	50	Infiltration		0.5				
15 minute summer	51	9.000	52	8.5	1.295	0.181	0.3131	
15 minute summer	51	Infiltration		0.8				
15 minute summer	52	9.001	6	9.3	0.786	0.742	0.2800	
15 minute summer	52	Infiltration		0.6				

Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 98.75%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	1	10	146.090	0.090	12.4	0.0649	0.0000	OK
15 minute summer	2	10	145.357	0.085	24.2	0.0664	0.0000	OK
15 minute summer	3	10	143.968	0.113	24.0	0.0179	0.0000	OK
15 minute summer	4	10	143.769	0.115	39.8	0.1376	0.0000	OK
15 minute summer	5	10	142.546	0.153	45.7	0.0895	0.0000	OK
15 minute summer	6	11	142.313	0.120	56.4	0.0190	0.0000	OK
30 minute summer	15	19	146.228	0.563	15.1	0.9184	0.0000	SURCHARGED
15 minute summer	16	11	145.470	0.096	22.6	0.1397	0.0000	OK
15 minute summer	17	11	144.792	0.104	38.3	0.1392	0.0000	OK
15 minute summer	18	12	141.619	0.389	38.4	0.4404	0.0000	SURCHARGED
120 minute summer	19	94	140.658	0.120	22.3	23.4625	0.0000	OK
120 minute summer	20	92	140.660	0.472	4.6	0.5337	0.0000	OK
15 minute summer	7	12	140.895	0.195	65.7	0.1287	0.0000	OK
15 minute summer	21	10	143.022	0.187	39.5	0.4887	0.0000	OK
15 minute summer	22	11	142.696	0.134	68.6	0.2721	0.0000	OK
15 minute summer	23	11	141.057	0.172	67.9	0.0273	0.0000	OK
15 minute summer	8	12	140.782	0.508	130.8	0.5740	0.0000	SURCHARGED
15 minute summer	24	11	145.457	0.345	11.5	0.1826	0.0000	SURCHARGED
30 minute summer	25	19	144.797	0.129	29.0	0.0988	0.0000	OK
60 minute summer	26	41	143.917	0.695	23.7	0.1105	0.0000	SURCHARGED
60 minute summer	27	42	143.897	0.714	21.5	10.4518	0.0000	OK
60 minute summer	28	43	143.661	0.015	0.6	0.0024	0.0000	OK
15 minute summer	38	11	146.406	0.106	18.2	0.1404	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	1	1.000	2	12.2	1.688	1.000	0.1320	
15 minute summer	2	1.001	3	24.0	2.402	0.568	0.2454	
15 minute summer	3	1.002	4	23.8	1.671	0.731	0.0866	
15 minute summer	4	1.003	5	39.5	2.379	0.911	0.3443	
15 minute summer	5	1.004	6	45.5	1.834	0.675	0.2988	
15 minute summer	6	1.005	7	56.4	2.708	0.517	0.7079	
30 minute summer	15	2.000	16	13.1	1.676	1.598	0.1022	
15 minute summer	16	2.001	17	22.5	1.801	0.707	0.2691	
15 minute summer	17	2.002	18	38.4	2.412	0.827	0.7875	
15 minute summer	18	2.003	19	35.5	2.015	1.082	0.3611	
120 minute summer	19	2.004	20	4.6	0.372	0.122	0.1268	
120 minute summer	19	Infiltration		3.4				
120 minute summer	20	2.005	7	0.0	0.000	0.000	0.0233	
15 minute summer	7	1.006	8	62.6	2.591	0.522	0.2547	
15 minute summer	21	3.000	22	38.6	1.282	0.978	1.4108	
15 minute summer	22	3.001	23	67.9	2.385	0.669	1.2695	
15 minute summer	23	3.002	8	68.2	2.395	0.653	0.1431	
15 minute summer	8	1.007	9	125.4	3.320	1.036	2.1577	
15 minute summer	24	4.000	25	10.3	1.314	1.214	0.1564	
30 minute summer	25	4.001	26	28.4	1.633	0.871	0.7298	
60 minute summer	26	4.002	27	21.5	1.219	1.712	0.1363	
60 minute summer	27	4.003	28	0.6	0.764	0.071	0.0096	
60 minute summer	27	Infiltration		6.5				
60 minute summer	28	4.004	29	0.6	0.805	0.049	0.0468	
15 minute summer	38	5.000	39	17.4	1.111	0.646	0.4112	

Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 98.75%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	39	12	146.184	0.493	31.6	0.5285	0.0000	FLOOD RISK
15 minute summer	40	11	145.172	0.111	38.3	0.1000	0.0000	OK
15 minute summer	41	11	144.426	0.096	51.3	0.1004	0.0000	OK
15 minute summer	29	10	143.001	0.126	66.8	0.1086	0.0000	OK
30 minute summer	30	20	141.886	0.486	90.9	0.0772	0.0000	SURCHARGED
30 minute summer	31	21	141.517	0.523	91.5	3.4806	0.0000	SURCHARGED
30 minute summer	32	22	141.044	0.760	106.3	6.3352	0.0000	SURCHARGED
60 minute summer	33	43	140.982	0.789	95.8	7.8293	0.0000	SURCHARGED
60 minute summer	34	43	140.957	0.881	86.8	8.0854	0.0000	SURCHARGED
15 minute summer	42	12	145.424	0.204	16.4	0.2836	0.0000	SURCHARGED
15 minute summer	43	12	145.282	0.244	46.5	0.4823	0.0000	SURCHARGED
30 minute summer	44	17	143.308	0.151	78.3	0.4010	0.0000	OK
15 minute summer	45	10	142.540	0.145	78.3	0.0230	0.0000	OK
60 minute summer	35	43	140.934	0.968	141.5	8.2962	0.0000	SURCHARGED
60 minute summer	36	43	140.889	1.354	128.5	42.1108	0.0000	SURCHARGED
60 minute summer	37	43	140.805	1.653	60.6	27.3818	0.0000	SURCHARGED
240 minute summer	9	180	137.839	0.552	66.0	0.6240	0.0000	SURCHARGED
240 minute summer	10	184	137.819	1.278	65.5	126.0187	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	39	5.001	40	27.6	1.640	1.152	0.5480	
15 minute summer	40	5.002	41	38.2	2.151	0.439	0.4682	
15 minute summer	41	5.003	29	51.1	2.721	0.375	0.4129	
15 minute summer	29	4.005	30	67.1	2.982	0.558	0.8104	
30 minute summer	30	4.006	31	84.4	2.345	0.871	0.4686	
30 minute summer	31	4.007	32	81.7	2.184	0.813	0.6814	
30 minute summer	31	Infiltration		0.8				
30 minute summer	32	4.008	33	87.4	1.241	1.116	1.2832	
30 minute summer	32	Infiltration		1.1				
60 minute summer	33	4.009	34	81.2	1.165	1.037	1.6511	
60 minute summer	33	Infiltration		1.4				
60 minute summer	34	4.010	35	77.9	1.200	0.994	1.5487	
60 minute summer	34	Infiltration		2.4				
15 minute summer	42	6.000	43	16.3	0.979	0.929	0.3291	
15 minute summer	43	6.001	44	42.9	2.540	1.014	0.5548	
30 minute summer	44	6.002	45	77.9	2.832	0.681	0.4373	
15 minute summer	45	6.003	35	79.0	3.177	0.604	0.2906	
60 minute summer	35	4.011	36	127.2	1.957	0.791	1.4556	
60 minute summer	35	Infiltration		2.4				
60 minute summer	36	4.012	37	60.6	0.988	0.773	5.4060	
60 minute summer	36	Infiltration		10.3				
60 minute summer	37	Orifice	9	26.4				
60 minute summer	37	Infiltration		8.2				
240 minute summer	9	1.008	10	65.5	1.627	0.399	2.4160	
240 minute summer	10	Orifice	11	8.9				

Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 98.75%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
240 minute summer	11	184	134.372	0.050	8.9	0.0570	0.0000	OK
240 minute summer	12	184	131.645	0.057	8.9	0.0091	0.0000	OK
240 minute summer	13	184	129.707	0.098	8.9	0.0156	0.0000	OK
240 minute summer	14	184	129.620	0.087	8.9	0.0000	0.0000	OK
15 minute summer	46	10	144.890	0.098	10.2	0.1529	0.0000	OK
15 minute summer	47	11	145.699	0.074	19.1	1.3318	0.0000	OK
30 minute summer	48	19	143.874	0.099	24.4	1.6589	0.0000	OK
30 minute summer	49	20	142.611	0.086	21.9	0.5183	0.0000	OK
30 minute summer	50	21	142.169	0.247	27.5	1.4548	0.0000	SURCHARGED
15 minute summer	51	11	145.024	0.049	12.0	0.7042	0.0000	OK
30 minute summer	52	19	142.426	0.120	14.0	0.9899	0.0000	OK
Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
240 minute summer	10	Infiltration		15.1				
240 minute summer	11	1.010	12	8.9	1.568	0.243	0.3694	
240 minute summer	12	1.011	13	8.9	0.967	0.308	0.6956	
240 minute summer	13	1.012	14	8.9	0.780	0.710	0.1722	62.6
15 minute summer	46	7.000	17	10.0	0.807	0.695	0.1949	
15 minute summer	47	8.000	48	16.9	1.707	0.484	0.4997	
15 minute summer	47	Infiltration		1.2				
30 minute summer	48	8.001	49	21.9	1.934	0.743	0.5180	
30 minute summer	48	Infiltration		1.2				
30 minute summer	49	8.002	50	21.3	1.349	0.631	0.2377	
30 minute summer	49	Infiltration		0.4				
30 minute summer	50	8.003	30	24.9	1.709	0.767	0.2753	
30 minute summer	50	Infiltration		0.6				
15 minute summer	51	9.000	52	10.6	1.321	0.227	0.3808	
15 minute summer	51	Infiltration		0.9				
30 minute summer	52	9.001	6	11.8	0.834	0.946	0.3394	
30 minute summer	52	Infiltration		0.6				

Results for 100 year +50% CC Critical Storm Duration. Lowest mass balance: 98.75%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	1	11	146.202	0.202	13.3	0.1449	0.0000	SURCHARGED
30 minute summer	2	17	145.358	0.086	24.6	0.0674	0.0000	OK
30 minute summer	3	17	143.970	0.115	24.5	0.0183	0.0000	OK
15 minute summer	4	10	143.775	0.121	41.3	0.1443	0.0000	OK
15 minute summer	5	10	142.551	0.158	47.9	0.0926	0.0000	OK
30 minute summer	6	18	142.316	0.123	59.0	0.0195	0.0000	OK
30 minute summer	15	19	146.313	0.647	16.2	1.0560	0.0000	SURCHARGED
15 minute summer	16	11	145.474	0.101	24.0	0.1459	0.0000	OK
15 minute summer	17	11	144.797	0.109	40.8	0.1462	0.0000	OK
30 minute summer	18	20	141.738	0.507	40.7	0.5740	0.0000	SURCHARGED
180 minute summer	19	132	140.770	0.232	18.5	25.8086	0.0000	SURCHARGED
180 minute summer	20	132	140.770	0.582	2.9	0.6580	0.0000	OK
15 minute summer	7	12	141.080	0.380	70.6	0.2514	0.0000	SURCHARGED
15 minute summer	21	11	143.036	0.200	42.3	0.5241	0.0000	OK
15 minute summer	22	11	142.702	0.140	73.2	0.2843	0.0000	OK
15 minute summer	23	12	141.074	0.189	72.6	0.0300	0.0000	OK
15 minute summer	8	12	140.942	0.668	137.0	0.7553	0.0000	SURCHARGED
30 minute summer	24	20	145.633	0.521	12.0	0.2763	0.0000	SURCHARGED
30 minute summer	25	19	145.027	0.359	30.1	0.2747	0.0000	SURCHARGED
30 minute summer	26	22	144.000	0.778	28.9	0.1237	0.0000	SURCHARGED
60 minute summer	27	40	143.932	0.749	22.9	10.9530	0.0000	OK
60 minute summer	28	40	143.688	0.042	4.4	0.0066	0.0000	OK
15 minute summer	38	12	146.521	0.221	19.5	0.2937	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	1	1.000	2	12.1	1.676	0.994	0.1361	
30 minute summer	2	1.001	3	24.5	2.415	0.581	0.2498	
30 minute summer	3	1.002	4	24.3	1.691	0.746	0.0888	
15 minute summer	4	1.003	5	41.2	2.412	0.949	0.3516	
15 minute summer	5	1.004	6	47.9	1.857	0.711	0.3088	
30 minute summer	6	1.005	7	58.7	2.732	0.538	0.9898	
30 minute summer	15	2.000	16	13.9	1.773	1.690	0.1022	
15 minute summer	16	2.001	17	23.9	1.817	0.751	0.2833	
15 minute summer	17	2.002	18	40.9	2.425	0.880	0.8058	
30 minute summer	18	2.003	19	37.7	2.140	1.149	0.3612	
180 minute summer	19	2.004	20	2.9	0.241	0.076	0.1364	
180 minute summer	19	Infiltration		3.4				
180 minute summer	20	2.005	7	0.0	0.000	0.000	0.0165	
15 minute summer	7	1.006	8	65.8	2.629	0.549	0.2655	
15 minute summer	21	3.000	22	41.4	1.292	1.049	1.4926	
15 minute summer	22	3.001	23	72.6	2.409	0.715	1.3400	
15 minute summer	23	3.002	8	72.7	2.405	0.696	0.1904	
15 minute summer	8	1.007	9	123.8	3.522	1.023	2.1577	
30 minute summer	24	4.000	25	9.9	1.269	1.172	0.1580	
30 minute summer	25	4.001	26	28.9	1.661	0.884	0.7620	
30 minute summer	26	4.002	27	25.9	1.472	2.066	0.1363	
60 minute summer	27	4.003	28	4.4	1.185	0.497	0.0408	
60 minute summer	27	Infiltration		6.6				
60 minute summer	28	4.004	29	4.2	1.398	0.344	0.0536	
15 minute summer	38	5.000	39	18.1	1.132	0.671	0.4693	

Results for 100 year +50% CC Critical Storm Duration. Lowest mass balance: 98.75%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	39	12	146.262	0.571	33.3	0.6127	0.0000	FLOOD RISK
15 minute summer	40	11	145.175	0.114	40.3	0.1030	0.0000	OK
15 minute summer	41	11	144.430	0.100	54.4	0.1041	0.0000	OK
15 minute summer	29	10	143.005	0.130	71.2	0.1121	0.0000	OK
30 minute summer	30	20	141.986	0.586	93.8	0.0932	0.0000	SURCHARGED
30 minute summer	31	21	141.608	0.614	94.4	4.0884	0.0000	SURCHARGED
60 minute summer	32	43	141.367	1.082	101.2	8.4892	0.0000	SURCHARGED
60 minute summer	33	43	141.345	1.152	97.8	10.1479	0.0000	SURCHARGED
60 minute summer	34	43	141.317	1.241	86.8	9.4887	0.0000	SURCHARGED
15 minute summer	42	12	145.576	0.356	17.6	0.4955	0.0000	FLOOD RISK
15 minute summer	43	12	145.414	0.376	46.7	0.7426	0.0000	SURCHARGED
15 minute summer	44	9	143.311	0.154	80.2	0.4090	0.0000	OK
15 minute summer	45	11	142.540	0.145	79.3	0.0230	0.0000	OK
60 minute summer	35	43	141.292	1.326	141.6	8.9435	0.0000	SURCHARGED
60 minute summer	36	43	141.241	1.706	130.0	42.5246	0.0000	FLOOD RISK
60 minute summer	37	43	141.143	1.991	59.1	27.7651	0.0000	FLOOD RISK
240 minute summer	9	184	137.954	0.666	70.0	0.7538	0.0000	SURCHARGED
360 minute summer	10	248	137.931	1.390	58.3	137.1316	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	39	5.001	40	28.7	1.693	1.198	0.5556	
15 minute summer	40	5.002	41	40.3	2.173	0.463	0.4885	
15 minute summer	41	5.003	29	54.4	2.764	0.399	0.4295	
15 minute summer	29	4.005	30	71.2	2.965	0.593	0.8236	
30 minute summer	30	4.006	31	86.3	2.358	0.891	0.4686	
30 minute summer	31	4.007	32	80.4	2.173	0.800	0.6814	
30 minute summer	31	Infiltration		0.9				
60 minute summer	32	4.008	33	85.0	1.207	1.086	1.2832	
60 minute summer	32	Infiltration		1.3				
60 minute summer	33	4.009	34	81.1	1.164	1.037	1.6511	
60 minute summer	33	Infiltration		1.6				
60 minute summer	34	4.010	35	78.5	1.199	1.002	1.5487	
60 minute summer	34	Infiltration		2.6				
15 minute summer	42	6.000	43	16.0	0.986	0.911	0.3291	
15 minute summer	43	6.001	44	43.5	2.570	1.027	0.5747	
15 minute summer	44	6.002	45	79.3	2.842	0.694	0.4439	
15 minute summer	45	6.003	35	78.8	3.172	0.603	0.2904	
60 minute summer	35	4.011	36	128.6	1.946	0.799	1.4556	
60 minute summer	35	Infiltration		2.5				
60 minute summer	36	4.012	37	59.1	1.010	0.755	5.4060	
60 minute summer	36	Infiltration		10.3				
60 minute summer	37	Orifice	9	29.1				
60 minute summer	37	Infiltration		8.2				
240 minute summer	9	1.008	10	69.7	1.626	0.424	2.4160	
360 minute summer	10	Orifice	11	9.6				

Results for 100 year +50% CC Critical Storm Duration. Lowest mass balance: 98.75%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
240 minute summer	11	188	134.375	0.053	9.6	0.0595	0.0000	OK
240 minute summer	12	188	131.648	0.060	9.6	0.0095	0.0000	OK
240 minute summer	13	188	129.713	0.104	9.6	0.0165	0.0000	OK
240 minute summer	14	188	129.624	0.091	9.6	0.0000	0.0000	OK
15 minute summer	46	10	144.895	0.103	10.9	0.1606	0.0000	OK
15 minute summer	47	11	145.702	0.077	20.4	1.3909	0.0000	OK
30 minute summer	48	19	143.879	0.104	26.2	1.7491	0.0000	OK
30 minute summer	49	20	142.617	0.092	23.6	0.5517	0.0000	OK
30 minute summer	50	21	142.276	0.354	29.6	2.0866	0.0000	SURCHARGED
15 minute summer	51	11	145.026	0.050	12.8	0.7307	0.0000	OK
30 minute summer	52	20	142.435	0.129	15.0	1.0640	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
360 minute summer	10	Infiltration		15.4				
240 minute summer	11	1.010	12	9.6	1.603	0.263	0.3918	
240 minute summer	12	1.011	13	9.6	1.047	0.335	0.7412	
240 minute summer	13	1.012	14	9.6	0.797	0.770	0.1827	73.5
15 minute summer	46	7.000	17	10.7	0.817	0.743	0.2059	
15 minute summer	47	8.000	48	18.2	1.735	0.521	0.5305	
15 minute summer	47	Infiltration		1.3				
30 minute summer	48	8.001	49	23.6	1.960	0.799	0.5494	
30 minute summer	48	Infiltration		1.2				
30 minute summer	49	8.002	50	22.4	1.409	0.666	0.2446	
30 minute summer	49	Infiltration		0.4				
30 minute summer	50	8.003	30	26.1	1.653	0.805	0.2753	
30 minute summer	50	Infiltration		0.6				
15 minute summer	51	9.000	52	11.4	1.342	0.243	0.4048	
15 minute summer	51	Infiltration		1.0				
30 minute summer	52	9.001	6	12.7	0.860	1.017	0.3478	
30 minute summer	52	Infiltration		0.6				