



Engineering Assessment Report - Appendices

Proposed LRD at Ballycullen, Dublin 16

April 2025

Waterman Moylan Consulting Engineers Limited

Block S, East Point Business Park, Alfie Byrne Road, Dublin D03 H3F4
www.waterman-moylan.ie

Client Name: Lagan Homes Ballycullen Limited
Document Reference: 24-007r.008 Engineering Assessment Report - Appendices
Project Number: 24-007

Quality Assurance – Approval Status

This document has been prepared and checked in accordance with
Waterman Group's IMS (BS EN ISO 9001: 2015, BS EN ISO 14001: 2015)

Issue	Date	Prepared by	Checked by	Approved by
1	Apr '25	L. Mugo	E. Caulwell	E. Caulwell
Comments				

Disclaimer

This report has been prepared by Waterman Moylan, with all reasonable skill, care and diligence within the terms of the Contract with the Client, incorporation of our General Terms and Condition of Business and taking account of the resources devoted to us by agreement with the Client.

We disclaim any responsibility to the Client and others in respect of any matters outside the scope of the above.

This report is confidential to the Client and we accept no responsibility of whatsoever nature to third parties to whom this report, or any part thereof, is made known. Any such party relies on the report at its own risk.

Appendices

- A.** Uisce Éireann Confirmation of Feasibility (400 units)
- B.** Uisce Éireann Confirmation of Feasibility (506 units)
- C.** Greenfield Runoff Reports
- D.** Surface Water Calculations
- E.** Report On Site Investigation and Soil Infiltration Test
- F.** Uisce Éireann Statement of Design Acceptance

APPENDICES

A. Uisce Éireann Confirmation of Feasibility (400 units)

- **Wastewater Connection** - Feasible without infrastructure upgrade by Irish Water
- There are two proposed connection points: via existing Stocking Wood Estate and to the existing 225mm gravity sewer on Abbot's Grove. The wastewater network serving Stocking Wood Estate hasn't been taken in charge by Uisce Éireann. Please note, where any connection is proposed to private infrastructure, the customer is to provide, at a connection application stage, written confirmation from the owner of the infrastructure that you have received a legal permission to connect to and that the infrastructure is fit for purpose and has capacity to cater for the additional load.

This letter does not constitute an offer, in whole or in part, to provide a connection to any Uisce Éireann infrastructure. Before the Development can be connected to our network(s) you must submit a connection application and be granted and sign a connection agreement with Uisce Éireann.

As the network capacity changes constantly, this review is only valid at the time of its completion. As soon as planning permission has been granted for the Development, a completed connection application should be submitted. The connection application is available at www.water.ie/connections/get-connected/

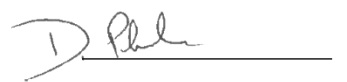
Where can you find more information?

- **Section A** - What is important to know?
- **Section B** - Details of Uisce Éireann's Network(s)

This letter is issued to provide information about the current feasibility of the proposed connection(s) to Uisce Éireann's network(s). This is not a connection offer and capacity in Uisce Éireann's network(s) may only be secured by entering into a connection agreement with Uisce Éireann.

For any further information, visit www.water.ie/connections, email newconnections@water.ie or contact 1800 278 278.

Yours sincerely,



Dermot Phelan
Connections Delivery Manager

Section A - What is important to know?

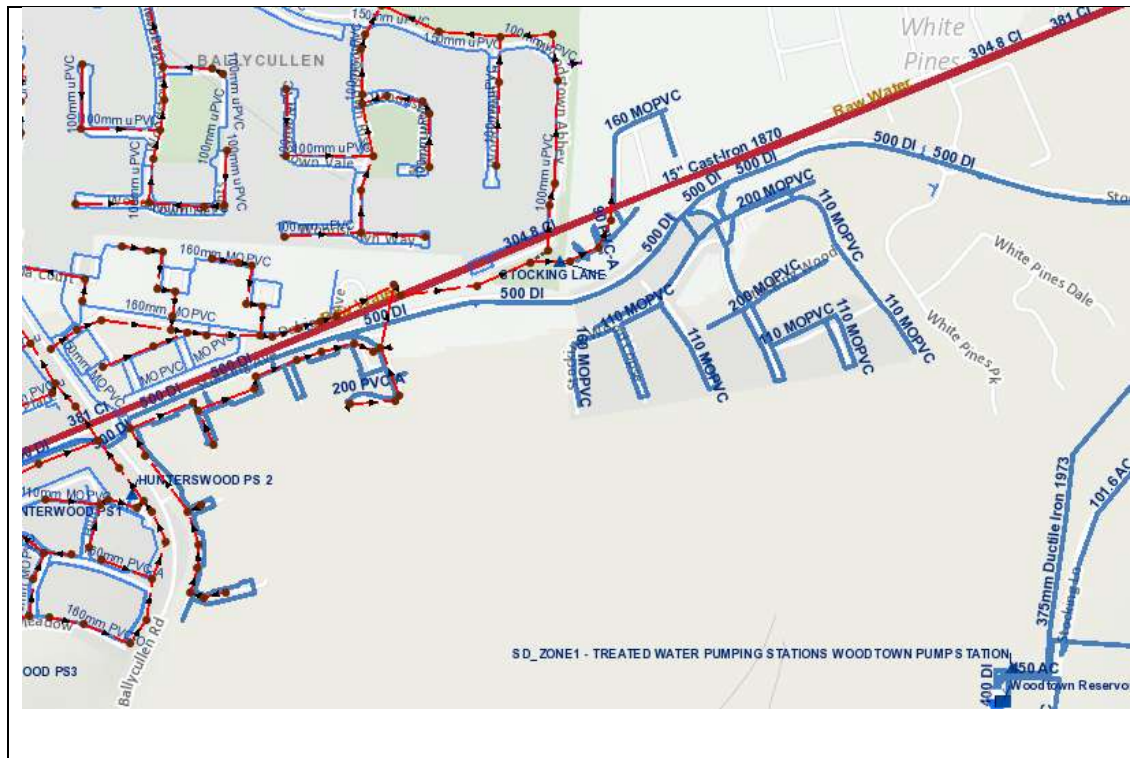
What is important to know?	Why is this important?
Do you need a contract to connect?	• Yes, a contract is required to connect. This letter does not constitute a contract or an offer in whole or in part to provide a connection to Uisce Éireann's network(s). • Before the Development can connect to Uisce Éireann's network(s), you must submit a connection application <u>and be granted and sign</u> a connection agreement with Uisce Éireann.
When should I submit a Connection Application?	• A connection application should only be submitted after planning permission has been granted.
Where can I find information on connection charges?	• Uisce Éireann connection charges can be found at: https://www.water.ie/connections/information/charges/
Who will carry out the connection work?	• All works to Uisce Éireann's network(s), including works in the public space, must be carried out by Uisce Éireann*. *Where a Developer has been granted specific permission and has been issued a connection offer for Self-Lay in the Public Road/Area, they may complete the relevant connection works
Fire flow Requirements	• The Confirmation of Feasibility does not extend to fire flow requirements for the Development. Fire flow requirements are a matter for the Developer to determine. • What to do? - Contact the relevant Local Fire Authority
Plan for disposal of storm water	• The Confirmation of Feasibility does not extend to the management or disposal of storm water or ground waters. • What to do? - Contact the relevant Local Authority to discuss the management or disposal of proposed storm water or ground water discharges.
Where do I find details of Uisce Éireann's network(s)?	• Requests for maps showing Uisce Éireann's network(s) can be submitted to: datarequests@water.ie

What are the design requirements for the connection(s)?	• The design and construction of the Water & Wastewater pipes and related infrastructure to be installed in this Development shall comply with <i>the Uisce Éireann Connections and Developer Services Standard Details and Codes of Practice</i>, available at www.water.ie/connections
Trade Effluent Licensing	• Any person discharging trade effluent** to a sewer, must have a Trade Effluent Licence issued pursuant to section 16 of the Local Government (Water Pollution) Act, 1977 (as amended). • More information and an application form for a Trade Effluent License can be found at the following link: https://www.water.ie/business/trade-effluent/about/ **trade effluent is defined in the Local Government (Water Pollution) Act, 1977 (as amended)

Section B – Details of Uisce Éireann’s Network(s)

The map included below outlines the current Uisce Éireann infrastructure adjacent the Development: To access Uisce Éireann Maps email

datarequests@water.ie



Reproduced from the Ordnance Survey of Ireland by Permission of the Government. License No. 3-3-34

Note: The information provided on the included maps as to the position of Uisce Éireann’s underground network(s) is provided as a general guide only. The information is based on the best available information provided by each Local Authority in Ireland to Uisce Éireann.

Whilst every care has been taken in respect of the information on Uisce Éireann’s network(s), Uisce Éireann assumes no responsibility for and gives no guarantees, undertakings or warranties concerning the accuracy, completeness or up to date nature of the information provided, nor does it accept any liability whatsoever arising from or out of any errors or omissions. This information should not be solely relied upon in the event of excavations or any other works being carried out in the vicinity of Uisce Éireann’s underground network(s). The onus is on the parties carrying out excavations or any other works to ensure the exact location of Uisce Éireann’s underground network(s) is identified prior to excavations or any other works being carried out. Service connection pipes are not generally shown but their presence should be anticipated.

B. Uisce Éireann Confirmation of Feasibility (506 units)

CONFIRMATION OF FEASIBILITY

Lydian Mugo

Waterman Moylan
Block S, Eastpoint
Business Park,
Alfie Byrne Road
Dublin
D03H3F4

Uisce Éireann
Bosca OP 448
Oifig Sheachadta na
Cathrach Theas
Cathair Chorcaí

Uisce Éireann
PO Box 448
South City
Delivery Office
Cork City

www.water.ie

5 March 2025

**Our Ref: CDS24010539 Pre-Connection Enquiry
Woodstown, Ballycullen, Dublin**

Dear Applicant/Agent,

We have completed the review of the Pre-Connection Enquiry.

Uisce Éireann has reviewed the pre-connection enquiry in relation to a Water & Wastewater connection for a Multi/Mixed Use Development of 506 unit(s) at Woodstown, Ballycullen, Dublin, Dublin, (the **Development**).

Based upon the details provided we can advise the following regarding connecting to the networks;

- **Water Connection** - Feasible without infrastructure upgrade by Uisce Éireann
- A bulk meter to be installed on the proposed 200mm ID connection main. A new pressure reducing valve will be required on the existing 200mm main (as shown below):



- **Wastewater Connection** - Feasible without infrastructure upgrade by Uisce Éireann
- There are two proposed connection points: via existing Stocking Wood Estate and to the existing 225mm gravity sewer on Abbot's Grove. The wastewater network serving Stocking Wood Estate hasn't been taken in charge by Uisce Éireann. Please note, where any connection is proposed to private infrastructure, the customer is to provide, at a connection application stage, written confirmation from the owner of the infrastructure that you have received a legal permission to connect to and that the infrastructure is fit for purpose and has capacity to cater for the additional load.

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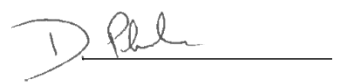
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Yours sincerely,



Dermot Phelan
Connections Delivery Manager

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C. Greenfield Runoff Reports

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	26/03/2025
Calculated by	Lydia Mugo
Reference	24-007
Model version	0.6.5

Location

Site name	Ballycullen
Site location	West Catchment



Site easting	111777
Site northing	383512

Site details

Total site area (ha)	5.1251	ha
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Greenfield runoff

Method

Method	IH124		
My value		Map value	
SAAR (mm)	997	☐	1052
How should SPR be derived?	WRAP soil type		
WRAP soil type	4	☐	2
SPR	0.47	☐	0.47
QBar (IH124) (l/s)	37.4		

Growth curve factors

	My value	Map value	
Hydrological region	12	☐	12
1 year growth factor	0.85		
2 year growth factor	0.95		
10 year growth factor	1.72		
30 year growth factor	2.13		
100 year growth factor	2.61		
200 year growth factor	2.86		

Results

Method	IH124	
Flow rate 1 year (l/s)	31.8	l/s
Flow rate 2 year (l/s)	35.5	l/s
Flow rate 10 years (l/s)	64.4	l/s
Flow rate 30 years (l/s)	79.7	l/s
Flow rate 100 years (l/s)	97.7	l/s
Flow rate 200 years (l/s)	107	l/s

Disclaimer

This report was produced using the Greenfield runoff rate estimation tool (0.6.5) developed by HR Wallingford and available at [uksuds.com](https://www.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) (<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.

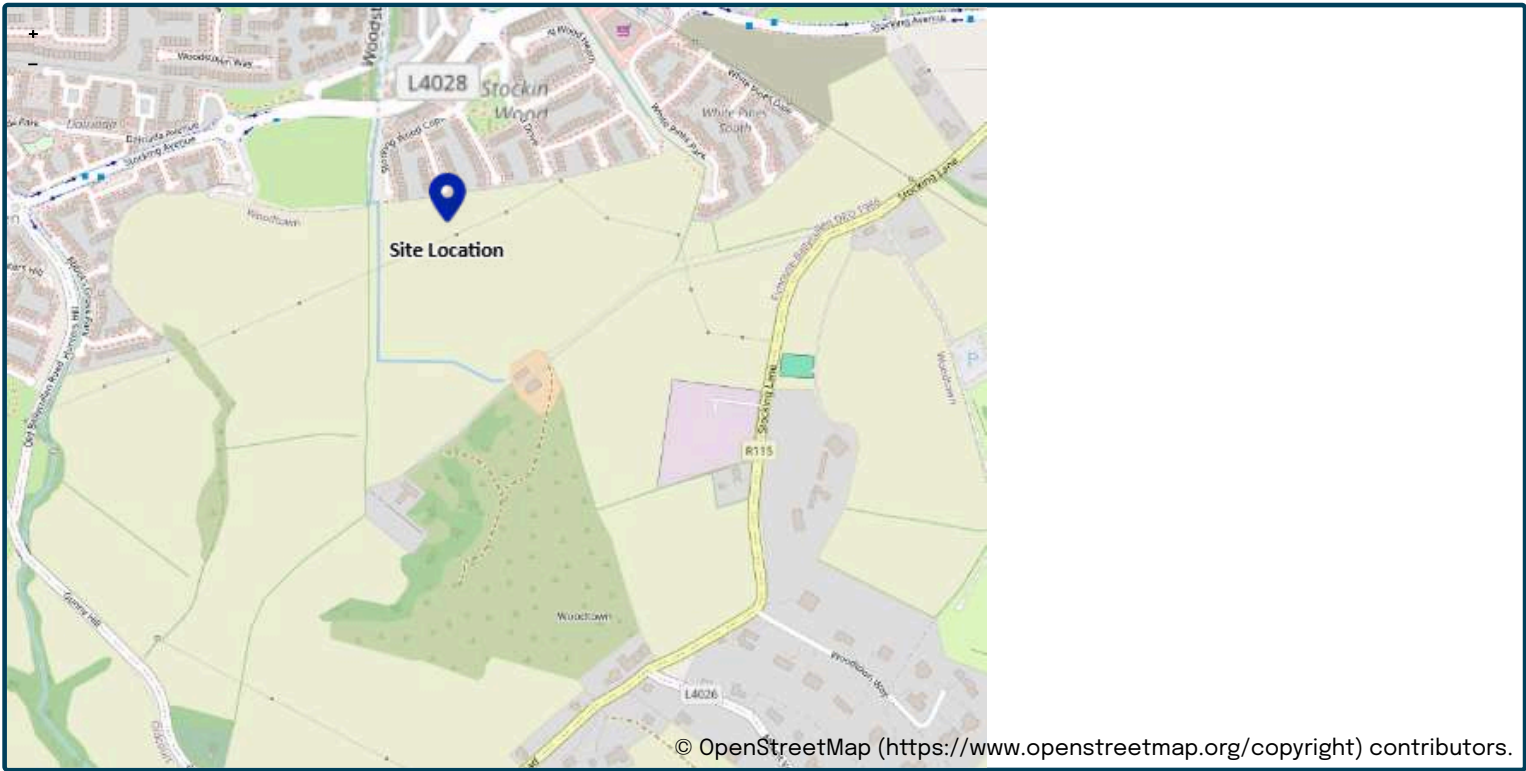
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Project details

Date	26/03/2025
Calculated by	Lydiah Mugo
Reference	24-007
Model version	0.6.5

Location

Site name	Ballycullen
Site location	East Catchment



Site easting	112122
Site northing	383515

Site details

Total site area (ha)	4.8124	ha
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Greenfield runoff

Method

Method	IH124		
My value		Map value	
SAAR (mm)	997 mm	☐	1052
How should SPR be derived?	WRAP soil type		
WRAP soil type	4	☐	2
SPR	0.47	☐	0.47
QBar (IH124) (l/s)	35.1 l/s		

Growth curve factors

	My value	Map value
Hydrological region	12	☐ 12
1 year growth factor	0.85	
2 year growth factor	0.95	
10 year growth factor	1.72	
30 year growth factor	2.13	
100 year growth factor	2.61	
200 year growth factor	2.86	

Results

Method	IH124
Flow rate 1 year (l/s)	29.9 l/s
Flow rate 2 year (l/s)	33.4 l/s
Flow rate 10 years (l/s)	60.4 l/s
Flow rate 30 years (l/s)	74.9 l/s
Flow rate 100 years (l/s)	91.7 l/s
Flow rate 200 years (l/s)	100.5 l/s

Disclaimer

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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) (<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.

D. Surface Water Calculations

Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	5	Maximum Rainfall (mm/hr)	50.0
Additional Flow (%)	0	Minimum Velocity (m/s)	1.00
FSR Region	Scotland and Ireland	Connection Type	Level Soffits
M5-60 (mm)	18.400	Minimum Backdrop Height (m)	0.200
Ratio-R	0.216	Preferred Cover Depth (m)	1.200
CV	1.000	Include Intermediate Ground	✓
Time of Entry (mins)	4.00	Enforce best practice design rules	x

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
501	0.018	4.00	111.400	1200	711903.551	725754.555	1.425
502	0.051	4.00	111.875	1200	711919.081	725750.795	1.980
503	0.036	4.00	111.519	1200	711932.495	725747.611	1.693
504	0.019	4.00	111.160	1200	711943.710	725756.071	1.490
505	0.028	4.00	114.100	1200	711989.234	725736.024	3.236
506	0.020	4.00	113.243	1200	711984.183	725748.774	3.002
507	0.030	4.00	111.104	1200	711950.631	725757.870	1.470
508	0.028	4.00	110.710	1200	711945.464	725769.057	1.425
DBW7	0.036	4.00	110.230		711949.925	725787.293	3.230
DBW2	0.042	4.00	110.000	1200	711916.091	725782.835	3.045
511	0.067	4.00	111.164	1200	711833.447	725733.562	1.557
512	0.010	4.00	113.208	1200	711863.990	725710.358	1.425
513	0.008	4.00	112.892	1200	711867.887	725725.243	1.675
514	0.007	4.00	112.424	1200	711879.333	725725.662	1.624
515	0.038	4.00	112.056	1200	711885.041	725731.026	1.612
516	0.034	4.00	111.070	1200	711892.358	725760.079	1.625
517	0.017	4.00	109.600	1200	711898.800	725787.045	3.600
DBW3	0.056	4.00	108.000	1200	711879.330	725792.024	2.595
519	0.039	4.00	108.062	1200	711833.366	725765.095	1.425
520	0.014	4.00	107.660	1200	711838.235	725772.896	1.441
DBW4	0.010	4.00	107.100	1350	711851.149	725797.263	2.600
DBW5			106.600	1350	711836.275	725800.268	2.600
DBW6	0.016	4.00	105.500	1350	711816.550	725805.701	2.900
523	0.041	4.00	112.008	1200	711725.724	725678.646	1.779
524	0.016	4.00	111.200	1200	711713.010	725690.452	1.760
525	0.031	4.00	110.580	1200	711706.739	725699.302	1.633
526	0.010	4.00	109.900	1200	711701.350	725711.741	1.569
527	0.050	4.00	109.136	1200	711699.535	725727.536	1.528
528	0.067	4.00	108.270	1200	711702.890	725744.697	1.532
529	0.051	4.00	107.555	1200	711708.949	725758.535	1.304
530	0.039	4.00	107.085	1350	711714.751	725765.764	1.208
531	0.020	4.00	107.150	1350	711732.664	725778.280	1.346
532	0.040	4.00	107.880	1350	711750.158	725783.194	2.137
533	0.024	4.00	111.830	1200	711817.602	725712.555	2.358
534	0.070	4.00	110.310	1200	711769.958	725721.988	1.539
535	0.024	4.00	111.050	1200	711755.713	725694.113	1.425
536	0.036	4.00	110.605	1200	711755.487	725704.071	1.433
537	0.008	4.00	110.450	1200	711759.147	725720.053	1.551
538	0.033	4.00	110.056	1200	711764.462	725726.001	1.425
539	0.019	4.00	109.546	1200	711767.246	725743.024	1.700
540	0.034	4.00	109.140	1200	711774.947	725754.157	1.820

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
541	0.053	4.00	108.260	1200	711821.485	725765.016	1.425
542	0.003	4.00	108.701	1200	711780.583	725775.234	2.152
543	0.019	4.00	108.586	1350	711767.973	725781.975	4.128
DBW1	0.100	4.00	107.000	2400	711778.209	725799.547	4.500
EX			102.070	1350	711804.358	725817.947	1.190
547	0.006	4.00	111.419	1200	711825.890	725727.770	1.860
510			106.850	1350	711789.167	725800.045	4.387
544	0.026	4.00	111.800	1200	711809.394	725712.237	2.369
PP10	0.065	4.00	111.770	1200	711963.033	725762.355	0.500
PP1	0.101	4.00	108.050	1200	711736.730	725796.939	0.500
PP2	0.021	4.00	108.400	1200	711691.502	725749.033	0.500
PP3	0.074	4.00	109.900	1200	711691.887	725701.321	0.400
PP4	0.125	4.00	108.460	1200	711805.246	725775.307	0.500
518	0.040	4.00	111.770	1200	711964.112	725754.437	1.425
J6			110.230	1200	711987.615	725789.099	1.730
21			102.350	1350	711801.643	725812.826	1.283
22			107.500	1200	711860.218	725795.387	2.721
545	0.012	4.00	107.100	1350	711842.926	725798.488	2.923
549		4.00	112.216	1200	711817.111	725704.649	1.425
PP5	0.057	4.00	107.660	1200	711844.407	725774.938	0.500
PP6	0.062	4.00	111.000	1200	711886.289	725767.273	0.500
PP7	0.033	4.00	110.750	1200	711938.235	725767.175	0.500
PP8	0.075	4.00	111.800	1200	711816.305	725727.434	0.500
PP9	0.080	4.00	108.710	1200	711758.042	725741.832	0.500
PP11	0.040	4.00	108.710	1200	711773.723	725737.811	0.500
PP12	0.038	4.00	108.450	1200	711750.864	725774.473	0.500
509			104.075	1350	711805.357	725811.040	2.875
550			106.400	1350	711830.133	725801.879	3.200
551			110.000	1200	711943.683	725789.301	3.022
PP13	0.035	4.00	109.200		711714.745	725717.965	0.500
PP14	0.018	4.00	110.600		711714.836	725699.268	0.500

Links

Name	US Node	DS Node	Length (m)	US IL (m)	DS IL (m)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1	501	502	15.979	109.975	109.895	225	4.29	50.0
2	502	503	13.787	109.895	109.826	225	4.54	50.0
3	503	504	14.048	109.826	109.670	225	4.71	50.0
4	504	507	7.151	109.670	109.634	225	4.84	50.0

Name	Vel (m/s)	Cap (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)
1	0.921	36.6	1.200	1.755	0.018
2	0.921	36.6	1.755	1.468	0.069
3	1.379	54.8	1.468	1.265	0.106
4	0.921	36.6	1.265	1.245	0.124

Links

Name	US Node	DS Node	Length (m)	US IL (m)	DS IL (m)	Dia (mm)	T of C (mins)	Rain (mm/hr)
5	505	506	13.714	110.864	110.241	225	4.08	50.0
18	518	506	20.855	110.345	110.241	225	4.38	50.0
7	507	508	12.323	109.634	109.285	225	4.93	50.0
8	508	DBW7	18.774	109.285	108.432	225	5.04	50.0
j7	DBW7	551	6.557	107.000	106.978	300	5.16	50.0
DBW2	DBW2	517	7.000	106.955	106.932	300	5.42	50.0
13	513	511	35.430	111.217	109.607	225	4.32	50.0
12	512	513	15.387	111.783	111.270	225	4.11	50.0
49	549	533	7.921	110.791	110.431	225	4.05	50.0
14	514	515	7.833	110.800	110.444	225	4.05	50.0
15	515	516	29.960	110.444	109.445	225	4.25	50.0
16	516	517	27.725	109.445	108.185	225	4.42	50.0
17	517	DBW3	20.097	106.000	105.405	300	5.55	50.0
DBW3	DBW3	22	19.407	105.405	104.779	300	5.66	50.0
19	519	520	9.196	106.637	106.219	225	4.05	50.0
20	520	545	26.018	106.219	105.458	225	4.30	50.0
DBW4	DBW4	545	10.000	104.500	104.177	375	5.77	50.0
DBW6	DBW6	509	12.402	102.600	102.332	375	6.05	50.0
23	523	524	17.350	110.229	109.440	225	4.10	50.0
24	524	525	10.847	109.440	108.947	225	4.17	50.0
25	525	526	13.556	108.947	108.331	225	4.25	50.0
26	526	527	15.899	108.331	107.608	225	4.34	50.0
27	527	528	17.486	107.608	106.813	225	4.51	50.0
28	528	529	15.106	106.738	106.251	300	4.60	50.0

Name	Vel (m/s)	Cap (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)
5	2.801	111.4	3.011	2.777	0.028
18	0.921	36.6	1.200	2.777	0.040
7	2.209	87.8	1.245	1.200	0.219
8	2.801	111.4	1.200	1.573	0.280
j7	0.902	63.8	2.930	2.722	0.404
DBW2	0.902	63.8	2.745	2.368	0.445
13	2.801	111.4	1.450	1.332	0.018
12	2.397	95.3	1.200	1.397	0.010
49	2.801	111.4	1.200	1.174	0.000
14	2.801	111.4	1.399	1.387	0.007
15	2.397	95.3	1.387	1.400	0.046
16	2.801	111.4	1.400	1.190	0.142
17	2.714	191.8	3.300	2.295	0.604
DBW3	2.834	200.3	2.295	2.421	0.660
19	2.801	111.4	1.200	1.216	0.039
20	2.245	89.2	1.216	1.417	0.110
DBW4	3.264	360.5	2.225	2.548	0.671
DBW6	2.669	294.8	2.525	1.368	0.809
23	2.801	111.4	1.554	1.535	0.041
24	2.801	111.4	1.535	1.408	0.057
25	2.801	111.4	1.408	1.344	0.107
26	2.801	111.4	1.344	1.303	0.191
27	2.801	111.4	1.303	1.232	0.277
28	2.834	200.3	1.232	1.004	0.344

Links

Name	US Node	DS Node	Length (m)	US IL (m)	DS IL (m)	Dia (mm)	T of C (mins)	Rain (mm/hr)
29	529	530	9.270	106.251	105.952	300	4.65	50.0
30	530	531	21.852	105.877	105.804	375	5.00	50.0
31	531	532	18.171	105.804	105.743	375	5.29	50.0
32	532	543	17.857	105.743	105.683	375	5.58	50.0
47	547	533	17.326	109.559	109.472	225	4.80	50.0
34	534	538	6.805	108.771	108.631	225	5.45	50.0
35	535	536	9.961	109.625	109.172	225	4.06	50.0
36	536	537	16.396	109.172	108.899	225	4.22	50.0
37	537	538	7.977	108.899	108.631	225	4.28	50.0
38	538	539	17.260	108.631	107.846	225	5.55	50.0
39	539	540	13.537	107.846	107.395	225	5.64	50.0
40	540	542	21.818	107.320	107.247	300	6.05	50.0
41	541	542	42.159	106.835	106.624	225	4.76	50.0
42	542	543	14.299	106.549	106.501	300	6.31	50.0
43	543	DBW1	20.336	104.458	104.000	375	6.43	50.0
DBW1	DBW1	510	10.969	102.500	102.463	375	6.61	50.0
44	544	534	40.624	109.431	108.851	225	5.39	50.0
11	511	547	9.521	109.607	109.559	225	4.49	50.0
10	510	509	19.571	102.463	101.832	375	6.71	50.0
PP10	PP10	507	13.188	111.270	110.671	100	4.13	50.0
PP1	PP1	543	34.642	107.550	107.096	100	4.65	50.0
PP2	PP2	529	19.867	107.900	107.238	225	4.14	50.0
PP3	PP3	526	14.076	109.500	109.263	100	4.23	50.0

Name	Vel (m/s)	Cap (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)
29	2.834	200.3	1.004	0.833	0.416
30	1.041	114.9	0.833	0.971	0.455
31	1.041	114.9	0.971	1.762	0.474
32	1.041	114.9	1.762	2.528	0.514
47	0.921	36.6	1.635	2.133	0.092
34	1.880	74.8	1.314	1.200	0.286
35	2.801	111.4	1.200	1.208	0.024
36	1.691	67.2	1.208	1.326	0.060
37	2.407	95.7	1.326	1.200	0.069
38	2.801	111.4	1.200	1.475	0.388
39	2.397	95.3	1.475	1.520	0.407
40	0.902	63.8	1.520	1.154	0.560
41	0.921	36.6	1.200	1.852	0.053
42	0.902	63.8	1.852	1.785	0.740
43	2.725	301.0	3.753	2.625	1.412
DBW1	1.041	114.9	4.125	4.012	1.512
44	1.565	62.2	2.144	1.234	0.217
11	0.921	36.6	1.332	1.635	0.086
10	3.264	360.5	4.012	1.868	1.512
PP10	1.653	13.0	0.400	0.333	0.065
PP1	0.882	6.9	0.400	1.390	0.101
PP2	2.397	95.3	0.275	0.092	0.021
PP3	1.001	7.9	0.300	0.537	0.074

Links

Name	US Node	DS Node	Length (m)	US IL (m)	DS IL (m)	Dia (mm)	T of C (mins)	Rain (mm/hr)
PP4	PP4	542	24.663	107.960	107.545	100	4.41	50.0
21	21	EX	5.796	101.067	100.880	375	6.76	50.0
22	22	DBW4	9.261	104.779	104.500	300	5.72	50.0
45	545	DBW5	6.885	104.177	104.000	375	5.81	50.0
33	533	544	8.214	109.472	109.431	225	4.95	50.0
PP5	PP5	520	6.501	107.160	107.050	100	4.11	50.0
PP6	PP6	516	9.412	110.500	110.340	100	4.16	50.0
PP7	PP7	508	7.470	110.250	110.124	100	4.12	50.0
PP8	PP8	533	14.935	111.300	111.049	100	4.25	50.0
PP9	PP9	540	20.921	108.210	107.827	100	4.33	50.0
PP11	PP11	540	16.392	108.210	107.934	100	4.27	50.0
PP12	PP12	543	18.682	107.950	107.620	100	4.30	50.0
6	506	J6	40.471	110.241	108.500	225	4.63	50.0
j6	J6	DBW7	37.733	108.500	108.000	225	5.04	50.0
DBW5	DBW5	550	6.350	104.000	103.979	375	5.91	50.0
9	509	21	4.121	101.200	101.067	375	6.73	50.0
16.012	550	DBW6	14.110	103.200	102.600	375	5.97	50.0
551	551	DBW2	7.000	106.978	106.955	300	5.29	50.0
12.000	PP13	527	17.971	108.700	108.533	100	4.40	50.0
10.000	PP14	525	8.097	110.100	109.872	100	4.10	50.0

Name	Vel (m/s)	Cap (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)
PP4	1.001	7.9	0.400	1.056	0.125
21	3.264	360.5	0.908	0.815	2.321
22	2.738	193.5	2.421	2.300	0.660
45	2.912	321.7	2.548	2.225	0.793
33	0.921	36.6	2.133	2.144	0.191
PP5	1.004	7.9	0.400	0.510	0.057
PP6	1.006	7.9	0.400	0.630	0.062
PP7	1.002	7.9	0.400	0.486	0.033
PP8	1.000	7.9	0.400	0.681	0.075
PP9	1.044	8.2	0.400	1.213	0.080
PP11	1.001	7.9	0.400	1.106	0.040
PP12	1.026	8.1	0.400	0.866	0.038
6	2.725	108.3	2.777	1.505	0.088
j6	1.507	59.9	1.505	2.005	0.088
DBW5	1.041	114.9	2.225	2.046	0.793
9	3.264	360.5	2.500	0.908	2.321
16.012	3.749	414.1	2.825	2.525	0.793
551	0.902	63.8	2.722	2.745	0.404
12.000	0.741	5.8	0.400	0.503	0.035
10.000	1.298	10.2	0.400	0.608	0.018

Simulation Settings

Rainfall Methodology	FSR	Analysis Speed	Normal
Rainfall Events	Singular	Skip Steady State	x
FSR Region	Scotland and Ireland	Drain Down Time (mins)	240
M5-60 (mm)	18.400	Additional Storage (m ³ /ha)	20.0
Ratio-R	0.216	Starting Level (m)	
Summer CV	1.000	Check Discharge Rate(s)	x
Winter CV	1.000	Check Discharge Volume	x

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 %)
1	0	0	0
5	0	0	0
10	0	0	0
30	0	0	0
100	20	0	0

Node DBW7 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	107.000	Product Number	CTL-SHE-0046-1600-3000-1600
Design Depth (m)	3.000	Min Outlet Diameter (m)	0.075
Design Flow (l/s)	1.6	Min Node Diameter (mm)	1200

Node DBW2 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	106.955	Product Number	CTL-SHE-0031-7000-2545-7000
Design Depth (m)	2.545	Min Outlet Diameter (m)	0.075
Design Flow (l/s)	0.7	Min Node Diameter (mm)	1200

Node DBW3 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	105.405	Product Number	CTL-SHE-0067-3000-2500-3000
Design Depth (m)	2.500	Min Outlet Diameter (m)	0.100
Design Flow (l/s)	3.0	Min Node Diameter (mm)	1200

Node DBW4 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	104.500	Product Number	CTL-SHE-0063-2700-2500-2700
Design Depth (m)	2.500	Min Outlet Diameter (m)	0.075
Design Flow (l/s)	2.7	Min Node Diameter (mm)	1200

Node DBW5 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	104.000	Product Number	CTL-SHE-0069-3200-2500-3200
Design Depth (m)	2.500	Min Outlet Diameter (m)	0.100
Design Flow (l/s)	3.2	Min Node Diameter (mm)	1200

Node DBW6 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	102.600	Product Number	CTL-SHE-0065-2600-2000-2600
Design Depth (m)	2.000	Min Outlet Diameter (m)	0.100
Design Flow (l/s)	2.6	Min Node Diameter (mm)	1200

Node DBW1 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	102.500	Product Number	CTL-SHE-0201-2800-3000-2800
Design Depth (m)	3.000	Min Outlet Diameter (m)	0.225
Design Flow (l/s)	28.0	Min Node Diameter (mm)	2400

Node DBW7 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	107.000
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	

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	240.0	0.0	3.000	240.0	0.0	3.001	0.0	0.0

Node DBW2 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	106.955
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	

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	115.0	0.0	2.545	115.0	0.0	2.546	0.0	0.0

Node DBW3 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	105.405
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	

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	62.5	0.0	2.500	62.5	0.0	2.501	0.0	0.0

Node DBW4 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	104.500
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	

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	27.5	0.0	2.500	27.5	0.0	2.501	0.0	0.0

Node DBW5 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	104.000
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	

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	23.4	0.0	2.500	23.4	0.0	2.501	0.0	0.0

Node DBW6 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	102.600
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	

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	41.2	0.0	2.000	41.2	0.0	2.001	0.0	0.0

Node DBW1 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	102.500
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	405

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	263.0	0.0	3.000	263.0	0.0	3.001	0.0	0.0

Node PP10 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	111.270
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.30	Time to half empty (mins)	9

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	270.0	0.0	0.350	270.0	0.0	0.351	0.0	0.0

Node PP1 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	107.550
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.30	Time to half empty (mins)	62

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	252.0	0.0	0.350	252.0	0.0	0.351	0.0	0.0

Node PP2 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	107.900
Side Inf Coefficient (m/hr)	0.00000	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	48.0	0.0	0.350	48.0	0.0	0.351	0.0	0.0

Node PP3 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	109.500
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.30	Time to half empty (mins)	38

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	201.0	0.0	0.350	201.0	0.0	0.351	0.0	0.0

Node PP4 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	107.960
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.30	Time to half empty (mins)	70

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	323.0	0.0	0.350	323.0	0.0	0.351	0.0	0.0

Node PP5 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	107.160
Side Inf Coefficient (m/hr)	0.00000	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	190.0	0.0	0.350	190.0	0.0	0.351	0.0	0.0

Node PP6 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	110.500
Side Inf Coefficient (m/hr)	0.00000	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	233.0	0.0	0.350	233.0	0.0	0.351	0.0	0.0

Node PP7 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	110.250
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.30	Time to half empty (mins)	5

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	125.8	0.0	0.350	125.8	0.0	0.351	0.0	0.0

Node PP8 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	111.300
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.30	Time to half empty (mins)	30

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	130.0	0.0	0.350	130.0	0.0	0.351	0.0	0.0

Node PP9 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	108.210
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.30	Time to half empty (mins)	32

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	191.0	0.0	0.350	191.0	0.0	0.351	0.0	0.0

Node PP11 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	108.210
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.30	Time to half empty (mins)	11

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	78.0	0.0	0.350	78.0	0.0	0.351	0.0	0.0

Node PP12 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	107.950
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.30	Time to half empty (mins)	10

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	47.0	0.0	0.350	47.0	0.0	0.351	0.0	0.0

Node PP13 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	108.700
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.30	Time to half empty (mins)	12

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	46.0	0.0	0.350	46.0	0.0	0.351	0.0	0.0

Node PP14 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	110.100
Side Inf Coefficient (m/hr)	0.00000	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	21.0	0.0	0.350	21.0	0.0	0.351	0.0	0.0

Other (defaults)

Entry Loss (manhole)	0.250	Entry Loss (junction)	0.000	Apply Recommended Losses	x
Exit Loss (manhole)	0.250	Exit Loss (junction)	0.000	Flood Risk (m)	0.300

Approval Settings

Node Size	✓	Minimum Full Bore Velocity (m/s)	
Node Losses	✓	Maximum Full Bore Velocity (m/s)	3.000
Link Size	✓	Proportional Velocity	✓
Minimum Diameter (mm)	150	Return Period (years)	
Link Length	✓	Minimum Proportional Velocity (m/s)	0.750
Maximum Length (m)	100.000	Maximum Proportional Velocity (m/s)	3.000
Coordinates	✓	Surcharged Depth	✓
Accuracy (m)	1.000	Return Period (years)	
Crossings	✓	Maximum Surcharged Depth (m)	0.100
Cover Depth	✓	Flooding	✓
Minimum Cover Depth (m)		Return Period (years)	30
Maximum Cover Depth (m)	3.000	Time to Half Empty	x
Backdrops	✓	Discharge Rates	✓
Minimum Backdrop Height (m)		Discharge Volume	✓
Maximum Backdrop Height (m)	1.500	100 year 360 minute (m ³)	
Full Bore Velocity	✓		

Results for 1 year Critical Storm Duration. Lowest mass balance: 99.87%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	501	10	110.018	0.043	3.0	0.0600	0.0000	OK
15 minute summer	502	10	109.987	0.092	11.5	0.1507	0.0000	OK
15 minute summer	503	10	109.919	0.093	17.4	0.1448	0.0000	OK
15 minute summer	504	10	109.792	0.122	20.5	0.1684	0.0000	OK
15 minute summer	505	10	110.896	0.031	4.7	0.0411	0.0000	OK
15 minute summer	506	10	110.297	0.056	14.6	0.0702	0.0000	OK
15 minute summer	507	10	109.726	0.092	27.1	0.1420	0.0000	OK
30 minute summer	508	18	109.371	0.086	32.9	0.1304	0.0000	OK
10080 minute winter	DBW7	7380	107.909	0.909	2.0	218.4467	0.0000	SURCHARGED
10080 minute winter	DBW2	7560	107.870	0.915	0.9	106.5440	0.0000	SURCHARGED
15 minute summer	511	10	109.712	0.105	14.2	0.2100	0.0000	OK
15 minute summer	512	10	111.804	0.021	1.7	0.0270	0.0000	OK
15 minute summer	513	10	111.242	0.025	3.0	0.0311	0.0000	OK
15 minute summer	514	10	110.817	0.017	1.2	0.0202	0.0000	OK
15 minute summer	515	10	110.487	0.043	7.5	0.0683	0.0000	OK
30 minute summer	516	18	109.501	0.056	14.6	0.0869	0.0000	OK
1440 minute summer	517	930	106.060	0.060	4.0	0.0739	0.0000	OK
1440 minute summer	DBW3	930	106.060	0.655	5.3	41.9906	0.0000	SURCHARGED
15 minute summer	519	10	106.674	0.037	6.5	0.0618	0.0000	OK
30 minute summer	520	18	106.273	0.054	10.8	0.0715	0.0000	OK
4320 minute summer	DBW4	3000	105.416	0.916	2.0	26.5745	0.0000	SURCHARGED
5760 minute summer	DBW5	3540	105.125	1.125	8.0	27.9325	0.0000	SURCHARGED
8640 minute winter	DBW6	5520	103.604	1.003	2.2	42.8940	0.0000	SURCHARGED
15 minute summer	523	10	110.267	0.038	6.9	0.0605	0.0000	OK
15 minute summer	524	10	109.485	0.045	9.6	0.0585	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	501	1	502	3.0	0.300	0.082	0.1635	
15 minute summer	502	2	503	11.5	0.748	0.313	0.2110	
15 minute summer	503	3	504	17.4	0.930	0.317	0.2627	
15 minute summer	504	4	507	20.3	1.091	0.555	0.1333	
15 minute summer	505	5	506	4.7	0.895	0.042	0.0752	
15 minute summer	506	6	J6	14.6	1.590	0.134	0.3836	
15 minute summer	507	7	508	26.9	1.850	0.306	0.1790	
30 minute summer	508	8	DBW7	32.8	2.413	0.295	0.2557	
10080 minute winter	DBW7	Hydro-Brake®	551	0.7				
10080 minute winter	DBW2	Hydro-Brake®	517	0.4				
15 minute summer	511	11	547	13.9	0.773	0.380	0.1712	
15 minute summer	512	12	513	1.7	0.915	0.018	0.0285	
15 minute summer	513	13	511	3.0	0.313	0.027	0.3655	
15 minute summer	514	14	515	1.2	0.392	0.011	0.0255	
15 minute summer	515	15	516	7.5	1.193	0.079	0.1922	
30 minute summer	516	16	517	14.6	1.921	0.131	0.2100	
1440 minute summer	517	17	DBW3	4.0	0.474	0.021	0.8092	
1440 minute summer	DBW3	Hydro-Brake®	22	1.9				
15 minute summer	519	19	520	6.5	1.209	0.058	0.0518	
30 minute summer	520	20	545	10.7	1.504	0.120	0.1858	
4320 minute summer	DBW4	Hydro-Brake®	545	1.7				
5760 minute summer	DBW5	Hydro-Brake®	550	2.2				
8640 minute winter	DBW6	Hydro-Brake®	509	1.9				
15 minute summer	523	23	524	6.9	1.390	0.062	0.0862	
15 minute summer	524	24	525	9.6	1.338	0.086	0.0784	

Results for 1 year Critical Storm Duration. Lowest mass balance: 99.87%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	525	10	109.009	0.062	17.5	0.0940	0.0000	OK
30 minute summer	526	18	108.398	0.067	21.5	0.0840	0.0000	OK
30 minute summer	527	18	107.697	0.089	33.1	0.1588	0.0000	OK
15 minute summer	528	10	106.837	0.099	43.8	0.1984	0.0000	OK
15 minute summer	529	10	106.370	0.119	54.7	0.2280	0.0000	OK
30 minute summer	530	18	106.088	0.211	59.5	0.4383	0.0000	OK
15 minute summer	531	11	106.025	0.221	62.5	0.3797	0.0000	OK
15 minute summer	532	11	105.963	0.220	68.3	0.3965	0.0000	OK
30 minute summer	533	18	109.605	0.133	23.4	0.1774	0.0000	OK
30 minute summer	534	18	108.901	0.130	36.8	0.2643	0.0000	OK
15 minute summer	535	10	109.654	0.029	3.9	0.0421	0.0000	OK
15 minute summer	536	10	109.233	0.061	9.9	0.1006	0.0000	OK
15 minute summer	537	10	108.951	0.052	11.3	0.0645	0.0000	OK
30 minute summer	538	18	108.744	0.113	52.1	0.1801	0.0000	OK
30 minute summer	539	18	107.977	0.131	54.8	0.1769	0.0000	OK
30 minute summer	540	18	107.580	0.260	68.4	0.3917	0.0000	OK
15 minute summer	541	10	106.909	0.074	8.8	0.1385	0.0000	OK
30 minute summer	542	19	106.854	0.305	80.5	0.3528	0.0000	SURCHARGED
30 minute summer	543	19	104.677	0.219	160.1	0.3330	0.0000	OK
360 minute summer	DBW1	232	103.150	0.650	71.0	174.1877	0.0000	SURCHARGED
360 minute summer	EX	232	100.951	0.071	29.1	0.0000	0.0000	OK
15 minute summer	547	10	109.662	0.103	14.9	0.1237	0.0000	OK
360 minute summer	510	232	102.535	0.072	27.4	0.1035	0.0000	OK
15 minute summer	544	11	109.537	0.106	26.6	0.1428	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	525	25	526	17.5	1.876	0.157	0.1268	
30 minute summer	526	26	527	21.5	1.768	0.193	0.1938	
30 minute summer	527	27	528	33.0	2.365	0.297	0.2444	
15 minute summer	528	28	529	43.6	1.890	0.217	0.3485	
15 minute summer	529	29	530	54.3	1.949	0.271	0.2647	
30 minute summer	530	30	531	59.4	0.910	0.517	1.4264	
15 minute summer	531	31	532	62.8	0.935	0.547	1.2213	
15 minute summer	532	32	543	68.6	1.112	0.597	1.1021	
30 minute summer	533	33	544	23.2	1.084	0.633	0.1756	
30 minute summer	534	34	538	36.7	1.694	0.490	0.1482	
15 minute summer	535	35	536	3.9	0.691	0.035	0.0583	
15 minute summer	536	36	537	9.9	1.265	0.147	0.1286	
15 minute summer	537	37	538	11.3	0.903	0.118	0.1066	
30 minute summer	538	38	539	52.0	2.371	0.467	0.3786	
30 minute summer	539	39	540	54.7	2.005	0.574	0.3994	
30 minute summer	540	40	542	67.5	1.161	1.059	1.2592	
15 minute summer	541	41	542	8.7	0.587	0.238	1.0513	
30 minute summer	542	42	543	81.1	1.236	1.272	0.9040	
30 minute summer	543	43	DBW1	160.6	2.604	0.534	1.2544	
360 minute summer	DBW1	Hydro-Brake®	510	27.4				
15 minute summer	547	47	533	14.7	0.708	0.401	0.3594	
360 minute summer	510	10	509	27.4	1.902	0.076	0.2818	
15 minute summer	544	44	534	26.7	1.490	0.429	0.7286	

Results for 1 year Critical Storm Duration. Lowest mass balance: 99.87%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute summer	PP10	37	111.314	0.044	8.2	3.7147	0.0000	OK
60 minute summer	PP1	38	107.627	0.077	12.7	6.1809	0.0000	OK
15 minute summer	PP2	11	107.927	0.027	3.5	0.4474	0.0000	OK
60 minute summer	PP3	37	109.564	0.064	9.3	4.1455	0.0000	OK
60 minute summer	PP4	38	108.039	0.079	15.7	8.0998	0.0000	OK
15 minute summer	518	10	110.412	0.067	6.6	0.1127	0.0000	OK
15 minute summer	J6	11	108.574	0.074	14.6	0.0839	0.0000	OK
360 minute summer	21	232	101.148	0.081	29.1	0.1165	0.0000	OK
4320 minute summer	22	3000	105.416	0.637	1.9	0.7205	0.0000	SURCHARGED
5760 minute summer	545	3540	105.125	0.948	2.9	1.4323	0.0000	SURCHARGED
15 minute summer	549	1	110.791	0.000	0.0	0.0000	0.0000	OK
60 minute summer	PP5	37	107.215	0.055	7.2	3.3084	0.0000	OK
60 minute summer	PP6	37	110.554	0.054	7.9	3.9433	0.0000	OK
60 minute summer	PP7	36	110.292	0.042	4.1	1.7035	0.0000	OK
30 minute summer	PP8	20	111.375	0.075	11.9	3.2279	0.0000	OK
60 minute summer	PP9	36	108.277	0.067	10.0	4.1240	0.0000	OK
30 minute summer	PP11	19	108.264	0.054	6.3	1.4215	0.0000	OK
30 minute summer	PP12	19	108.008	0.058	6.0	0.9652	0.0000	OK
360 minute summer	509	232	101.284	0.084	29.1	0.1203	0.0000	OK
8640 minute winter	550	5520	103.604	0.404	2.1	0.5774	0.0000	SURCHARGED
10080 minute winter	551	7560	107.870	0.892	0.7	1.0092	0.0000	SURCHARGED
30 minute summer	PP13	19	108.765	0.065	5.6	0.9941	0.0000	OK
15 minute summer	PP14	10	110.137	0.036	3.0	0.2561	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)
60 minute summer	PP10	PP10	507	4.8	1.499	0.373	0.0426	474.2
60 minute summer	PP1	PP1	543	6.3	0.989	0.904	0.2195	
15 minute summer	PP2	PP2	529	2.9	1.076	0.031	0.0538	
60 minute summer	PP3	PP3	526	5.4	1.053	0.685	0.0721	
60 minute summer	PP4	PP4	542	7.2	1.115	0.918	0.1595	
15 minute summer	518	18	506	6.6	0.760	0.180	0.1816	
15 minute summer	J6	j6	DBW7	14.0	1.236	0.234	0.4277	
360 minute summer	21	21	EX	29.1	1.815	0.081	0.0932	
4320 minute summer	22	22	DBW4	1.9	0.306	0.010	0.6522	
5760 minute summer	545	45	DBW5	8.0	0.301	0.025	0.7594	
15 minute summer	549	49	533	0.0	0.000	0.000	0.0000	
60 minute summer	PP5	PP5	520	4.1	0.970	0.517	0.0273	
60 minute summer	PP6	PP6	516	4.1	0.983	0.515	0.0389	
60 minute summer	PP7	PP7	508	2.7	0.881	0.342	0.0228	
30 minute summer	PP8	PP8	533	6.7	1.093	0.850	0.0912	
60 minute summer	PP9	PP9	540	6.1	1.126	0.749	0.1142	
30 minute summer	PP11	PP11	540	4.3	1.004	0.543	0.0698	
30 minute summer	PP12	PP12	543	4.8	1.055	0.600	0.0856	
360 minute summer	509	9	21	29.1	1.621	0.081	0.0742	
8640 minute winter	550	16.012	DBW6	2.1	0.356	0.005	1.5563	
10080 minute winter	551	551	DBW2	0.7	0.166	0.011	0.4929	
30 minute summer	PP13	12.000	527	4.3	0.808	0.744	0.0963	
15 minute summer	PP14	10.000	525	2.8	1.088	0.270	0.0205	

Results for 5 year Critical Storm Duration. Lowest mass balance: 99.87%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	501	10	110.028	0.053	4.6	0.0742	0.0000	OK
15 minute summer	502	10	110.013	0.118	17.4	0.1942	0.0000	OK
15 minute summer	503	10	109.947	0.121	26.4	0.1883	0.0000	OK
15 minute summer	504	10	109.828	0.158	31.1	0.2184	0.0000	OK
15 minute summer	505	10	110.902	0.038	7.1	0.0502	0.0000	OK
15 minute summer	506	10	110.310	0.069	22.2	0.0870	0.0000	OK
15 minute summer	507	10	109.755	0.121	42.2	0.1864	0.0000	OK
30 minute summer	508	18	109.396	0.111	51.3	0.1684	0.0000	OK
8640 minute summer	DBW7	6120	108.329	1.328	4.4	319.1266	0.0000	SURCHARGED
10080 minute winter	DBW2	7920	108.211	1.256	1.1	146.1658	0.0000	SURCHARGED
15 minute summer	511	10	109.746	0.139	21.6	0.2774	0.0000	OK
15 minute summer	512	10	111.809	0.026	2.6	0.0331	0.0000	OK
15 minute summer	513	10	111.248	0.031	4.6	0.0381	0.0000	OK
15 minute summer	514	10	110.821	0.020	1.9	0.0250	0.0000	OK
15 minute summer	515	10	110.497	0.053	11.5	0.0844	0.0000	OK
15 minute summer	516	10	109.516	0.071	22.9	0.1096	0.0000	OK
1440 minute summer	517	960	106.401	0.401	5.0	0.4906	0.0000	SURCHARGED
1440 minute summer	DBW3	960	106.401	0.996	6.7	63.8129	0.0000	SURCHARGED
15 minute summer	519	10	106.682	0.045	9.8	0.0755	0.0000	OK
30 minute summer	520	18	106.287	0.068	16.9	0.0904	0.0000	OK
2160 minute summer	DBW4	2220	105.693	1.193	2.1	34.6003	0.0000	SURCHARGED
4320 minute summer	DBW5	2700	105.328	1.328	5.1	32.9743	0.0000	SURCHARGED
10080 minute summer	DBW6	6420	103.935	1.335	2.5	57.0814	0.0000	SURCHARGED
15 minute summer	523	10	110.275	0.046	10.4	0.0739	0.0000	OK
15 minute summer	524	10	109.495	0.054	14.4	0.0716	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	501	1	502	4.6	0.331	0.125	0.2258	
15 minute summer	502	2	503	17.4	0.811	0.474	0.2949	
15 minute summer	503	3	504	26.4	1.022	0.482	0.3618	
15 minute summer	504	4	507	30.9	1.194	0.844	0.1845	
15 minute summer	505	5	506	7.1	1.001	0.064	0.1011	
15 minute summer	506	6	J6	22.2	1.762	0.205	0.5251	
15 minute summer	507	7	508	41.9	2.038	0.477	0.2535	
30 minute summer	508	8	DBW7	51.2	2.701	0.460	0.3562	
8640 minute summer	DBW7	Hydro-Brake®	551	0.8				
10080 minute winter	DBW2	Hydro-Brake®	517	0.5				
15 minute summer	511	11	547	21.1	0.823	0.576	0.2441	
15 minute summer	512	12	513	2.6	1.038	0.027	0.0385	
15 minute summer	513	13	511	4.6	0.337	0.041	0.5142	
15 minute summer	514	14	515	1.9	0.455	0.017	0.0345	
15 minute summer	515	15	516	11.5	1.332	0.121	0.2649	
15 minute summer	516	16	517	22.6	2.166	0.202	0.2888	
1440 minute summer	517	17	DBW3	5.0	0.440	0.026	1.4152	
1440 minute summer	DBW3	Hydro-Brake®	22	2.0				
15 minute summer	519	19	520	9.8	1.333	0.088	0.0712	
30 minute summer	520	20	545	16.8	1.704	0.189	0.2572	
2160 minute summer	DBW4	Hydro-Brake®	545	1.7				
4320 minute summer	DBW5	Hydro-Brake®	550	2.4				
10080 minute summer	DBW6	Hydro-Brake®	509	2.2				
15 minute summer	523	23	524	10.4	1.571	0.093	0.1150	
15 minute summer	524	24	525	14.4	1.484	0.129	0.1059	

Results for 5 year Critical Storm Duration. Lowest mass balance: 99.87%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	525	10	109.025	0.078	26.5	0.1175	0.0000	OK
15 minute summer	526	10	108.416	0.085	33.5	0.1067	0.0000	OK
15 minute summer	527	10	107.723	0.115	51.3	0.2057	0.0000	OK
15 minute summer	528	10	106.865	0.127	67.6	0.2554	0.0000	OK
15 minute summer	529	10	106.411	0.160	84.6	0.3068	0.0000	OK
15 minute summer	530	10	106.170	0.293	93.7	0.6069	0.0000	OK
15 minute summer	531	11	106.105	0.301	96.5	0.5177	0.0000	OK
15 minute summer	532	11	106.033	0.290	104.3	0.5232	0.0000	OK
15 minute summer	533	11	109.646	0.174	34.9	0.2316	0.0000	OK
15 minute summer	534	11	108.949	0.177	55.6	0.3615	0.0000	OK
15 minute summer	535	10	109.660	0.035	6.0	0.0518	0.0000	OK
15 minute summer	536	10	109.249	0.077	15.2	0.1264	0.0000	OK
15 minute summer	537	10	108.965	0.066	17.3	0.0813	0.0000	OK
15 minute summer	538	11	108.788	0.157	80.6	0.2507	0.0000	OK
15 minute summer	539	11	108.202	0.356	84.7	0.4797	0.0000	SURCHARGED
15 minute summer	540	11	107.735	0.415	102.4	0.6247	0.0000	SURCHARGED
30 minute summer	541	19	107.019	0.184	12.5	0.3438	0.0000	OK
30 minute summer	542	19	107.004	0.455	118.6	0.5260	0.0000	SURCHARGED
30 minute summer	543	19	104.753	0.295	237.3	0.4489	0.0000	OK
360 minute summer	DBW1	240	103.545	1.045	99.4	280.1443	0.0000	SURCHARGED
480 minute winter	EX	352	100.952	0.072	29.8	0.0000	0.0000	OK
15 minute summer	547	10	109.697	0.138	22.6	0.1654	0.0000	OK
120 minute summer	510	94	102.536	0.073	28.0	0.1046	0.0000	OK
15 minute summer	544	11	109.569	0.138	40.5	0.1860	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	525	25	526	26.5	2.058	0.238	0.1748	
15 minute summer	526	26	527	33.3	1.959	0.299	0.2707	
15 minute summer	527	27	528	50.7	2.618	0.455	0.3389	
15 minute summer	528	28	529	67.4	2.026	0.336	0.5027	
15 minute summer	529	29	530	84.0	1.970	0.419	0.4308	
15 minute summer	530	30	531	91.6	0.991	0.797	2.0434	
15 minute summer	531	31	532	96.0	1.032	0.836	1.6913	
15 minute summer	532	32	543	105.4	1.269	0.917	1.4783	
15 minute summer	533	33	544	35.0	1.191	0.955	0.2401	
15 minute summer	534	34	538	55.7	1.854	0.746	0.2148	
15 minute summer	535	35	536	6.0	0.776	0.054	0.0796	
15 minute summer	536	36	537	15.2	1.408	0.226	0.1772	
15 minute summer	537	37	538	17.3	0.961	0.181	0.1520	
15 minute summer	538	38	539	80.0	2.432	0.718	0.5981	
15 minute summer	539	39	540	82.4	2.073	0.865	0.5384	
15 minute summer	540	40	542	102.0	1.466	1.599	1.4461	
30 minute summer	541	41	542	13.1	0.504	0.358	1.5700	
30 minute summer	542	42	543	118.7	1.689	1.861	0.9722	
30 minute summer	543	43	DBW1	238.2	2.796	0.791	1.7270	
360 minute summer	DBW1	Hydro-Brake®	510	28.0				
15 minute summer	547	47	533	22.1	0.760	0.605	0.5026	
120 minute summer	510	10	509	28.0	1.914	0.078	0.2860	
15 minute summer	544	44	534	40.9	1.645	0.657	1.0086	

Results for 5 year Critical Storm Duration. Lowest mass balance: 99.87%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute summer	PP10	36	111.328	0.058	12.0	4.9110	0.0000	OK
60 minute summer	PP1	39	107.664	0.114	18.7	9.2237	0.0000	SURCHARGED
15 minute summer	PP2	11	107.934	0.034	5.2	0.5566	0.0000	OK
60 minute summer	PP3	37	109.588	0.088	13.7	5.7180	0.0000	OK
60 minute summer	PP4	40	108.078	0.118	23.1	12.1855	0.0000	SURCHARGED
15 minute summer	518	10	110.428	0.083	10.1	0.1410	0.0000	OK
15 minute summer	J6	10	108.594	0.094	22.2	0.1063	0.0000	OK
480 minute winter	21	352	101.150	0.082	29.8	0.1180	0.0000	OK
2160 minute summer	22	2220	105.693	0.914	1.9	1.0334	0.0000	SURCHARGED
4320 minute summer	545	2700	105.328	1.151	7.8	1.7391	0.0000	SURCHARGED
15 minute summer	549	1	110.791	0.000	0.0	0.0000	0.0000	OK
60 minute summer	PP5	37	107.234	0.074	10.5	4.4704	0.0000	OK
60 minute summer	PP6	37	110.573	0.073	11.5	5.3483	0.0000	OK
30 minute summer	PP7	20	110.306	0.056	7.8	2.2632	0.0000	OK
30 minute summer	PP8	21	111.413	0.113	17.8	4.8781	0.0000	SURCHARGED
60 minute summer	PP9	37	108.303	0.093	14.7	5.7409	0.0000	OK
30 minute summer	PP11	19	108.284	0.074	9.4	1.9347	0.0000	OK
30 minute summer	PP12	19	108.028	0.078	9.0	1.3107	0.0000	OK
480 minute winter	509	352	101.285	0.085	29.8	0.1218	0.0000	OK
10080 minute summer	550	6420	103.935	0.735	2.4	1.0524	0.0000	SURCHARGED
10080 minute winter	551	7920	108.211	1.233	0.8	1.3941	0.0000	SURCHARGED
30 minute summer	PP13	19	108.791	0.091	8.4	1.3910	0.0000	OK
15 minute summer	PP14	10	110.147	0.047	4.6	0.3309	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)
60 minute summer	PP10	PP10	507	7.6	1.671	0.589	0.0603	
60 minute summer	PP1	PP1	543	7.2	0.992	1.044	0.2595	
15 minute summer	PP2	PP2	529	4.6	1.231	0.048	0.0738	
60 minute summer	PP3	PP3	526	7.8	1.103	0.987	0.1028	
60 minute summer	PP4	PP4	542	8.1	1.117	1.034	0.1874	
15 minute summer	518	18	506	10.1	0.858	0.276	0.2462	
15 minute summer	J6	j6	DBW7	21.3	1.387	0.356	0.5837	
480 minute winter	21	21	EX	29.8	1.825	0.083	0.0947	732.6
2160 minute summer	22	22	DBW4	1.9	0.431	0.010	0.6522	
4320 minute summer	545	45	DBW5	-5.2	0.231	-0.016	0.7594	
15 minute summer	549	49	533	0.0	0.000	0.000	0.0000	
60 minute summer	PP5	PP5	520	6.2	1.056	0.791	0.0383	
60 minute summer	PP6	PP6	516	6.3	1.074	0.797	0.0552	
30 minute summer	PP7	PP7	508	4.3	0.985	0.546	0.0326	
30 minute summer	PP8	PP8	533	8.0	1.105	1.015	0.1134	
60 minute summer	PP9	PP9	540	8.4	1.161	1.028	0.1575	
30 minute summer	PP11	PP11	540	6.6	1.095	0.842	0.0992	
30 minute summer	PP12	PP12	543	7.3	1.134	0.903	0.1197	
480 minute winter	509	9	21	29.8	1.627	0.083	0.0755	
10080 minute summer	550	16.012	DBW6	2.4	0.267	0.006	1.5563	
10080 minute winter	551	551	DBW2	0.8	0.208	0.013	0.4929	
30 minute summer	PP13	12.000	527	6.1	0.855	1.045	0.1276	
15 minute summer	PP14	10.000	525	4.3	1.223	0.426	0.0288	

Results for 10 year Critical Storm Duration. Lowest mass balance: 99.87%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	501	10	110.032	0.057	5.3	0.0797	0.0000	OK
15 minute summer	502	10	110.025	0.130	20.1	0.2137	0.0000	OK
15 minute summer	503	10	109.959	0.133	30.5	0.2070	0.0000	OK
15 minute summer	504	10	109.845	0.175	35.9	0.2413	0.0000	OK
15 minute summer	505	10	110.905	0.041	8.2	0.0538	0.0000	OK
15 minute summer	506	10	110.315	0.074	25.6	0.0937	0.0000	OK
15 minute summer	507	10	109.768	0.134	49.2	0.2063	0.0000	OK
30 minute summer	508	18	109.407	0.122	59.9	0.1852	0.0000	OK
10080 minute summer	DBW7	7200	108.489	1.489	4.3	357.6418	0.0000	SURCHARGED
10080 minute winter	DBW2	8040	108.321	1.366	1.1	159.0266	0.0000	SURCHARGED
15 minute summer	511	10	109.762	0.155	24.9	0.3092	0.0000	OK
15 minute summer	512	10	111.811	0.028	3.0	0.0355	0.0000	OK
15 minute summer	513	10	111.250	0.033	5.3	0.0408	0.0000	OK
15 minute summer	514	10	110.822	0.021	2.1	0.0262	0.0000	OK
15 minute summer	515	10	110.500	0.056	13.2	0.0904	0.0000	OK
30 minute summer	516	18	109.522	0.077	26.3	0.1191	0.0000	OK
1440 minute summer	517	990	106.572	0.572	5.6	0.6991	0.0000	SURCHARGED
1440 minute summer	DBW3	990	106.572	1.167	7.3	74.7339	0.0000	SURCHARGED
15 minute summer	519	10	106.685	0.048	11.4	0.0814	0.0000	OK
30 minute summer	520	18	106.293	0.074	19.8	0.0984	0.0000	OK
2160 minute summer	DBW4	2220	105.872	1.372	2.2	39.8097	0.0000	SURCHARGED
2880 minute summer	DBW5	1860	105.472	1.472	5.9	36.5524	0.0000	SURCHARGED
8640 minute winter	DBW6	5940	104.045	1.445	2.5	61.7618	0.0000	SURCHARGED
15 minute summer	523	10	110.279	0.050	12.0	0.0794	0.0000	OK
15 minute summer	524	10	109.499	0.059	16.7	0.0771	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	501	1	502	5.3	0.339	0.145	0.2530	
15 minute summer	502	2	503	20.0	0.834	0.548	0.3316	
15 minute summer	503	3	504	30.5	1.055	0.556	0.4036	
15 minute summer	504	4	507	35.7	1.228	0.974	0.2065	
15 minute summer	505	5	506	8.2	1.043	0.074	0.1121	
15 minute summer	506	6	J6	25.6	1.823	0.236	0.5846	
15 minute summer	507	7	508	48.8	2.100	0.556	0.2865	
30 minute summer	508	8	DBW7	59.8	2.802	0.537	0.4008	
10080 minute summer	DBW7	Hydro-Brake®	551	0.8				
10080 minute winter	DBW2	Hydro-Brake®	517	0.5				
15 minute summer	511	11	547	24.2	0.840	0.662	0.2784	
15 minute summer	512	12	513	3.0	1.083	0.031	0.0426	
15 minute summer	513	13	511	5.3	0.346	0.047	0.5807	
15 minute summer	514	14	515	2.1	0.460	0.019	0.0379	
15 minute summer	515	15	516	13.2	1.379	0.138	0.2948	
30 minute summer	516	16	517	26.4	2.261	0.237	0.3236	
1440 minute summer	517	17	DBW3	5.4	0.453	0.028	1.4152	
1440 minute summer	DBW3	Hydro-Brake®	22	2.1				
15 minute summer	519	19	520	11.4	1.384	0.102	0.0799	
30 minute summer	520	20	545	19.7	1.778	0.221	0.2888	
2160 minute summer	DBW4	Hydro-Brake®	545	1.8				
2880 minute summer	DBW5	Hydro-Brake®	550	2.5				
8640 minute winter	DBW6	Hydro-Brake®	509	2.2				
15 minute summer	523	23	524	12.0	1.635	0.108	0.1276	
15 minute summer	524	24	525	16.7	1.540	0.150	0.1183	

Results for 10 year Critical Storm Duration. Lowest mass balance: 99.87%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	525	10	109.032	0.084	30.8	0.1278	0.0000	OK
15 minute summer	526	10	108.424	0.093	39.1	0.1167	0.0000	OK
15 minute summer	527	10	107.735	0.127	59.4	0.2264	0.0000	OK
15 minute summer	528	10	106.877	0.139	78.4	0.2794	0.0000	OK
15 minute summer	529	10	106.433	0.182	98.2	0.3496	0.0000	OK
15 minute summer	530	11	106.218	0.341	108.5	0.7068	0.0000	OK
15 minute summer	531	11	106.146	0.342	110.9	0.5882	0.0000	OK
15 minute summer	532	11	106.065	0.322	120.2	0.5816	0.0000	OK
15 minute summer	533	10	109.665	0.193	40.0	0.2560	0.0000	OK
15 minute summer	534	11	109.064	0.293	64.4	0.5966	0.0000	SURCHARGED
15 minute summer	535	10	109.663	0.038	6.9	0.0555	0.0000	OK
15 minute summer	536	10	109.255	0.083	17.5	0.1368	0.0000	OK
15 minute summer	537	9	108.969	0.069	19.9	0.0861	0.0000	OK
15 minute summer	538	11	108.911	0.280	91.9	0.4479	0.0000	SURCHARGED
15 minute summer	539	11	108.320	0.474	93.1	0.6396	0.0000	SURCHARGED
30 minute summer	540	18	107.791	0.471	112.0	0.7085	0.0000	SURCHARGED
30 minute summer	541	18	107.110	0.275	14.5	0.5143	0.0000	SURCHARGED
15 minute summer	542	11	107.073	0.524	132.6	0.6049	0.0000	SURCHARGED
15 minute summer	543	11	104.797	0.339	272.5	0.5170	0.0000	OK
360 minute summer	DBW1	248	103.764	1.264	112.9	338.6785	0.0000	SURCHARGED
240 minute summer	EX	280	100.952	0.072	29.8	0.0000	0.0000	OK
15 minute summer	547	10	109.715	0.156	26.0	0.1866	0.0000	OK
60 minute summer	510	63	102.536	0.073	28.0	0.1046	0.0000	OK
15 minute summer	544	10	109.578	0.147	46.3	0.1985	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	525	25	526	30.8	2.126	0.277	0.1965	
15 minute summer	526	26	527	38.8	2.025	0.349	0.3051	
15 minute summer	527	27	528	58.9	2.706	0.529	0.3804	
15 minute summer	528	28	529	78.2	2.036	0.390	0.5793	
15 minute summer	529	29	530	97.2	1.969	0.485	0.5092	
15 minute summer	530	30	531	105.2	1.016	0.916	2.3018	
15 minute summer	531	31	532	110.6	1.072	0.963	1.8734	
15 minute summer	532	32	543	121.4	1.329	1.056	1.6187	
15 minute summer	533	33	544	39.8	1.246	1.088	0.2615	
15 minute summer	534	34	538	62.3	1.809	0.834	0.2706	
15 minute summer	535	35	536	6.9	0.803	0.062	0.0885	
15 minute summer	536	36	537	17.5	1.474	0.260	0.1945	
15 minute summer	537	37	538	19.9	0.972	0.208	0.1965	
15 minute summer	538	38	539	87.7	2.404	0.787	0.6864	
15 minute summer	539	39	540	88.4	2.223	0.927	0.5384	
30 minute summer	540	40	542	112.6	1.607	1.765	1.4709	
30 minute summer	541	41	542	13.8	0.500	0.377	1.6767	
15 minute summer	542	42	543	131.5	1.868	2.062	0.9834	
15 minute summer	543	43	DBW1	269.6	2.836	0.896	1.9341	
360 minute summer	DBW1	Hydro-Brake®	510	28.0				
15 minute summer	547	47	533	25.4	0.769	0.693	0.5678	
60 minute summer	510	10	509	28.0	1.914	0.078	0.2860	
15 minute summer	544	44	534	47.1	1.660	0.757	1.3445	

Results for 10 year Critical Storm Duration. Lowest mass balance: 99.87%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute summer	PP10	36	111.335	0.065	13.9	5.4950	0.0000	OK
60 minute summer	PP1	40	107.687	0.137	21.7	11.0768	0.0000	SURCHARGED
15 minute summer	PP2	11	107.937	0.037	6.0	0.6018	0.0000	OK
60 minute summer	PP3	38	109.603	0.103	15.9	6.7360	0.0000	FLOOD RISK
60 minute summer	PP4	40	108.102	0.142	26.8	14.6136	0.0000	SURCHARGED
15 minute summer	518	10	110.435	0.090	11.6	0.1519	0.0000	OK
15 minute summer	J6	10	108.602	0.102	25.6	0.1155	0.0000	OK
240 minute summer	21	280	101.150	0.082	29.8	0.1180	0.0000	OK
2160 minute summer	22	2220	105.872	1.093	2.0	1.2365	0.0000	SURCHARGED
2880 minute summer	545	1860	105.472	1.295	3.8	1.9569	0.0000	SURCHARGED
15 minute summer	549	1	110.791	0.000	0.0	0.0000	0.0000	OK
60 minute summer	PP5	37	107.244	0.084	12.2	5.0847	0.0000	OK
60 minute summer	PP6	37	110.583	0.083	13.4	6.0711	0.0000	OK
30 minute summer	PP7	20	110.313	0.063	9.0	2.5322	0.0000	OK
30 minute summer	PP8	21	111.436	0.136	20.7	5.8693	0.0000	SURCHARGED
60 minute summer	PP9	38	108.323	0.112	17.1	6.9297	0.0000	SURCHARGED
30 minute summer	PP11	19	108.294	0.084	10.9	2.1921	0.0000	OK
30 minute summer	PP12	19	108.039	0.089	10.4	1.4966	0.0000	OK
240 minute summer	509	280	101.285	0.085	29.8	0.1218	0.0000	OK
8640 minute winter	550	5940	104.045	0.845	2.4	1.2091	0.0000	SURCHARGED
10080 minute winter	551	8040	108.321	1.343	0.8	1.5191	0.0000	SURCHARGED
30 minute summer	PP13	20	108.810	0.110	9.7	1.6712	0.0000	SURCHARGED
15 minute summer	PP14	10	110.151	0.051	5.3	0.3613	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)
60 minute summer	PP10	PP10	507	9.0	1.728	0.693	0.0687	607.4
60 minute summer	PP1	PP1	543	7.4	0.993	1.067	0.2604	
15 minute summer	PP2	PP2	529	5.4	1.288	0.056	0.0826	
60 minute summer	PP3	PP3	526	8.0	1.103	1.011	0.1067	
60 minute summer	PP4	PP4	542	8.2	1.118	1.042	0.1879	
15 minute summer	518	18	506	11.6	0.889	0.317	0.2726	
15 minute summer	J6	j6	DBW7	24.7	1.439	0.412	0.6514	
240 minute summer	21	21	EX	29.8	1.825	0.083	0.0947	
2160 minute summer	22	22	DBW4	2.0	0.431	0.010	0.6522	
2880 minute summer	545	45	DBW5	5.9	0.235	0.018	0.7594	
15 minute summer	549	49	533	0.0	0.000	0.000	0.0000	
60 minute summer	PP5	PP5	520	7.2	1.073	0.908	0.0432	
60 minute summer	PP6	PP6	516	7.2	1.091	0.915	0.0623	
30 minute summer	PP7	PP7	508	5.1	1.021	0.646	0.0372	
30 minute summer	PP8	PP8	533	8.2	1.101	1.044	0.1138	
60 minute summer	PP9	PP9	540	8.4	1.161	1.028	0.1596	
30 minute summer	PP11	PP11	540	7.6	1.107	0.961	0.1166	
30 minute summer	PP12	PP12	543	8.1	1.137	1.011	0.1381	
240 minute summer	509	9	21	29.8	1.627	0.083	0.0755	
8640 minute winter	550	16.012	DBW6	2.4	0.404	0.006	1.5563	
10080 minute winter	551	551	DBW2	0.8	0.211	0.013	0.4929	
30 minute summer	PP13	12.000	527	6.3	0.852	1.089	0.1315	
15 minute summer	PP14	10.000	525	5.0	1.268	0.493	0.0321	

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.87%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	501	10	110.053	0.077	6.8	0.1076	0.0000	OK
15 minute summer	502	10	110.049	0.154	25.6	0.2529	0.0000	OK
15 minute summer	503	10	109.983	0.157	38.5	0.2445	0.0000	OK
15 minute summer	504	10	109.892	0.222	45.0	0.3066	0.0000	OK
15 minute summer	505	10	110.910	0.046	10.4	0.0604	0.0000	OK
15 minute summer	506	10	110.325	0.084	32.5	0.1063	0.0000	OK
30 minute summer	507	18	109.793	0.159	61.9	0.2444	0.0000	OK
30 minute summer	508	18	109.429	0.144	76.9	0.2184	0.0000	OK
10080 minute summer	DBW7	7440	108.764	1.764	4.7	423.8512	0.0000	SURCHARGED
10080 minute winter	DBW2	9480	108.560	1.605	1.1	186.8104	0.0000	SURCHARGED
15 minute summer	511	11	109.838	0.231	31.6	0.4611	0.0000	SURCHARGED
15 minute summer	512	10	111.814	0.031	3.8	0.0398	0.0000	OK
15 minute summer	513	10	111.254	0.037	6.7	0.0457	0.0000	OK
15 minute summer	514	10	110.824	0.024	2.7	0.0296	0.0000	OK
15 minute summer	515	10	110.508	0.064	16.8	0.1022	0.0000	OK
15 minute summer	516	10	109.533	0.088	34.4	0.1371	0.0000	OK
1440 minute summer	517	1020	106.895	0.895	6.7	1.0950	0.0000	SURCHARGED
1440 minute summer	DBW3	1020	106.895	1.490	8.7	95.4728	0.0000	SURCHARGED
15 minute summer	519	10	106.692	0.054	14.4	0.0915	0.0000	OK
30 minute summer	520	18	106.304	0.085	25.1	0.1123	0.0000	OK
2880 minute summer	DBW4	2820	106.125	1.625	2.2	47.1391	0.0000	SURCHARGED
2880 minute summer	DBW5	1800	105.707	1.707	4.0	42.3861	0.0000	SURCHARGED
8640 minute winter	DBW6	6000	104.182	1.582	2.6	67.6152	0.0000	SURCHARGED
15 minute summer	523	10	110.285	0.056	15.3	0.0900	0.0000	OK
15 minute summer	524	10	109.507	0.066	21.2	0.0873	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	501	1	502	6.8	0.354	0.186	0.3274	
15 minute summer	502	2	503	25.2	0.863	0.689	0.4030	
15 minute summer	503	3	504	38.1	1.088	0.695	0.4861	
15 minute summer	504	4	507	44.0	1.253	1.202	0.2487	
15 minute summer	505	5	506	10.4	1.113	0.093	0.1329	
15 minute summer	506	6	J6	32.5	1.932	0.300	0.7003	
30 minute summer	507	7	508	61.9	2.180	0.705	0.3496	
30 minute summer	508	8	DBW7	76.7	2.957	0.689	0.4871	
10080 minute summer	DBW7	Hydro-Brake®	551	0.8				
10080 minute winter	DBW2	Hydro-Brake®	517	0.6				
15 minute summer	511	11	547	27.7	0.858	0.758	0.3787	
15 minute summer	512	12	513	3.8	1.161	0.040	0.0503	
15 minute summer	513	13	511	6.7	0.351	0.060	0.7744	
15 minute summer	514	14	515	2.7	0.496	0.024	0.0450	
15 minute summer	515	15	516	16.8	1.460	0.176	0.3546	
15 minute summer	516	16	517	33.9	2.413	0.305	0.3899	
1440 minute summer	517	17	DBW3	6.5	0.416	0.034	1.4152	
1440 minute summer	DBW3	Hydro-Brake®	22	2.1				
15 minute summer	519	19	520	14.4	1.453	0.129	0.0960	
30 minute summer	520	20	545	25.2	1.897	0.282	0.3451	
2880 minute summer	DBW4	Hydro-Brake®	545	1.9				
2880 minute summer	DBW5	Hydro-Brake®	550	2.7				
8640 minute winter	DBW6	Hydro-Brake®	509	2.3				
15 minute summer	523	23	524	15.3	1.747	0.137	0.1522	
15 minute summer	524	24	525	21.2	1.632	0.190	0.1417	

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.87%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	525	10	109.044	0.097	39.1	0.1466	0.0000	OK
15 minute summer	526	10	108.439	0.107	49.8	0.1354	0.0000	OK
15 minute summer	527	10	107.756	0.148	74.5	0.2653	0.0000	OK
15 minute summer	528	10	106.901	0.163	98.8	0.3269	0.0000	OK
15 minute summer	529	11	106.579	0.328	124.1	0.6295	0.0000	SURCHARGED
15 minute summer	530	11	106.399	0.522	130.2	1.0824	0.0000	SURCHARGED
15 minute summer	531	11	106.268	0.464	137.7	0.7986	0.0000	SURCHARGED
15 minute summer	532	11	106.141	0.398	150.7	0.7190	0.0000	SURCHARGED
15 minute summer	533	11	109.777	0.305	45.3	0.4054	0.0000	SURCHARGED
15 minute summer	534	11	109.371	0.600	76.1	1.2216	0.0000	SURCHARGED
15 minute summer	535	10	109.668	0.043	8.8	0.0624	0.0000	OK
15 minute summer	536	9	109.266	0.094	22.2	0.1538	0.0000	OK
15 minute summer	537	11	109.220	0.321	26.2	0.3974	0.0000	SURCHARGED
15 minute summer	538	11	109.201	0.570	97.6	0.9117	0.0000	SURCHARGED
15 minute summer	539	11	108.498	0.652	97.5	0.8801	0.0000	SURCHARGED
15 minute summer	540	11	107.855	0.535	123.3	0.8048	0.0000	SURCHARGED
15 minute summer	541	11	107.205	0.370	19.5	0.6928	0.0000	SURCHARGED
15 minute summer	542	11	107.160	0.611	148.8	0.7053	0.0000	SURCHARGED
15 minute summer	543	11	105.105	0.647	321.5	0.9857	0.0000	SURCHARGED
480 minute summer	DBW1	344	104.229	1.729	118.7	463.3505	0.0000	SURCHARGED
720 minute winter	EX	375	100.952	0.072	29.8	0.0000	0.0000	OK
15 minute summer	547	11	109.817	0.258	30.0	0.3085	0.0000	SURCHARGED
60 minute summer	510	127	102.536	0.073	28.0	0.1046	0.0000	OK
15 minute summer	544	11	109.710	0.279	54.5	0.3764	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	525	25	526	39.1	2.230	0.351	0.2375	
15 minute summer	526	26	527	49.6	2.130	0.445	0.3693	
15 minute summer	527	27	528	74.0	2.834	0.664	0.4563	
15 minute summer	528	28	529	98.3	2.042	0.491	0.8091	
15 minute summer	529	29	530	118.4	1.976	0.591	0.6528	
15 minute summer	530	30	531	131.7	1.194	1.146	2.4102	
15 minute summer	531	31	532	138.5	1.256	1.205	2.0042	
15 minute summer	532	32	543	151.5	1.434	1.318	1.7928	
15 minute summer	533	33	544	44.9	1.196	1.225	0.3267	
15 minute summer	534	34	538	69.1	1.737	0.924	0.2706	
15 minute summer	535	35	536	8.8	0.881	0.079	0.1036	
15 minute summer	536	36	537	23.1	1.540	0.344	0.4322	
15 minute summer	537	37	538	24.1	0.986	0.252	0.3173	
15 minute summer	538	38	539	91.9	2.438	0.825	0.6864	
15 minute summer	539	39	540	96.7	2.432	1.015	0.5384	
15 minute summer	540	40	542	123.0	1.749	1.929	1.4896	
15 minute summer	541	41	542	16.9	0.548	0.462	1.6767	
15 minute summer	542	42	543	148.9	2.115	2.335	0.9932	
15 minute summer	543	43	DBW1	321.8	2.917	1.069	2.2414	
480 minute summer	DBW1	Hydro-Brake®	510	28.0				
15 minute summer	547	47	533	28.7	0.786	0.784	0.6891	
60 minute summer	510	10	509	28.0	1.914	0.078	0.2860	
15 minute summer	544	44	534	50.6	1.620	0.813	1.6157	

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.87%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
30 minute summer	PP10	20	111.349	0.079	22.7	6.6780	0.0000	OK
60 minute summer	PP1	41	107.734	0.184	27.5	14.8774	0.0000	SURCHARGED
15 minute summer	PP2	10	107.942	0.042	7.7	0.6851	0.0000	OK
60 minute summer	PP3	39	109.639	0.139	20.1	9.0305	0.0000	FLOOD RISK
60 minute summer	PP4	42	108.149	0.189	33.9	19.5171	0.0000	SURCHARGED
15 minute summer	518	10	110.447	0.102	14.7	0.1732	0.0000	OK
10080 minute summer	J6	7440	108.764	0.264	1.0	0.2991	0.0000	SURCHARGED
720 minute winter	21	375	101.150	0.082	29.8	0.1180	0.0000	OK
2880 minute summer	22	2820	106.125	1.346	2.0	1.5222	0.0000	SURCHARGED
2880 minute summer	545	1800	105.707	1.530	4.6	2.3118	0.0000	SURCHARGED
15 minute summer	549	1	110.791	0.000	0.0	0.0000	0.0000	OK
60 minute summer	PP5	38	107.268	0.108	15.5	6.5124	0.0000	SURCHARGED
60 minute summer	PP6	38	110.605	0.105	17.0	7.7431	0.0000	SURCHARGED
30 minute summer	PP7	20	110.327	0.077	11.5	3.0949	0.0000	OK
60 minute summer	PP8	38	111.486	0.186	20.4	8.0203	0.0000	SURCHARGED
60 minute summer	PP9	39	108.364	0.154	21.6	9.4894	0.0000	SURCHARGED
30 minute summer	PP11	20	108.321	0.111	13.9	2.9112	0.0000	SURCHARGED
30 minute summer	PP12	20	108.078	0.128	13.3	2.1403	0.0000	SURCHARGED
720 minute winter	509	375	101.285	0.085	29.8	0.1218	0.0000	OK
8640 minute winter	550	6000	104.182	0.982	2.5	1.4050	0.0000	SURCHARGED
10080 minute winter	551	9480	108.560	1.582	0.8	1.7891	0.0000	SURCHARGED
30 minute summer	PP13	20	108.854	0.154	12.4	2.3494	0.0000	SURCHARGED
15 minute summer	PP14	10	110.160	0.060	6.7	0.4202	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)
30 minute summer	PP10	PP10	507	11.4	1.791	0.880	0.0841	1161.1
60 minute summer	PP1	PP1	543	7.7	0.994	1.111	0.2621	
15 minute summer	PP2	PP2	529	6.9	1.387	0.073	0.0992	
60 minute summer	PP3	PP3	526	8.2	1.102	1.048	0.1073	
60 minute summer	PP4	PP4	542	8.5	1.118	1.083	0.1886	
15 minute summer	518	18	506	14.7	0.948	0.402	0.3240	
10080 minute summer	J6	j6	DBW7	1.0	0.570	0.017	1.5007	
720 minute winter	21	21	EX	29.8	1.825	0.083	0.0947	
2880 minute summer	22	22	DBW4	2.0	0.431	0.010	0.6522	
2880 minute summer	545	45	DBW5	4.0	0.235	0.012	0.7594	
15 minute summer	549	49	533	0.0	0.000	0.000	0.0000	
60 minute summer	PP5	PP5	520	7.7	1.075	0.981	0.0492	
60 minute summer	PP6	PP6	516	7.8	1.093	0.989	0.0713	
30 minute summer	PP7	PP7	508	6.6	1.069	0.838	0.0460	
60 minute summer	PP8	PP8	533	8.7	1.115	1.110	0.1145	
60 minute summer	PP9	PP9	540	8.5	1.161	1.042	0.1601	
30 minute summer	PP11	PP11	540	8.0	1.112	1.016	0.1245	
30 minute summer	PP12	PP12	543	8.2	1.139	1.023	0.1424	
720 minute winter	509	9	21	29.8	1.627	0.083	0.0755	
8640 minute winter	550	16.012	DBW6	2.5	0.405	0.006	1.5563	
10080 minute winter	551	551	DBW2	0.8	0.193	0.013	0.4929	
30 minute summer	PP13	12.000	527	7.0	0.899	1.201	0.1339	
15 minute summer	PP14	10.000	525	6.4	1.339	0.626	0.0386	

Results for 100 year +20% CC Critical Storm Duration. Lowest mass balance: 99.87%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	501	11	110.387	0.412	11.7	0.5724	0.0000	SURCHARGED
15 minute summer	502	11	110.380	0.485	37.2	0.7982	0.0000	SURCHARGED
15 minute summer	503	11	110.303	0.477	53.4	0.7425	0.0000	SURCHARGED
15 minute summer	504	11	110.121	0.451	59.9	0.6229	0.0000	SURCHARGED
15 minute summer	505	10	110.922	0.058	16.2	0.0754	0.0000	OK
15 minute summer	506	10	110.349	0.108	50.7	0.1360	0.0000	OK
15 minute summer	507	11	109.964	0.330	86.8	0.5071	0.0000	SURCHARGED
10080 minute winter	508	9360	109.717	0.432	3.1	0.6574	0.0000	SURCHARGED
10080 minute winter	DBW7	9360	109.717	2.717	4.4	652.7377	0.0000	SURCHARGED
10080 minute summer	DBW2	10320	109.187	2.232	1.5	259.8031	0.0000	SURCHARGED
30 minute summer	511	20	110.857	1.250	46.8	2.4959	0.0000	SURCHARGED
15 minute summer	512	10	111.822	0.039	5.9	0.0496	0.0000	OK
15 minute summer	513	10	111.263	0.046	10.4	0.0567	0.0000	OK
15 minute summer	514	10	110.830	0.030	4.2	0.0365	0.0000	OK
15 minute summer	515	10	110.524	0.080	26.1	0.1285	0.0000	OK
15 minute summer	516	10	109.560	0.115	53.5	0.1785	0.0000	OK
2880 minute summer	517	1980	107.864	1.864	6.3	2.2801	0.0000	SURCHARGED
2880 minute summer	DBW3	1980	107.864	2.459	8.3	157.5535	0.0000	FLOOD RISK
15 minute summer	519	9	106.706	0.069	22.5	0.1165	0.0000	OK
2880 minute summer	520	1860	106.421	0.202	4.0	0.2686	0.0000	OK
4320 minute summer	DBW4	3120	107.043	2.543	2.3	72.6065	0.0000	FLOOD RISK
2880 minute summer	DBW5	1860	106.421	2.421	4.5	60.1142	0.0000	FLOOD RISK
7200 minute summer	DBW6	4980	104.545	1.944	3.2	83.1173	0.0000	SURCHARGED
15 minute summer	523	10	110.300	0.071	23.8	0.1134	0.0000	OK
15 minute summer	524	10	109.526	0.086	33.0	0.1129	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	501	1	502	10.7	0.400	0.292	0.6355	
15 minute summer	502	2	503	33.3	0.853	0.910	0.5483	
15 minute summer	503	3	504	50.8	1.277	0.926	0.5587	
15 minute summer	504	4	507	59.8	1.504	1.633	0.2844	
15 minute summer	505	5	506	16.2	1.248	0.145	0.1836	
15 minute summer	506	6	J6	50.7	2.129	0.468	0.9893	
15 minute summer	507	7	508	87.0	2.219	0.990	0.4663	
10080 minute winter	508	8	DBW7	3.1	1.213	0.028	0.7467	
10080 minute winter	DBW7	Hydro-Brake®	551	1.0				
10080 minute summer	DBW2	Hydro-Brake®	517	0.7				
30 minute summer	511	11	547	29.7	0.852	0.812	0.3787	
15 minute summer	512	12	513	5.9	1.318	0.062	0.0689	
15 minute summer	513	13	511	10.4	0.378	0.093	0.8085	
15 minute summer	514	14	515	4.2	0.561	0.038	0.0617	
15 minute summer	515	15	516	26.1	1.613	0.274	0.4953	
15 minute summer	516	16	517	53.2	2.699	0.478	0.5469	
2880 minute summer	517	17	DBW3	6.2	0.256	0.032	1.4152	
2880 minute summer	DBW3	Hydro-Brake®	22	2.2				
15 minute summer	519	19	520	22.5	1.587	0.202	0.1338	
2880 minute summer	520	20	545	4.0	1.064	0.045	1.0067	
4320 minute summer	DBW4	Hydro-Brake®	545	1.9				
2880 minute summer	DBW5	Hydro-Brake®	550	3.2				
7200 minute summer	DBW6	Hydro-Brake®	509	2.6				
15 minute summer	523	23	524	23.8	1.934	0.214	0.2139	
15 minute summer	524	24	525	33.0	1.811	0.296	0.1977	

Results for 100 year +20% CC Critical Storm Duration. Lowest mass balance: 99.87%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	525	10	109.072	0.125	60.6	0.1884	0.0000	OK
15 minute summer	526	11	108.642	0.311	74.7	0.3913	0.0000	SURCHARGED
15 minute summer	527	11	108.301	0.693	106.8	1.2394	0.0000	SURCHARGED
15 minute summer	528	11	107.502	0.764	138.7	1.5356	0.0000	SURCHARGED
15 minute summer	529	11	107.199	0.948	166.2	1.8191	0.0000	SURCHARGED
15 minute summer	530	11	106.841	0.964	184.6	1.9977	0.0000	FLOOD RISK
15 minute summer	531	11	106.577	0.773	194.7	1.3312	0.0000	SURCHARGED
15 minute summer	532	11	106.320	0.577	214.1	1.0422	0.0000	SURCHARGED
30 minute summer	533	20	110.760	1.287	45.9	1.7123	0.0000	SURCHARGED
30 minute summer	534	20	110.195	1.424	82.3	2.9003	0.0000	FLOOD RISK
30 minute summer	535	20	110.023	0.398	13.0	0.5825	0.0000	SURCHARGED
30 minute summer	536	20	110.019	0.847	32.9	1.3884	0.0000	SURCHARGED
30 minute summer	537	20	109.985	1.086	27.5	1.3455	0.0000	SURCHARGED
30 minute summer	538	20	109.957	1.326	111.5	2.1209	0.0000	FLOOD RISK
30 minute summer	539	19	108.949	1.103	116.9	1.4881	0.0000	SURCHARGED
30 minute summer	540	19	108.024	0.704	146.9	1.0584	0.0000	SURCHARGED
30 minute summer	541	18	107.471	0.636	29.0	1.1897	0.0000	SURCHARGED
15 minute summer	542	11	107.345	0.796	181.5	0.9188	0.0000	SURCHARGED
600 minute summer	543	435	105.778	1.319	134.9	2.0108	0.0000	SURCHARGED
600 minute summer	DBW1	435	105.772	3.272	145.1	805.3817	0.0000	SURCHARGED
600 minute summer	EX	435	100.953	0.073	30.6	0.0000	0.0000	OK
30 minute summer	547	20	110.822	1.263	32.3	1.5120	0.0000	SURCHARGED
600 minute summer	510	435	102.538	0.075	29.0	0.1067	0.0000	OK
30 minute summer	544	20	110.666	1.235	53.7	1.6670	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	525	25	526	60.9	2.415	0.547	0.4097	
15 minute summer	526	26	527	70.5	2.200	0.633	0.6323	
15 minute summer	527	27	528	100.1	2.804	0.899	0.6954	
15 minute summer	528	28	529	130.0	2.032	0.649	1.0638	
15 minute summer	529	29	530	166.2	2.360	0.830	0.6528	
15 minute summer	530	30	531	185.4	1.681	1.613	2.4102	
15 minute summer	531	31	532	195.2	1.770	1.699	2.0042	
15 minute summer	532	32	543	214.7	1.949	1.868	1.9087	
30 minute summer	533	33	544	47.9	1.263	1.307	0.3267	
30 minute summer	534	34	538	75.9	1.908	1.015	0.2706	
30 minute summer	535	35	536	12.9	0.917	0.116	0.3962	
30 minute summer	536	36	537	23.7	1.582	0.353	0.6521	
30 minute summer	537	37	538	25.3	0.945	0.265	0.3173	
30 minute summer	538	38	539	110.3	2.775	0.991	0.6864	
30 minute summer	539	39	540	116.9	2.941	1.227	0.5384	
30 minute summer	540	40	542	146.9	2.086	2.303	1.5143	
30 minute summer	541	41	542	26.7	0.670	0.728	1.6767	
15 minute summer	542	42	543	181.8	2.582	2.850	0.9967	
600 minute summer	543	43	DBW1	135.0	2.484	0.449	2.2430	
600 minute summer	DBW1	Hydro-Brake®	510	29.0				
30 minute summer	547	47	533	29.4	0.742	0.804	0.6891	
600 minute summer	510	10	509	29.0	1.934	0.081	0.2938	
30 minute summer	544	44	534	55.5	1.592	0.892	1.6157	

Results for 100 year +20% CC Critical Storm Duration. Lowest mass balance: 99.87%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute summer	PP10	38	111.402	0.132	27.4	11.1643	0.0000	SURCHARGED
120 minute summer	PP1	78	107.875	0.325	29.9	26.2134	0.0000	FLOOD RISK
15 minute summer	PP2	10	107.954	0.054	11.9	0.8758	0.0000	OK
60 minute summer	PP3	41	109.743	0.243	31.2	15.8062	0.0000	FLOOD RISK
120 minute summer	PP4	80	108.297	0.336	36.9	34.6625	0.0000	FLOOD RISK
15 minute summer	518	10	110.478	0.133	23.0	0.2253	0.0000	OK
10080 minute winter	J6	9360	109.717	1.217	0.9	1.3767	0.0000	SURCHARGED
600 minute summer	21	435	101.151	0.084	30.6	0.1198	0.0000	OK
4320 minute summer	22	3120	107.043	2.264	2.1	2.5608	0.0000	SURCHARGED
2880 minute summer	545	1860	106.421	2.244	6.4	3.3906	0.0000	SURCHARGED
15 minute summer	549	1	110.791	0.000	0.0	0.0000	0.0000	OK
60 minute summer	PP5	39	107.343	0.183	24.0	11.0592	0.0000	SURCHARGED
60 minute summer	PP6	40	110.679	0.179	26.4	13.1829	0.0000	SURCHARGED
30 minute summer	PP7	21	110.373	0.123	18.1	4.9404	0.0000	SURCHARGED
60 minute summer	PP8	40	111.638	0.338	31.8	14.5874	0.0000	FLOOD RISK
60 minute summer	PP9	41	108.488	0.278	33.6	17.1550	0.0000	FLOOD RISK
30 minute summer	PP11	21	108.418	0.208	21.8	5.4244	0.0000	FLOOD RISK
30 minute summer	PP12	21	108.211	0.261	20.8	4.3630	0.0000	FLOOD RISK
600 minute summer	509	435	101.286	0.086	30.6	0.1237	0.0000	OK
7200 minute summer	550	4980	104.545	1.345	3.0	1.9240	0.0000	SURCHARGED
10080 minute summer	551	10320	109.187	2.209	1.0	2.4983	0.0000	SURCHARGED
30 minute summer	PP13	21	108.990	0.290	19.5	4.4167	0.0000	FLOOD RISK
15 minute summer	PP14	10	110.184	0.084	10.4	0.5888	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)
60 minute summer	PP10	PP10	507	13.0	1.798	1.004	0.1023	1190.0
120 minute summer	PP1	PP1	543	8.4	1.077	1.216	0.2647	
15 minute summer	PP2	PP2	529	11.2	1.584	0.117	0.1401	
60 minute summer	PP3	PP3	526	9.4	1.203	1.197	0.1085	
120 minute summer	PP4	PP4	542	9.5	1.214	1.208	0.1903	
15 minute summer	518	18	506	23.0	1.065	0.628	0.4504	
10080 minute winter	J6	j6	DBW7	0.9	0.552	0.015	1.5007	
600 minute summer	21	21	EX	30.6	1.837	0.085	0.0967	
4320 minute summer	22	22	DBW4	2.1	0.446	0.011	0.6522	
2880 minute summer	545	45	DBW5	4.5	0.255	0.014	0.7594	
15 minute summer	549	49	533	0.0	0.000	0.000	0.1564	
60 minute summer	PP5	PP5	520	9.4	1.200	1.191	0.0501	
60 minute summer	PP6	PP6	516	9.0	1.145	1.134	0.0724	
30 minute summer	PP7	PP7	508	8.1	1.079	1.024	0.0568	
60 minute summer	PP8	PP8	533	10.4	1.324	1.319	0.1157	
60 minute summer	PP9	PP9	540	9.5	1.218	1.161	0.1637	
30 minute summer	PP11	PP11	540	8.9	1.134	1.128	0.1259	
30 minute summer	PP12	PP12	543	9.4	1.201	1.166	0.1440	
600 minute summer	509	9	21	30.6	1.635	0.085	0.0772	
7200 minute summer	550	16.012	DBW6	2.9	0.453	0.007	1.5563	
10080 minute summer	551	551	DBW2	1.0	0.138	0.016	0.4929	
30 minute summer	PP13	12.000	527	8.5	1.085	1.459	0.1374	
15 minute summer	PP14	10.000	525	9.7	1.434	0.951	0.0549	

Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	5	Maximum Rainfall (mm/hr)	50.0
Additional Flow (%)	0	Minimum Velocity (m/s)	1.00
FSR Region	Scotland and Ireland	Connection Type	Level Soffits
M5-60 (mm)	18.400	Minimum Backdrop Height (m)	0.200
Ratio-R	0.216	Preferred Cover Depth (m)	1.200
CV	1.000	Include Intermediate Ground	✓
Time of Entry (mins)	4.00	Enforce best practice design rules	x

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
401	0.020	4.00	117.920	1200	711841.278	725643.966	1.709
402	0.005	4.00	116.812	1200	711836.842	725661.533	1.425
403	0.025	4.00	116.407	1200	711812.850	725655.577	1.844
404	0.017	4.00	116.490	1200	711792.604	725631.516	1.425
405	0.055	4.00	115.950	1200	711787.779	725649.287	2.105
406	0.016	4.00	115.550	1200	711771.482	725646.456	2.457
407			113.400	1200	711951.865	725721.914	3.720
408	0.008	4.00	114.500	1200	711731.068	725651.915	1.425
409	0.003	4.00	112.897	1200	711734.961	725672.716	1.425
410	0.078	4.00	113.900	1200	711741.750	725667.782	2.470
DB11	0.120	4.00	111.600		711774.747	725682.184	2.900
412	0.022	4.00	118.350	1200	711889.362	725653.526	1.730
413	0.034	4.00	116.903	1200	711906.232	725686.882	1.603
414	0.028	4.00	117.140	1200	711883.369	725680.613	1.959
415	0.065	4.00	116.898	1200	711847.984	725664.910	1.350
416	0.017	4.00	117.073	1200	711869.646	725671.318	1.713
417			117.158	1200	711876.887	725678.810	3.377
418	0.054	4.00	114.588	1200	711867.190	725688.331	2.188
419	0.011	4.00	113.811	1200	711863.773	725699.364	1.936
420	0.009	4.00	112.916	1200	711813.710	725687.324	1.714
DB21	0.053	4.00	112.112		711839.714	725697.580	4.502
422	0.034	4.00	117.624	1200	711938.829	725671.353	1.596
423	0.033	4.00	116.076	1200	711948.635	725700.923	1.425
424	0.027	4.00	116.444	1200	711933.968	725697.064	1.869
425	0.012	4.00	116.688	1200	711921.815	725693.712	3.188
426	0.043	4.00	113.782	1200	711909.931	725705.483	1.042
427	0.009	4.00	113.557	1200	711907.374	725715.728	1.297
DB28	0.051	4.00	113.300		711889.192	725718.827	4.765
429	0.021	4.00	116.250	1200	711991.981	725682.653	1.425
430	0.031	4.00	115.785	1200	711959.852	725703.934	1.425
431	0.035	4.00	114.820	1200	711984.169	725710.311	2.820
432	0.003	4.00	112.762	1350	711913.252	725726.230	5.479
DB33	0.085	4.00	113.410		711950.404	725720.163	2.835
outfall			110.000		712019.748	725802.231	3.289
411			114.600	1350	711992.589	725722.845	7.609
DB34			112.100		711951.788	725726.013	3.425
433			113.400	1200	711859.213	725703.684	5.823
434			112.100	1350	711893.186	725732.515	4.747
435			112.700	1350	711941.845	725722.907	5.513
436			111.300	1350	711944.951	725732.612	4.147
PPSW1	0.030	4.00	115.000		711979.630	725702.486	0.500

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
PPSW2	0.073	4.00	117.000		711932.097	725690.058	0.500
PPSW3	0.060	4.00	118.000		711880.047	725668.877	0.500
PPSW4	0.053	4.00	117.500		711834.272	725656.823	0.500
PPSW5	0.124	4.00	114.500		711746.076	725656.771	0.500
PPSW6	0.018	4.00	116.000		711791.821	725656.388	0.500
PPSW7	0.010	4.00	114.000		711754.006	725666.106	0.500
PPSW8	0.009	4.00	117.500		711891.091	725687.010	1.000

Links

Name	US Node	DS Node	Length (m)	US IL (m)	DS IL (m)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1	401	402	18.118	116.211	115.387	225	4.11	50.0
2	402	403	24.720	115.387	114.563	225	4.28	50.0
3	403	405	25.848	114.563	113.845	225	4.48	50.0
4	404	405	18.414	115.065	114.451	225	4.13	50.0
5	405	406	16.541	113.845	113.093	225	4.58	50.0
6	406	410	36.589	113.093	111.430	225	4.79	50.0
18.002	DB33	407	2.280	110.575	110.564	225	4.43	50.0
8	408	410	19.128	113.075	112.475	225	4.14	50.0
9	409	410	8.393	111.472	111.430	225	4.15	50.0
10	410	DB11	36.003	111.430	109.793	225	5.01	50.0
DB11	DB11	DB21	35.000	108.700	107.610	300	5.22	50.0
12	412	414	27.742	116.620	115.359	225	4.17	50.0
13	413	414	23.707	115.300	115.181	225	4.43	50.0
14	414	417	6.728	115.181	115.147	225	4.55	50.0
15	415	416	22.590	115.548	115.435	150	4.53	50.0
16	416	417	10.419	115.360	115.147	150	4.65	50.0
17	417	418	13.590	113.781	113.163	225	4.73	50.0
18	418	419	11.550	112.400	111.875	225	4.80	50.0

Name	Vel (m/s)	Cap (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)
1	2.802	111.4	1.484	1.200	0.020
2	2.397	95.3	1.200	1.619	0.078
3	2.187	87.0	1.619	1.880	0.103
4	2.397	95.3	1.200	1.274	0.017
5	2.801	111.4	1.880	2.232	0.193
6	2.801	111.4	2.232	2.245	0.209
18.002	0.921	36.6	2.610	2.611	0.202
8	2.325	92.4	1.200	1.200	0.008
9	0.921	36.6	1.200	2.245	0.003
10	2.801	111.4	2.245	1.582	0.433
DB11	2.784	196.8	2.600	4.202	0.552
12	2.801	111.4	1.505	1.556	0.022
13	0.921	36.6	1.378	1.734	0.034
14	0.921	36.6	1.734	1.786	0.153
15	0.707	12.5	1.200	1.488	0.065
16	1.442	25.5	1.563	1.861	0.082
17	2.802	111.4	3.152	1.200	0.235
18	2.801	111.4	1.963	1.711	0.289

Links

Name	US Node	DS Node	Length (m)	US IL (m)	DS IL (m)	Dia (mm)	T of C (mins)	Rain (mm/hr)
19	419	DB21	24.125	111.875	110.778	225	4.95	50.0
20	420	DB21	27.953	111.202	109.931	225	4.17	50.0
DB21	DB21	433	10.000	107.610	107.577	300	5.40	50.0
22	422	424	26.166	116.028	115.019	225	4.17	50.0
23	423	424	15.166	114.651	114.575	225	4.27	50.0
24	424	425	12.607	114.575	114.512	225	4.50	50.0
25	425	426	16.727	113.500	112.740	225	4.60	50.0
26	426	427	10.559	112.740	112.260	225	4.67	50.0
27	427	DB28	18.444	112.260	111.422	225	4.77	50.0
DB28	DB28	434	14.259	108.535	108.487	300	5.04	50.0
29	429	431	28.740	114.825	113.395	225	4.16	50.0
30	430	431	25.139	114.360	113.395	225	4.16	50.0
31	431	DB33	35.173	112.000	110.575	225	4.39	50.0
32	432	435	28.785	107.283	107.187	375	7.02	50.0
DB33	DB34	411	40.924	108.675	108.470	225	5.19	50.0
1.013	411	outfall	83.903	106.991	106.711	375	9.31	48.3
18.003	407	DB34	4.100	109.680	109.500	225	4.45	50.0
1.008	433	434	44.558	107.577	107.428	300	6.22	50.0
1.009	434	432	21.027	107.353	107.283	375	6.56	50.0
1.011	435	436	10.190	107.187	107.153	375	7.19	50.0
436	436	411	48.629	107.153	106.991	375	7.96	50.0
20.000	PPSW1	431	9.046	114.500	114.144	100	4.10	50.0
17.000	PPSW2	424	7.252	116.500	115.942	100	4.06	50.0
11.000	PPSW3	414	12.197	117.500	116.562	100	4.09	50.0

Name	Vel (m/s)	Cap (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)
19	2.801	111.4	1.711	1.109	0.300
20	2.801	111.4	1.489	1.956	0.009
DB21	0.902	63.8	4.202	5.523	0.915
22	2.579	102.6	1.371	1.200	0.034
23	0.921	36.6	1.200	1.644	0.033
24	0.921	36.6	1.644	1.951	0.166
25	2.801	111.4	2.963	0.817	0.178
26	2.801	111.4	0.817	1.072	0.222
27	2.801	111.4	1.072	1.653	0.231
DB28	0.902	63.8	4.465	3.313	0.282
29	2.932	116.6	1.200	1.200	0.021
30	2.573	102.3	1.200	1.200	0.031
31	2.644	105.1	2.595	2.610	0.117
32	1.041	114.9	5.104	5.138	1.199
DB33	0.921	36.6	3.200	5.905	0.202
1.013	1.041	114.9	7.234	2.914	1.401
18.003	2.753	109.5	3.495	2.375	0.202
1.008	0.902	63.8	5.523	4.372	0.915
1.009	1.041	114.9	4.372	5.104	1.196
1.011	1.041	114.9	5.138	3.772	1.199
436	1.041	114.9	3.772	7.234	1.199
20.000	1.537	12.1	0.400	0.576	0.030
17.000	2.154	16.9	0.400	0.402	0.073
11.000	2.154	16.9	0.400	0.478	0.060

Links

Name	US Node	DS Node	Length (m)	US IL (m)	DS IL (m)	Dia (mm)	T of C (mins)	Rain (mm/hr)
2.000	PPSW4	402	5.366	117.000	116.587	100	4.04	50.0
7.000	PPSW5	410	11.830	114.000	113.090	100	4.09	50.0
4.000	PPSW6	405	8.171	115.500	115.354	100	4.13	50.0
6.000	PPSW7	410	12.370	113.500	113.292	100	4.21	50.0
12.000	PPSW8	414	10.028	116.500	116.331	100	4.17	50.0

Name	Vel (m/s)	Cap (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)
2.000	2.154	16.9	0.400	0.125	0.053
7.000	2.154	16.9	0.400	0.710	0.124
4.000	1.032	8.1	0.400	0.496	0.018
6.000	1.000	7.9	0.400	0.508	0.010
12.000	1.002	7.9	0.900	0.709	0.009

Simulation Settings

Rainfall Methodology	FSR	Analysis Speed	Normal
Rainfall Events	Singular	Skip Steady State	x
FSR Region	Scotland and Ireland	Drain Down Time (mins)	240
M5-60 (mm)	18.400	Additional Storage (m³/ha)	20.0
Ratio-R	0.216	Starting Level (m)	
Summer CV	1.000	Check Discharge Rate(s)	x
Winter CV	1.000	Check Discharge Volume	x

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 %)
1	0	0	0
5	0	0	0
10	0	0	0
30	0	0	0
100	20	0	0

Node DB11 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	108.700	Product Number	CTL-SHE-0141-1160-2000-1160
Design Depth (m)	2.000	Min Outlet Diameter (m)	0.225
Design Flow (l/s)	11.6	Min Node Diameter (mm)	1500

Node DB21 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	107.610	Product Number	CTL-SHE-0077-4900-3900-4900
Design Depth (m)	3.900	Min Outlet Diameter (m)	0.100
Design Flow (l/s)	4.9	Min Node Diameter (mm)	1200

Node DB28 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	108.535	Product Number	CTL-SHE-0040-1400-3900-1400
Design Depth (m)	3.900	Min Outlet Diameter (m)	0.075
Design Flow (l/s)	1.4	Min Node Diameter (mm)	1200

Node DB33 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	110.575	Product Number	CTL-SHE-0037-1000-2825-1000
Design Depth (m)	2.825	Min Outlet Diameter (m)	0.075
Design Flow (l/s)	1.0	Min Node Diameter (mm)	1200

Node DB34 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	108.675	Product Number	CTL-SHE-0024-5000-3325-5000
Design Depth (m)	3.325	Min Outlet Diameter (m)	0.075
Design Flow (l/s)	0.5	Min Node Diameter (mm)	1200

Node DB11 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	108.800
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)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	212.0	0.0	2.000	212.0	0.0	2.001	0.0	0.0

Node DB21 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	109.510
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)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	208.0	0.0	2.000	208.0	0.0	2.001	0.0	0.0

Node DB21 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	107.610
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.30	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	2.8	0.0	0.401	210.0	0.0	1.901	0.0	0.0
0.400	2.8	0.0	1.900	210.0	0.0			

Node DB28 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	110.705
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	

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	120.0	0.0	2.000	120.0	0.0	2.001	0.0	0.0

Node DB28 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	108.535
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.30	Time to half empty (mins)	

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	2.8	0.0	0.401	140.0	0.0	1.901	0.0	0.0
0.400	2.8	0.0	1.900	140.0	0.0			

Node DB33 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	111.900
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	

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	123.0	0.0	1.500	123.0	0.0	1.501	0.0	0.0

Node DB33 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	110.575
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.30	Time to half empty (mins)	

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	0.4	0.0	0.326	114.0	0.0	1.326	0.0	0.0
0.325	0.4	0.0	1.325	114.0	0.0			

Node DB34 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	110.500
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	

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	72.0	0.0	1.500	72.0	0.0	1.501	0.0	0.0

Node DB34 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	108.675
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.30	Time to half empty (mins)	

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	0.4	0.0	0.326	72.0	0.0	1.826	0.0	0.0
0.325	0.4	0.0	1.825	72.0	0.0			

Node PPSW1 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	114.500
Side Inf Coefficient (m/hr)	0.00000	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	86.8	0.0	0.350	86.8	0.0	0.351	0.0	0.0

Node PPSW2 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	116.500
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.30	Time to half empty (mins)	9

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	145.0	0.0	0.350	145.0	0.0	0.351	0.0	0.0

Node PPSW3 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	117.500
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.30	Time to half empty (mins)	7

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	120.0	0.0	0.350	120.0	0.0	0.351	0.0	0.0

Node PPSW4 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	117.000
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.30	Time to half empty (mins)	5

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	96.0	0.0	0.350	96.0	0.0	0.351	0.0	0.0

Node PPSW5 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	114.000
Side Inf Coefficient (m/hr)	0.00000	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	277.0	0.0	0.350	277.0	0.0	0.351	0.0	0.0

Node PPSW6 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	115.500
Side Inf Coefficient (m/hr)	0.00000	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	181.0	0.0	0.350	181.0	0.0	0.351	0.0	0.0

Node PPSW7 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	113.500
Side Inf Coefficient (m/hr)	0.00000	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	102.0	0.0	0.350	102.0	0.0	0.351	0.0	0.0

Node PPSW8 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	116.500
Side Inf Coefficient (m/hr)	0.00000	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	86.0	0.0	0.350	86.0	0.0	0.351	0.0	0.0

Other (defaults)

Entry Loss (manhole)	0.250	Entry Loss (junction)	0.000	Apply Recommended Losses	x
Exit Loss (manhole)	0.250	Exit Loss (junction)	0.000	Flood Risk (m)	0.300

Approval Settings

Node Size	✓	Minimum Full Bore Velocity (m/s)	
Node Losses	✓	Maximum Full Bore Velocity (m/s)	3.000
Link Size	✓	Proportional Velocity	✓
Minimum Diameter (mm)	150	Return Period (years)	
Link Length	✓	Minimum Proportional Velocity (m/s)	0.750
Maximum Length (m)	100.000	Maximum Proportional Velocity (m/s)	3.000
Coordinates	✓	Surcharged Depth	✓
Accuracy (m)	1.000	Return Period (years)	
Crossings	✓	Maximum Surcharged Depth (m)	0.100
Cover Depth	✓	Flooding	✓
Minimum Cover Depth (m)		Return Period (years)	30
Maximum Cover Depth (m)	3.000	Time to Half Empty	x
Backdrops	✓	Discharge Rates	✓
Minimum Backdrop Height (m)		Discharge Volume	✓
Maximum Backdrop Height (m)	1.500	100 year 360 minute (m ³)	
Full Bore Velocity	✓		

Results for 1 year Critical Storm Duration. Lowest mass balance: 99.42%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	401	10	116.238	0.027	3.3	0.0363	0.0000	OK
30 minute summer	402	18	115.437	0.050	10.5	0.0599	0.0000	OK
30 minute summer	403	18	114.624	0.061	14.1	0.0853	0.0000	OK
15 minute summer	404	10	115.092	0.027	2.9	0.0375	0.0000	OK
30 minute summer	405	18	113.921	0.076	25.3	0.1252	0.0000	OK
30 minute summer	406	18	113.169	0.076	27.7	0.0961	0.0000	OK
8640 minute winter	407	7740	110.958	1.278	0.7	1.4449	0.0000	SURCHARGED
15 minute summer	408	10	113.094	0.019	1.3	0.0234	0.0000	OK
30 minute summer	409	18	111.538	0.066	0.5	0.0775	0.0000	OK
30 minute summer	410	18	111.538	0.108	51.1	0.1907	0.0000	OK
2880 minute summer	DB11	1920	109.594	0.894	8.4	169.2636	0.0000	SURCHARGED
15 minute summer	412	10	116.648	0.028	3.7	0.0394	0.0000	OK
15 minute summer	413	10	115.359	0.059	5.6	0.0913	0.0000	OK
30 minute summer	414	18	115.312	0.131	20.2	0.1852	0.0000	OK
15 minute summer	415	10	115.659	0.111	10.8	0.2326	0.0000	OK
15 minute summer	416	10	115.443	0.083	13.4	0.1111	0.0000	OK
30 minute summer	417	18	113.870	0.089	32.6	0.1011	0.0000	OK
15 minute summer	418	10	112.503	0.103	40.9	0.1671	0.0000	OK
15 minute summer	419	11	111.973	0.098	42.5	0.1218	0.0000	OK
15 minute summer	420	10	111.220	0.018	1.5	0.0226	0.0000	OK
2880 minute summer	DB21	1920	109.534	1.924	8.0	100.3374	0.0000	SURCHARGED
15 minute summer	422	10	116.064	0.036	5.6	0.0563	0.0000	OK
30 minute summer	423	18	114.712	0.061	5.2	0.0966	0.0000	OK
30 minute summer	424	18	114.709	0.134	21.9	0.1897	0.0000	OK
30 minute summer	425	18	113.571	0.070	23.5	0.0850	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	401	1	402	3.3	0.868	0.030	0.0802	
30 minute summer	402	2	403	10.4	1.374	0.109	0.1878	
30 minute summer	403	3	405	14.0	1.389	0.161	0.2636	
15 minute summer	404	4	405	2.9	1.074	0.030	0.0497	
30 minute summer	405	5	406	25.3	2.147	0.227	0.1948	
30 minute summer	406	6	410	27.7	1.816	0.249	0.5605	
8640 minute winter	407	18.003	DB34	0.7	0.682	0.007	0.1631	
15 minute summer	408	8	410	1.3	0.827	0.014	0.0299	
30 minute summer	409	9	410	0.5	0.046	0.014	0.1200	
30 minute summer	410	10	DB11	50.5	2.720	0.453	0.6684	
2880 minute summer	DB11	Hydro-Brake®	DB21	4.8				
15 minute summer	412	12	414	3.7	1.291	0.033	0.0793	
15 minute summer	413	13	414	5.6	0.381	0.152	0.3719	
30 minute summer	414	14	417	20.0	0.895	0.547	0.1504	
15 minute summer	415	15	416	10.5	0.816	0.843	0.2907	
15 minute summer	416	16	417	13.3	1.391	0.522	0.0997	
30 minute summer	417	17	418	32.6	2.330	0.292	0.1899	
15 minute summer	418	18	419	40.7	2.377	0.365	0.1977	
15 minute summer	419	19	DB21	42.4	2.594	0.380	0.3942	
15 minute summer	420	20	DB21	1.5	0.985	0.013	0.0422	
2880 minute summer	DB21	Hydro-Brake®	433	3.5				
15 minute summer	422	22	424	5.6	1.378	0.055	0.1063	
30 minute summer	423	23	424	5.1	0.338	0.139	0.2523	
30 minute summer	424	24	425	21.7	0.929	0.592	0.2942	
30 minute summer	425	25	426	23.4	1.926	0.210	0.2053	

Results for 1 year Critical Storm Duration. Lowest mass balance: 99.42%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
30 minute summer	426	18	112.826	0.086	29.9	0.1689	0.0000	OK
30 minute summer	427	18	112.344	0.084	31.4	0.1065	0.0000	OK
2160 minute summer	DB28	1440	110.924	2.389	5.1	90.1269	0.0000	SURCHARGED
15 minute summer	429	10	114.852	0.027	3.5	0.0386	0.0000	OK
15 minute summer	430	10	114.395	0.035	5.1	0.0540	0.0000	OK
2880 minute summer	431	1920	112.112	0.112	1.8	0.1546	0.0000	OK
2880 minute summer	432	1920	107.334	0.051	4.6	0.0739	0.0000	OK
2880 minute summer	DB33	1920	112.112	1.537	3.1	61.3027	0.0000	SURCHARGED
4320 minute summer	outfall	2820	106.761	0.050	5.0	0.0000	0.0000	OK
4320 minute summer	411	2820	107.045	0.053	5.0	0.0765	0.0000	OK
8640 minute winter	DB34	7740	110.958	2.283	0.7	65.4184	0.0000	SURCHARGED
2880 minute summer	433	1920	107.626	0.049	3.5	0.0550	0.0000	OK
2880 minute summer	434	1920	107.405	0.052	4.6	0.0745	0.0000	OK
2880 minute summer	435	1920	107.240	0.053	4.6	0.0760	0.0000	OK
2880 minute summer	436	1920	107.204	0.051	4.6	0.0727	0.0000	OK
30 minute summer	PPSW1	19	114.538	0.038	4.8	1.0382	0.0000	OK
30 minute summer	PPSW2	19	116.553	0.053	11.5	2.4373	0.0000	OK
30 minute summer	PPSW3	19	117.548	0.048	9.6	1.8349	0.0000	OK
30 minute summer	PPSW4	19	117.047	0.047	8.4	1.4392	0.0000	OK
30 minute summer	PPSW5	20	114.062	0.062	19.6	5.4530	0.0000	OK
120 minute summer	PPSW6	70	115.525	0.025	1.7	1.3653	0.0000	OK
60 minute summer	PPSW7	37	113.520	0.020	1.3	0.6301	0.0000	OK
60 minute summer	PPSW8	37	116.520	0.019	1.1	0.5059	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)
30 minute summer	426	26	427	30.0	2.192	0.269	0.1443	
30 minute summer	427	27	DB28	31.3	2.383	0.281	0.2426	
2160 minute summer	DB28	Hydro-Brake®	434	1.1				
15 minute summer	429	29	431	3.5	1.311	0.030	0.0766	
15 minute summer	430	30	431	5.1	1.338	0.050	0.0957	
2880 minute summer	431	31	DB33	1.8	0.095	0.017	1.0465	
2880 minute summer	432	32	435	4.6	0.501	0.040	0.2668	
2880 minute summer	DB33	Hydro-Brake®	407	0.8				
4320 minute summer	411	1.013	outfall	5.0	0.549	0.044	0.7656	956.1
8640 minute winter	DB34	DB33	411	0.4	0.326	0.012	0.0532	
2880 minute summer	433	1.008	434	3.5	0.513	0.055	0.3065	
2880 minute summer	434	1.009	432	4.6	0.508	0.040	0.1919	
2880 minute summer	435	1.011	436	4.6	0.504	0.040	0.0937	
2880 minute summer	436	436	411	4.6	0.503	0.040	0.4488	
30 minute summer	PPSW1	20.000	431	3.6	1.319	0.295	0.0244	
30 minute summer	PPSW2	17.000	424	8.6	2.106	0.505	0.0295	
30 minute summer	PPSW3	11.000	414	7.5	2.058	0.443	0.0444	
30 minute summer	PPSW4	2.000	402	6.9	1.985	0.407	0.0186	
30 minute summer	PPSW5	7.000	410	11.3	2.263	0.669	0.0591	
120 minute summer	PPSW6	4.000	405	1.1	0.709	0.131	0.0122	
60 minute summer	PPSW7	6.000	410	0.7	0.617	0.089	0.0140	
60 minute summer	PPSW8	12.000	414	0.6	0.602	0.081	0.0107	

Results for 5 year Critical Storm Duration. Lowest mass balance: 99.42%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	401	10	116.243	0.032	5.0	0.0443	0.0000	OK
30 minute summer	402	18	115.449	0.062	16.1	0.0745	0.0000	OK
30 minute summer	403	18	114.639	0.076	21.6	0.1064	0.0000	OK
15 minute summer	404	10	115.098	0.033	4.4	0.0460	0.0000	OK
15 minute summer	405	10	113.943	0.098	39.8	0.1616	0.0000	OK
15 minute summer	406	10	113.190	0.097	43.4	0.1219	0.0000	OK
10080 minute winter	407	8880	111.235	1.555	0.7	1.7589	0.0000	SURCHARGED
15 minute summer	408	10	113.098	0.023	2.0	0.0287	0.0000	OK
30 minute summer	409	18	111.572	0.100	0.7	0.1165	0.0000	OK
30 minute summer	410	18	111.572	0.142	78.3	0.2499	0.0000	OK
4320 minute summer	DB11	2820	109.931	1.231	8.9	240.9805	0.0000	SURCHARGED
15 minute summer	412	10	116.655	0.035	5.6	0.0482	0.0000	OK
15 minute summer	413	10	115.373	0.073	8.5	0.1132	0.0000	OK
30 minute summer	414	18	115.355	0.173	31.1	0.2460	0.0000	OK
15 minute summer	415	10	115.733	0.185	16.3	0.3869	0.0000	SURCHARGED
15 minute summer	416	10	115.468	0.108	19.5	0.1444	0.0000	OK
15 minute summer	417	11	113.897	0.116	49.8	0.1312	0.0000	OK
15 minute summer	418	10	112.536	0.136	62.7	0.2207	0.0000	OK
15 minute summer	419	10	112.002	0.127	65.1	0.1574	0.0000	OK
15 minute summer	420	10	111.225	0.022	2.3	0.0278	0.0000	OK
4320 minute summer	DB21	2820	109.868	2.258	7.6	170.0005	0.0000	SURCHARGED
15 minute summer	422	10	116.073	0.045	8.6	0.0696	0.0000	OK
15 minute summer	423	11	114.758	0.107	8.2	0.1694	0.0000	OK
15 minute summer	424	11	114.755	0.180	33.4	0.2550	0.0000	OK
15 minute summer	425	11	113.589	0.089	35.7	0.1075	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	401	1	402	5.0	0.938	0.045	0.1102	
30 minute summer	402	2	403	16.0	1.553	0.168	0.2553	
30 minute summer	403	3	405	21.5	1.541	0.247	0.3626	
15 minute summer	404	4	405	4.4	1.215	0.046	0.0667	
15 minute summer	405	5	406	39.3	2.397	0.353	0.2716	
15 minute summer	406	6	410	43.0	2.049	0.386	0.7680	
10080 minute winter	407	18.003	DB34	0.7	0.679	0.007	0.1631	
15 minute summer	408	8	410	2.0	0.940	0.022	0.0405	
30 minute summer	409	9	410	0.7	0.048	0.019	0.1816	
30 minute summer	410	10	DB11	77.7	3.005	0.697	0.9306	
4320 minute summer	DB11	Hydro-Brake®	DB21	4.0				
15 minute summer	412	12	414	5.6	1.462	0.050	0.1062	
15 minute summer	413	13	414	8.5	0.410	0.232	0.5190	
30 minute summer	414	14	417	30.9	1.022	0.845	0.2032	
15 minute summer	415	15	416	15.2	0.889	1.215	0.3614	
15 minute summer	416	16	417	19.2	1.498	0.755	0.1340	
15 minute summer	417	17	418	50.2	2.584	0.450	0.2638	
15 minute summer	418	18	419	62.4	2.596	0.560	0.2777	
15 minute summer	419	19	DB21	64.7	2.876	0.581	0.5431	
15 minute summer	420	20	DB21	2.3	1.122	0.021	0.0570	
4320 minute summer	DB21	Hydro-Brake®	433	3.8				
15 minute summer	422	22	424	8.6	1.560	0.084	0.1442	
15 minute summer	423	23	424	7.4	0.396	0.201	0.3987	
15 minute summer	424	24	425	33.2	1.055	0.907	0.3955	
15 minute summer	425	25	426	35.8	2.114	0.321	0.2834	

Results for 5 year Critical Storm Duration. Lowest mass balance: 99.42%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	426	10	112.851	0.110	45.7	0.2170	0.0000	OK
15 minute summer	427	11	112.366	0.106	47.4	0.1346	0.0000	OK
5760 minute summer	DB28	3600	111.271	2.736	3.9	131.9025	0.0000	SURCHARGED
15 minute summer	429	10	114.858	0.033	5.3	0.0471	0.0000	OK
15 minute summer	430	10	114.402	0.042	7.7	0.0663	0.0000	OK
5760 minute summer	431	3600	112.364	0.363	1.6	0.5016	0.0000	SURCHARGED
4320 minute summer	432	2820	107.336	0.053	5.0	0.0766	0.0000	OK
5760 minute summer	DB33	3600	112.363	1.788	2.8	92.3763	0.0000	SURCHARGED
4320 minute summer	outfall	2820	106.763	0.051	5.4	0.0000	0.0000	OK
4320 minute summer	411	2820	107.046	0.055	5.4	0.0792	0.0000	OK
10080 minute winter	DB34	8880	111.235	2.560	0.7	85.4078	0.0000	SURCHARGED
4320 minute summer	433	2820	107.627	0.050	3.8	0.0570	0.0000	OK
4320 minute summer	434	2820	107.407	0.054	5.0	0.0772	0.0000	OK
4320 minute summer	435	2820	107.242	0.055	5.0	0.0788	0.0000	OK
4320 minute summer	436	2820	107.206	0.053	5.0	0.0752	0.0000	OK
30 minute summer	PPSW1	19	114.550	0.050	7.2	1.3501	0.0000	OK
30 minute summer	PPSW2	19	116.571	0.070	17.3	3.2723	0.0000	OK
30 minute summer	PPSW3	19	117.563	0.063	14.3	2.4150	0.0000	OK
15 minute summer	PPSW4	11	117.061	0.061	13.3	1.8864	0.0000	OK
30 minute summer	PPSW5	20	114.087	0.086	29.4	7.6174	0.0000	OK
60 minute summer	PPSW6	37	115.532	0.032	3.4	1.7435	0.0000	OK
60 minute summer	PPSW7	36	113.526	0.026	1.9	0.8163	0.0000	OK
60 minute summer	PPSW8	36	116.525	0.025	1.6	0.6508	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	426	26	427	45.1	2.405	0.405	0.1983	
15 minute summer	427	27	DB28	47.5	2.655	0.426	0.3298	
5760 minute summer	DB28	Hydro-Brake®	434	1.2				
15 minute summer	429	29	431	5.3	1.485	0.045	0.1025	
15 minute summer	430	30	431	7.7	1.507	0.075	0.1284	
5760 minute summer	431	31	DB33	1.6	0.095	0.015	1.3989	
4320 minute summer	432	32	435	5.0	0.511	0.043	0.2810	
5760 minute summer	DB33	Hydro-Brake®	407	0.8				
4320 minute summer	411	1.013	outfall	5.4	0.562	0.047	0.8034	1084.2
10080 minute winter	DB34	DB33	411	0.4	0.330	0.012	0.0554	
4320 minute summer	433	1.008	434	3.8	0.523	0.059	0.3231	
4320 minute summer	434	1.009	432	5.0	0.519	0.043	0.2022	
4320 minute summer	435	1.011	436	5.0	0.515	0.043	0.0987	
4320 minute summer	436	436	411	5.0	0.513	0.043	0.4724	
30 minute summer	PPSW1	20.000	431	5.6	1.484	0.467	0.0344	
30 minute summer	PPSW2	17.000	424	13.2	2.301	0.777	0.0414	
30 minute summer	PPSW3	11.000	414	11.6	2.276	0.685	0.0621	
15 minute summer	PPSW4	2.000	402	10.5	2.186	0.623	0.0259	
30 minute summer	PPSW5	7.000	410	17.2	2.373	1.016	0.0888	
60 minute summer	PPSW6	4.000	405	1.7	0.809	0.210	0.0172	
60 minute summer	PPSW7	6.000	410	1.2	0.715	0.148	0.0202	
60 minute summer	PPSW8	12.000	414	1.1	0.695	0.134	0.0152	

Results for 10 year Critical Storm Duration. Lowest mass balance: 99.42%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	401	10	116.246	0.035	5.8	0.0476	0.0000	OK
15 minute summer	402	11	115.454	0.067	18.4	0.0803	0.0000	OK
30 minute summer	403	18	114.645	0.082	25.0	0.1149	0.0000	OK
15 minute summer	404	10	115.101	0.036	5.1	0.0495	0.0000	OK
15 minute summer	405	10	113.953	0.108	46.5	0.1777	0.0000	OK
15 minute summer	406	10	113.198	0.105	50.7	0.1331	0.0000	OK
10080 minute summer	407	9360	111.326	1.646	0.8	1.8620	0.0000	SURCHARGED
15 minute summer	408	10	113.100	0.025	2.3	0.0308	0.0000	OK
30 minute summer	409	18	111.589	0.117	0.9	0.1363	0.0000	OK
30 minute summer	410	18	111.588	0.158	90.6	0.2785	0.0000	OK
4320 minute summer	DB11	2820	110.051	1.351	9.7	266.4549	0.0000	SURCHARGED
15 minute summer	412	10	116.657	0.037	6.5	0.0518	0.0000	OK
15 minute summer	413	11	115.380	0.080	9.8	0.1236	0.0000	OK
15 minute summer	414	10	115.374	0.193	36.6	0.2739	0.0000	OK
15 minute summer	415	10	115.789	0.241	18.9	0.5049	0.0000	SURCHARGED
15 minute summer	416	10	115.482	0.122	22.3	0.1621	0.0000	OK
15 minute summer	417	11	113.908	0.127	57.5	0.1436	0.0000	OK
15 minute summer	418	10	112.551	0.151	72.6	0.2456	0.0000	OK
15 minute summer	419	10	112.014	0.139	75.3	0.1733	0.0000	OK
15 minute summer	420	10	111.226	0.024	2.6	0.0295	0.0000	OK
4320 minute summer	DB21	2820	109.987	2.377	8.7	194.6606	0.0000	SURCHARGED
15 minute summer	422	10	116.076	0.048	9.9	0.0748	0.0000	OK
15 minute summer	423	11	114.783	0.132	9.5	0.2103	0.0000	OK
15 minute summer	424	11	114.780	0.205	38.5	0.2897	0.0000	OK
15 minute summer	425	11	113.597	0.097	41.1	0.1167	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	401	1	402	5.8	0.959	0.052	0.1231	
15 minute summer	402	2	403	18.5	1.621	0.195	0.2835	
30 minute summer	403	3	405	24.9	1.595	0.286	0.4058	
15 minute summer	404	4	405	5.1	1.268	0.053	0.0740	
15 minute summer	405	5	406	46.0	2.488	0.413	0.3060	
15 minute summer	406	6	410	50.2	2.113	0.451	0.8663	
10080 minute summer	407	18.003	DB34	0.8	0.679	0.007	0.1631	
15 minute summer	408	8	410	2.3	0.981	0.025	0.0447	
30 minute summer	409	9	410	1.0	0.049	0.028	0.2121	
30 minute summer	410	10	DB11	90.3	3.092	0.810	1.0508	
4320 minute summer	DB11	Hydro-Brake®	DB21	3.8				
15 minute summer	412	12	414	6.5	1.525	0.058	0.1181	
15 minute summer	413	13	414	9.6	0.420	0.263	0.5769	
15 minute summer	414	14	417	35.6	1.073	0.972	0.2223	
15 minute summer	415	15	416	17.3	0.998	1.383	0.3712	
15 minute summer	416	16	417	21.9	1.527	0.860	0.1498	
15 minute summer	417	17	418	57.6	2.662	0.517	0.2941	
15 minute summer	418	18	419	72.2	2.663	0.649	0.3132	
15 minute summer	419	19	DB21	74.5	2.966	0.669	0.6073	
15 minute summer	420	20	DB21	2.6	1.165	0.023	0.0622	
4320 minute summer	DB21	Hydro-Brake®	433	3.9				
15 minute summer	422	22	424	9.9	1.624	0.097	0.1595	
15 minute summer	423	23	424	8.3	0.401	0.225	0.4718	
15 minute summer	424	24	425	38.2	1.098	1.045	0.4346	
15 minute summer	425	25	426	41.3	2.174	0.370	0.3176	

Results for 10 year Critical Storm Duration. Lowest mass balance: 99.42%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	426	10	112.862	0.122	52.8	0.2387	0.0000	OK
15 minute summer	427	11	112.375	0.115	55.0	0.1468	0.0000	OK
4320 minute summer	DB28	2820	111.448	2.913	5.1	153.2070	0.0000	SURCHARGED
15 minute summer	429	10	114.861	0.036	6.2	0.0509	0.0000	OK
15 minute summer	430	10	114.406	0.046	8.9	0.0713	0.0000	OK
2880 minute summer	431	1980	112.483	0.483	2.7	0.6660	0.0000	SURCHARGED
4320 minute summer	432	2820	107.337	0.054	5.1	0.0776	0.0000	OK
2880 minute summer	DB33	1980	112.483	1.908	4.5	107.0990	0.0000	SURCHARGED
4320 minute summer	outfall	2880	106.763	0.052	5.5	0.0000	0.0000	OK
4320 minute summer	411	2880	107.047	0.056	5.5	0.0801	0.0000	OK
10080 minute summer	DB34	9360	111.326	2.651	0.8	91.9733	0.0000	SURCHARGED
4320 minute summer	433	2820	107.628	0.051	3.9	0.0577	0.0000	OK
4320 minute summer	434	2820	107.408	0.055	5.1	0.0782	0.0000	OK
4320 minute summer	435	2820	107.243	0.056	5.1	0.0798	0.0000	OK
4320 minute summer	436	2820	107.206	0.053	5.1	0.0761	0.0000	OK
30 minute summer	PPSW1	19	114.555	0.055	8.3	1.4877	0.0000	OK
30 minute summer	PPSW2	19	116.580	0.080	20.1	3.6942	0.0000	OK
30 minute summer	PPSW3	19	117.570	0.070	16.6	2.6922	0.0000	OK
15 minute summer	PPSW4	11	117.068	0.068	15.4	2.1044	0.0000	OK
30 minute summer	PPSW5	21	114.102	0.102	34.1	8.9776	0.0000	SURCHARGED
60 minute summer	PPSW6	37	115.535	0.035	3.9	1.9474	0.0000	OK
60 minute summer	PPSW7	36	113.529	0.029	2.2	0.9043	0.0000	OK
60 minute summer	PPSW8	36	116.528	0.028	1.9	0.7203	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	426	26	427	52.3	2.478	0.469	0.2233	
15 minute summer	427	27	DB28	54.8	2.749	0.492	0.3680	
4320 minute summer	DB28	Hydro-Brake®	434	1.2				
15 minute summer	429	29	431	6.2	1.555	0.053	0.1145	
15 minute summer	430	30	431	8.9	1.572	0.087	0.1423	
2880 minute summer	431	31	DB33	2.6	0.094	0.024	1.3989	
4320 minute summer	432	32	435	5.1	0.514	0.044	0.2861	
2880 minute summer	DB33	Hydro-Brake®	407	0.8				
4320 minute summer	411	1.013	outfall	5.5	0.566	0.048	0.8169	1126.5
10080 minute summer	DB34	DB33	411	0.5	0.331	0.012	0.0561	
4320 minute summer	433	1.008	434	3.9	0.527	0.061	0.3286	
4320 minute summer	434	1.009	432	5.1	0.522	0.044	0.2058	
4320 minute summer	435	1.011	436	5.1	0.519	0.044	0.1005	
4320 minute summer	436	436	411	5.1	0.517	0.044	0.4806	
30 minute summer	PPSW1	20.000	431	6.6	1.541	0.547	0.0388	
30 minute summer	PPSW2	17.000	424	15.1	2.340	0.892	0.0467	
30 minute summer	PPSW3	11.000	414	13.4	2.340	0.795	0.0701	
15 minute summer	PPSW4	2.000	402	12.3	2.251	0.726	0.0293	
30 minute summer	PPSW5	7.000	410	17.5	2.369	1.033	0.0926	
60 minute summer	PPSW6	4.000	405	2.1	0.856	0.258	0.0200	
60 minute summer	PPSW7	6.000	410	1.4	0.756	0.181	0.0233	
60 minute summer	PPSW8	12.000	414	1.3	0.735	0.164	0.0176	

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.42%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	401	10	116.250	0.039	7.4	0.0536	0.0000	OK
30 minute summer	402	18	115.462	0.075	23.3	0.0904	0.0000	OK
15 minute summer	403	10	114.657	0.094	32.3	0.1312	0.0000	OK
15 minute summer	404	10	115.105	0.040	6.4	0.0555	0.0000	OK
15 minute summer	405	10	113.971	0.126	59.3	0.2077	0.0000	OK
15 minute summer	406	10	113.215	0.122	64.8	0.1540	0.0000	OK
10080 minute summer	407	10020	111.492	1.812	0.8	2.0494	0.0000	SURCHARGED
15 minute summer	408	10	113.103	0.028	2.9	0.0344	0.0000	OK
15 minute summer	409	10	111.623	0.151	1.6	0.1760	0.0000	OK
15 minute summer	410	10	111.620	0.190	115.0	0.3361	0.0000	OK
4320 minute summer	DB11	2880	110.336	1.636	11.3	327.1407	0.0000	SURCHARGED
15 minute summer	412	10	116.661	0.041	8.2	0.0573	0.0000	OK
15 minute summer	413	11	115.428	0.128	12.4	0.1980	0.0000	OK
15 minute summer	414	11	115.420	0.239	45.4	0.3389	0.0000	SURCHARGED
15 minute summer	415	11	115.945	0.396	24.0	0.8303	0.0000	SURCHARGED
15 minute summer	416	11	115.584	0.224	27.6	0.2985	0.0000	SURCHARGED
15 minute summer	417	11	113.929	0.148	71.2	0.1670	0.0000	OK
15 minute summer	418	11	112.578	0.178	87.7	0.2884	0.0000	OK
15 minute summer	419	11	112.037	0.162	91.3	0.2018	0.0000	OK
15 minute summer	420	10	111.229	0.027	3.3	0.0330	0.0000	OK
4320 minute summer	DB21	2880	110.271	2.661	11.0	253.7834	0.0000	SURCHARGED
15 minute summer	422	10	116.082	0.054	12.5	0.0843	0.0000	OK
30 minute summer	423	18	114.854	0.203	11.4	0.3228	0.0000	OK
30 minute summer	424	18	114.847	0.272	48.1	0.3845	0.0000	SURCHARGED
30 minute summer	425	18	113.611	0.111	52.0	0.1342	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	401	1	402	7.4	1.006	0.066	0.1468	
30 minute summer	402	2	403	23.3	1.716	0.244	0.3358	
15 minute summer	403	3	405	31.8	1.687	0.365	0.4969	
15 minute summer	404	4	405	6.4	1.353	0.067	0.0871	
15 minute summer	405	5	406	58.8	2.627	0.528	0.3704	
15 minute summer	406	6	410	64.3	2.194	0.577	1.0574	
10080 minute summer	407	18.003	DB34	0.8	0.679	0.007	0.1631	
15 minute summer	408	8	410	2.9	1.051	0.031	0.0527	
15 minute summer	409	9	410	1.9	0.067	0.052	0.2690	
15 minute summer	410	10	DB11	113.2	3.127	1.017	1.3610	
4320 minute summer	DB11	Hydro-Brake®	DB21	3.8				
15 minute summer	412	12	414	8.2	1.605	0.074	0.1822	
15 minute summer	413	13	414	11.0	0.434	0.299	0.7469	
15 minute summer	414	14	417	44.8	1.167	1.223	0.2465	
15 minute summer	415	15	416	21.4	1.215	1.710	0.3975	
15 minute summer	416	16	417	26.5	1.519	1.039	0.1810	
15 minute summer	417	17	418	71.3	2.773	0.640	0.3490	
15 minute summer	418	18	419	88.0	2.735	0.790	0.3714	
15 minute summer	419	19	DB21	92.2	3.083	0.828	0.7215	
15 minute summer	420	20	DB21	3.3	1.252	0.030	0.0735	
4320 minute summer	DB21	Hydro-Brake®	433	4.1				
15 minute summer	422	22	424	12.5	1.734	0.122	0.1886	
30 minute summer	423	23	424	10.8	0.341	0.296	0.5879	
30 minute summer	424	24	425	48.1	1.228	1.313	0.4685	
30 minute summer	425	25	426	51.9	2.250	0.466	0.3855	

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.42%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	426	10	112.883	0.143	66.9	0.2805	0.0000	OK
15 minute summer	427	11	112.394	0.134	69.4	0.1707	0.0000	OK
2880 minute summer	DB28	2040	111.747	3.212	7.2	189.1681	0.0000	SURCHARGED
15 minute summer	429	10	114.865	0.040	7.8	0.0571	0.0000	OK
15 minute summer	430	10	114.412	0.051	11.3	0.0805	0.0000	OK
5760 minute summer	431	3780	112.687	0.687	2.0	0.9482	0.0000	SURCHARGED
4320 minute summer	432	2880	107.338	0.055	5.4	0.0795	0.0000	OK
5760 minute summer	DB33	3780	112.687	2.112	3.5	132.3823	0.0000	SURCHARGED
4320 minute summer	outfall	2940	106.764	0.053	5.8	0.0000	0.0000	OK
4320 minute summer	411	2940	107.048	0.057	5.8	0.0820	0.0000	OK
10080 minute summer	DB34	10020	111.492	2.817	0.8	103.9010	0.0000	SURCHARGED
4320 minute summer	433	2880	107.629	0.052	4.1	0.0592	0.0000	OK
4320 minute summer	434	2880	107.409	0.056	5.4	0.0801	0.0000	OK
4320 minute summer	435	2880	107.244	0.057	5.4	0.0819	0.0000	OK
4320 minute summer	436	2880	107.208	0.055	5.4	0.0781	0.0000	OK
30 minute summer	PPSW1	19	114.565	0.065	10.6	1.7685	0.0000	OK
30 minute summer	PPSW2	20	116.603	0.103	25.6	4.7906	0.0000	SURCHARGED
30 minute summer	PPSW3	19	117.585	0.085	21.2	3.2712	0.0000	OK
15 minute summer	PPSW4	11	117.083	0.083	19.6	2.5676	0.0000	OK
30 minute summer	PPSW5	21	114.142	0.142	43.5	12.4954	0.0000	SURCHARGED
60 minute summer	PPSW6	37	115.542	0.042	4.9	2.3095	0.0000	OK
30 minute summer	PPSW7	20	113.534	0.034	3.6	1.0648	0.0000	OK
30 minute summer	PPSW8	20	116.533	0.033	3.0	0.8562	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	426	26	427	65.9	2.588	0.592	0.2697	
15 minute summer	427	27	DB28	69.6	2.904	0.625	0.4422	
2880 minute summer	DB28	Hydro-Brake®	434	1.3				
15 minute summer	429	29	431	7.8	1.662	0.067	0.1349	
15 minute summer	430	30	431	11.3	1.682	0.110	0.1689	
5760 minute summer	431	31	DB33	2.0	0.089	0.019	1.3989	
4320 minute summer	432	32	435	5.4	0.522	0.047	0.2967	
5760 minute summer	DB33	Hydro-Brake®	407	0.9				
4320 minute summer	411	1.013	outfall	5.8	0.574	0.050	0.8445	1199.7
10080 minute summer	DB34	DB33	411	0.5	0.333	0.013	0.0572	
4320 minute summer	433	1.008	434	4.1	0.534	0.064	0.3415	
4320 minute summer	434	1.009	432	5.4	0.530	0.047	0.2134	
4320 minute summer	435	1.011	436	5.4	0.526	0.047	0.1042	
4320 minute summer	436	436	411	5.4	0.526	0.047	0.4976	
30 minute summer	PPSW1	20.000	431	8.6	1.630	0.710	0.0476	
30 minute summer	PPSW2	17.000	424	17.1	2.340	1.008	0.0567	
30 minute summer	PPSW3	11.000	414	17.1	2.364	1.010	0.0910	
15 minute summer	PPSW4	2.000	402	15.3	2.312	0.906	0.0355	
30 minute summer	PPSW5	7.000	410	17.4	2.384	1.031	0.0922	
60 minute summer	PPSW6	4.000	405	2.9	0.929	0.352	0.0251	
30 minute summer	PPSW7	6.000	410	1.9	0.824	0.247	0.0291	
30 minute summer	PPSW8	12.000	414	1.8	0.805	0.228	0.0223	

Results for 100 year +20% CC Critical Storm Duration. Lowest mass balance: 99.42%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	401	10	116.260	0.049	11.5	0.0665	0.0000	OK
15 minute summer	402	9	115.473	0.086	30.8	0.1035	0.0000	OK
15 minute summer	403	10	114.676	0.113	44.2	0.1582	0.0000	OK
15 minute summer	404	10	115.116	0.051	10.0	0.0695	0.0000	OK
15 minute summer	405	11	114.102	0.257	87.9	0.4246	0.0000	SURCHARGED
30 minute summer	406	19	113.661	0.568	93.7	0.7178	0.0000	SURCHARGED
10080 minute winter	407	10020	112.101	2.420	0.8	2.7375	0.0000	SURCHARGED
15 minute summer	408	10	113.109	0.034	4.5	0.0426	0.0000	OK
30 minute summer	409	19	112.647	1.175	9.2	1.3728	0.0000	FLOOD RISK
30 minute summer	410	19	112.644	1.214	153.7	2.1433	0.0000	SURCHARGED
2160 minute summer	DB11	1320	111.599	2.899	23.9	426.6065	0.0000	FLOOD RISK
15 minute summer	412	10	116.671	0.051	12.8	0.0713	0.0000	OK
15 minute summer	413	10	115.566	0.266	19.3	0.4130	0.0000	SURCHARGED
15 minute summer	414	10	115.528	0.347	65.4	0.4923	0.0000	SURCHARGED
15 minute summer	415	11	116.651	1.103	37.3	2.3091	0.0000	FLOOD RISK
15 minute summer	416	11	115.891	0.531	38.1	0.7074	0.0000	SURCHARGED
15 minute summer	417	11	114.007	0.226	100.1	0.2554	0.0000	SURCHARGED
15 minute summer	418	11	113.416	1.016	129.3	1.6483	0.0000	SURCHARGED
30 minute summer	419	19	112.520	0.645	125.3	0.8022	0.0000	SURCHARGED
2880 minute winter	420	2280	111.503	0.301	0.2	0.3722	0.0000	SURCHARGED
2880 minute winter	DB21	2280	111.503	3.893	16.7	510.4331	0.0000	SURCHARGED
15 minute summer	422	10	116.096	0.068	19.5	0.1063	0.0000	OK
15 minute summer	423	10	115.046	0.395	18.7	0.6274	0.0000	SURCHARGED
15 minute summer	424	10	115.021	0.446	68.7	0.6312	0.0000	SURCHARGED
15 minute summer	425	10	113.641	0.141	75.2	0.1706	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	401	1	402	11.5	1.155	0.103	0.1833	
15 minute summer	402	2	403	29.8	1.781	0.313	0.4182	
15 minute summer	403	3	405	44.2	1.735	0.508	0.7573	
15 minute summer	404	4	405	10.0	1.537	0.105	0.1198	
15 minute summer	405	5	406	83.1	2.755	0.746	0.6579	
30 minute summer	406	6	410	88.0	2.241	0.790	1.4552	
10080 minute winter	407	18.003	DB34	0.9	0.679	0.008	0.1631	
15 minute summer	408	8	410	4.5	1.198	0.049	0.3022	
30 minute summer	409	9	410	9.8	0.247	0.269	0.3338	
30 minute summer	410	10	DB11	137.0	3.446	1.230	1.4318	
2160 minute summer	DB11	Hydro-Brake®	DB21	11.5				
15 minute summer	412	12	414	12.8	1.633	0.115	0.5386	
15 minute summer	413	13	414	18.7	0.471	0.512	0.9429	
15 minute summer	414	14	417	64.0	1.612	1.750	0.2612	
15 minute summer	415	15	416	29.8	1.695	2.389	0.3977	
15 minute summer	416	16	417	37.7	2.142	1.480	0.1816	
15 minute summer	417	17	418	98.4	2.866	0.883	0.5403	
15 minute summer	418	18	419	121.7	3.060	1.092	0.4594	
30 minute summer	419	19	DB21	125.4	3.153	1.126	0.9594	
2880 minute winter	420	20	DB21	0.2	0.543	0.002	1.1117	
2880 minute winter	DB21	Hydro-Brake®	433	4.9				
15 minute summer	422	22	424	19.5	1.961	0.190	0.2602	
15 minute summer	423	23	424	18.1	0.456	0.496	0.6032	
15 minute summer	424	24	425	68.3	1.719	1.867	0.4928	
15 minute summer	425	25	426	75.1	2.323	0.675	0.5459	

Results for 100 year +20% CC Critical Storm Duration. Lowest mass balance: 99.42%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	426	10	112.954	0.214	100.0	0.4198	0.0000	OK
2880 minute summer	427	2220	112.674	0.414	8.4	0.5276	0.0000	SURCHARGED
2880 minute summer	DB28	2220	112.674	4.139	10.3	300.5200	0.0000	SURCHARGED
15 minute summer	429	10	114.875	0.050	12.2	0.0714	0.0000	OK
15 minute summer	430	10	114.425	0.065	17.7	0.1016	0.0000	OK
5760 minute summer	431	3960	113.395	1.395	2.7	1.9254	0.0000	SURCHARGED
4320 minute summer	432	3000	107.343	0.060	6.3	0.0862	0.0000	OK
5760 minute summer	DB33	3960	113.395	2.820	4.8	219.9026	0.0000	FLOOD RISK
4320 minute summer	outfall	3000	106.769	0.058	6.8	0.0000	0.0000	OK
4320 minute summer	411	3000	107.053	0.062	6.8	0.0884	0.0000	OK
10080 minute winter	DB34	9900	112.100	3.424	0.9	140.5111	0.0000	FLOOD RISK
2880 minute winter	433	2280	107.634	0.057	4.9	0.0644	0.0000	OK
4320 minute summer	434	3000	107.414	0.061	6.3	0.0870	0.0000	OK
4320 minute summer	435	3000	107.249	0.062	6.3	0.0890	0.0000	OK
4320 minute summer	436	3000	107.212	0.059	6.3	0.0848	0.0000	OK
30 minute summer	PPSW1	19	114.595	0.095	16.6	2.5975	0.0000	OK
30 minute summer	PPSW2	21	116.703	0.203	40.1	9.4011	0.0000	FLOOD RISK
30 minute summer	PPSW3	20	117.671	0.171	33.2	6.5693	0.0000	SURCHARGED
30 minute summer	PPSW4	20	117.163	0.163	29.1	5.0483	0.0000	SURCHARGED
60 minute summer	PPSW5	40	114.262	0.262	52.4	23.0435	0.0000	FLOOD RISK
60 minute summer	PPSW6	36	115.558	0.058	7.7	3.1803	0.0000	OK
30 minute summer	PPSW7	20	113.548	0.047	5.6	1.4723	0.0000	OK
30 minute summer	PPSW8	19	116.545	0.045	4.7	1.1615	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	426	26	427	98.9	2.694	0.888	0.3901	
2880 minute summer	427	27	DB28	8.4	1.645	0.075	0.7335	
2880 minute summer	DB28	Hydro-Brake®	434	1.4				
15 minute summer	429	29	431	12.2	1.891	0.105	0.1854	
15 minute summer	430	30	431	17.7	1.906	0.173	0.2335	
5760 minute summer	431	31	DB33	2.7	0.067	0.025	1.3989	
4320 minute summer	432	32	435	6.3	0.545	0.055	0.3344	
5760 minute summer	DB33	Hydro-Brake®	407	0.9				
4320 minute summer	411	1.013	outfall	6.8	0.601	0.059	0.9427	1400.0
10080 minute winter	DB34	DB33	411	0.5	0.340	0.014	0.0612	
2880 minute winter	433	1.008	434	4.9	0.559	0.077	0.3899	
4320 minute summer	434	1.009	432	6.3	0.555	0.055	0.2402	
4320 minute summer	435	1.011	436	6.3	0.549	0.055	0.1175	
4320 minute summer	436	436	411	6.3	0.552	0.055	0.5579	
30 minute summer	PPSW1	20.000	431	12.3	1.688	1.019	0.0702	
30 minute summer	PPSW2	17.000	424	17.0	2.335	1.007	0.0567	
30 minute summer	PPSW3	11.000	414	17.5	2.351	1.034	0.0954	
30 minute summer	PPSW4	2.000	402	16.7	2.289	0.986	0.0420	
60 minute summer	PPSW5	7.000	410	17.5	2.369	1.032	0.0926	
60 minute summer	PPSW6	4.000	405	4.9	1.059	0.600	0.0375	
30 minute summer	PPSW7	6.000	410	3.5	0.962	0.443	0.0448	
30 minute summer	PPSW8	12.000	414	3.1	0.934	0.396	0.0335	

Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	5	Maximum Rainfall (mm/hr)	50.0
Additional Flow (%)	0	Minimum Velocity (m/s)	1.00
FSR Region	Scotland and Ireland	Connection Type	Level Soffits
M5-60 (mm)	18.400	Minimum Backdrop Height (m)	0.200
Ratio-R	0.216	Preferred Cover Depth (m)	1.200
CV	1.000	Include Intermediate Ground	✓
Time of Entry (mins)	4.00	Enforce best practice design rules	x

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
1	0.013	4.00	120.200	1200	712444.396	725834.285	1.751
2	0.012	4.00	119.460	1200	712443.102	725843.296	2.316
3	0.015	4.00	117.450	1200	712424.585	725858.207	1.990
4	0.014	4.00	115.700	1200	712406.201	725872.964	1.425
5	0.018	4.00	116.200	1200	712409.686	725856.004	2.012
6	0.041	4.00	116.170	1200	712396.975	725840.881	1.624
7	0.024	4.00	115.400	1200	712394.562	725853.212	1.911
8	0.041	4.00	114.300	1200	712370.372	725835.221	1.425
9	0.022	4.00	114.100	1200	712367.930	725848.633	1.839
10	0.033	4.00	113.010	1200	712344.132	725830.416	1.425
11	0.035	4.00	112.700	1200	712342.170	725842.573	1.642
12	0.006	4.00	111.950	1200	712327.679	725838.208	3.118
13	0.047	4.00	111.550	1200	712317.918	725825.750	1.425
14	0.019	4.00	111.300	1200	712315.440	725837.407	2.591
15	0.064	4.00	110.340	1200	712291.496	725820.181	1.425
16	0.038	4.00	110.000	1200	712288.840	725833.764	2.158
PP NE1	0.016	4.00	116.200		712400.145	725867.690	0.500
18	0.106	4.00	109.000	1200	712253.084	725827.107	1.925
19	0.041	4.00	108.980	1200	712219.722	725806.687	1.425
20	0.041	4.00	108.910	1200	712217.166	725820.290	1.957
21	0.041	4.00	109.280	1200	712193.184	725803.870	1.225
22	0.009	4.00	109.130	1200	712190.998	725813.851	2.267
23	0.041	4.00	109.000	1200	712170.353	725796.710	1.125
24	0.022	4.00	108.900	1200	712168.798	725810.611	2.131
25	0.040	4.00	108.680	1200	712144.996	725787.549	1.425
26	0.040	4.00	108.620	1200	712141.353	725806.330	1.920
27	0.049	4.00	108.480	1200	712114.553	725787.773	1.425
28	0.017	4.00	108.550	1200	712111.672	725800.935	1.946
29	0.065	4.00	109.340	1200	712091.650	725781.104	1.425
30	0.050	4.00	109.240	1200	712088.776	725796.729	2.714
31	0.013	4.00	109.800	1200	712068.268	725792.752	3.326
17			118.000	1200	712434.978	725853.931	1.464
33		4.00	117.303	1200	712136.577	725753.998	2.190
34	0.049	4.00	114.990	1200	712102.590	725751.733	2.193
35			113.030	1200	712072.756	725749.670	1.592
36	0.003	4.00	112.350	1200	712064.009	725756.793	2.477
37	0.008	4.00	111.825	1200	712040.411	725763.712	1.425
38	0.018	4.00	111.465	1200	712061.527	725767.920	1.960
39	0.022	4.00	110.460	1200	712060.429	725784.765	4.023
out fall			109.000		712019.767	725802.125	2.800
41	0.003	4.00	112.450	1200	712336.173	725840.091	2.387

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
Tree pits 3	0.039	4.00	112.070		712331.139	725849.033	3.200
43	0.008	4.00	109.103	1200	712183.789	725812.592	2.264
Tree pits 2	0.034	4.00	108.800		712180.755	725819.549	1.986
45	0.009	4.00	109.155	1200	712178.906	725811.738	2.361
46	0.010	4.00	108.430	1200	712115.396	725801.587	1.796
Tree pits 1	0.017	4.00	108.300		712111.753	725806.660	1.682
Tree Pits 4	0.084	4.00	110.526		712054.268	725785.567	4.126
PP NE2	0.055	4.00	112.700		712353.011	725849.343	0.500
PP NE3	0.056	4.00	109.000		712272.430	725837.569	0.500
PP NE4	0.056	4.00	109.080		712194.517	725819.078	0.500
PP NE5	0.059	4.00	108.380		712124.496	725807.254	0.500
PP NE6	0.056	4.00	109.800		712064.528	725799.652	0.500
PP NE7	0.034	4.00	111.465		712050.148	725770.283	0.500
dba			109.500		712039.120	725793.077	3.100
DB B			107.500		712029.620	725797.191	1.200

Links

Name	US Node	DS Node	Length (m)	US IL (m)	DS IL (m)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1	1	2	9.103	118.449	118.035	225	4.05	50.0
2	2	17	13.383	117.144	116.536	225	4.13	50.0
3	3	5	15.061	115.460	114.775	225	4.29	50.0
4	4	5	17.314	114.275	114.188	225	4.31	50.0
5	5	7	15.380	114.188	113.489	225	4.40	50.0
6	6	7	12.565	114.546	114.043	225	4.08	50.0
7	7	9	27.023	113.489	112.261	225	4.57	50.0
8	8	9	13.633	112.875	112.739	225	4.17	50.0
9	9	11	26.463	112.261	111.058	225	4.72	50.0
10	10	11	12.314	111.585	111.058	225	4.08	50.0
11	11	41	6.490	111.058	110.763	225	4.76	50.0
41	41	Tree pits 3	10.262	110.063	109.597	225	4.82	50.0
42	Tree pits 3	12	11.365	108.870	108.832	300	5.03	50.0
12	12	14	12.265	108.832	108.709	300	5.16	50.0

Name	Vel (m/s)	Cap (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)
1	2.801	111.4	1.526	1.200	0.013
2	2.801	111.4	2.091	1.239	0.025
3	2.802	111.4	1.765	1.200	0.040
4	0.921	36.6	1.200	1.787	0.014
5	2.801	111.4	1.787	1.686	0.088
6	2.628	104.5	1.399	1.132	0.041
7	2.801	111.4	1.686	1.614	0.153
8	1.307	52.0	1.200	1.136	0.041
9	2.801	111.4	1.614	1.417	0.216
10	2.718	108.1	1.200	1.417	0.033
11	2.801	111.4	1.417	1.462	0.339
41	2.801	111.4	2.162	2.248	0.342
42	0.902	63.8	2.900	2.818	0.380
12	1.572	111.1	2.818	2.291	0.386

Links

Name	US Node	DS Node	Length (m)	US IL (m)	DS IL (m)	Dia (mm)	T of C (mins)	Rain (mm/hr)
13	13	14	11.917	110.125	109.675	225	4.08	50.0
14	14	16	26.848	108.709	107.842	300	5.32	50.0
15	15	16	13.840	108.915	108.575	225	4.11	50.0
16	16	18	36.370	107.842	107.150	300	5.60	50.0
PP NE1	PP NE1	5	15.086	115.700	115.446	100	4.25	50.0
18	18	20	36.559	107.075	106.953	375	6.19	50.0
19	19	20	13.841	107.555	107.486	225	4.25	50.0
20	20	22	26.949	106.953	106.863	375	6.62	50.0
21	21	22	10.218	108.055	107.851	225	4.09	50.0
22	22	43	7.318	106.863	106.839	375	6.73	50.0
43	43	Tree pits 2	7.590	106.839	106.814	375	6.86	50.0
44	Tree pits 2	45	8.027	106.814	106.794	450	6.99	50.0
45	45	24	10.171	106.794	106.769	450	7.16	50.0
23	23	24	13.988	107.875	107.805	225	4.25	50.0
24	24	26	27.777	106.769	106.700	450	7.61	50.0
25	25	26	19.131	107.255	106.925	225	4.19	50.0
26	26	46	26.387	106.700	106.634	450	8.05	50.0
46	46	Tree pits 1	6.246	106.634	106.618	450	8.15	50.0
47	Tree pits 1	28	5.726	106.618	106.604	450	8.25	50.0
27	27	28	13.474	107.055	106.849	225	4.14	50.0
28	28	30	23.279	106.604	106.526	450	8.58	49.9
29	29	30	15.887	107.915	107.815	225	4.26	50.0
30	30	31	20.890	106.526	106.474	450	8.92	49.1
31	31	39	11.191	106.474	106.437	450	9.08	48.8

Name	Vel (m/s)	Cap (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)
13	2.552	101.5	1.200	1.400	0.047
14	2.835	200.4	2.291	1.858	0.452
15	2.056	81.7	1.200	1.200	0.064
16	2.173	153.6	1.858	1.550	0.554
PP NE1	1.001	7.9	0.400	0.654	0.016
18	1.041	114.9	1.550	1.582	0.716
19	0.921	36.6	1.200	1.199	0.041
20	1.041	114.9	1.582	1.892	0.799
21	1.852	73.6	1.000	1.054	0.041
22	1.041	114.9	1.892	1.889	0.904
43	1.041	114.9	1.889	1.611	0.912
44	1.010	160.7	1.536	1.911	0.946
45	1.010	160.7	1.911	1.681	0.956
23	0.921	36.6	0.900	0.870	0.041
24	1.010	160.7	1.681	1.470	1.019
25	1.721	68.4	1.200	1.470	0.040
26	1.010	160.7	1.470	1.346	1.098
46	1.010	160.7	1.346	1.232	1.168
47	1.010	160.7	1.232	1.496	1.185
27	1.619	64.4	1.200	1.476	0.049
28	1.168	185.8	1.496	2.264	1.251
29	1.034	41.1	1.200	1.200	0.065
30	1.010	160.7	2.264	2.876	1.367
31	1.168	185.8	2.876	3.573	1.436

Links

Name	US Node	DS Node	Length (m)	US IL (m)	DS IL (m)	Dia (mm)	T of C (mins)	Rain (mm/hr)
17	17	3	11.238	116.536	116.025	225	4.20	50.0
33	33	34	34.062	115.113	113.565	225	4.20	50.0
34	34	35	29.905	112.797	111.438	225	4.38	50.0
35	35	36	11.280	111.438	110.925	225	4.45	50.0
36	36	38	11.400	109.873	109.505	300	4.51	50.0
37	37	38	21.531	110.400	110.039	225	4.21	50.0
38	38	39	16.881	109.505	108.960	300	4.61	50.0
39	39	Tree Pits 4	6.213	106.437	106.400	450	9.15	48.6
Basin 0	Tree Pits 4	dba	2.000	106.400	106.400	300	9.18	48.6
PP NE2	PP NE2	11	12.781	112.200	111.950	100	4.20	50.0
PP NE3	PP NE3	18	21.994	108.500	108.232	100	4.43	50.0
13.000	PP NE4	22	6.301	108.580	108.474	100	4.10	50.0
PP NE5	PP NE5	46	10.720	107.880	107.686	100	4.17	50.0
PP NE6	PP NE6	31	7.848	109.300	109.167	100	4.13	50.0
PP NE7	PP NE7	38	11.622	110.965	110.631	100	4.15	50.0
1.028	dba	DB B	10.353	106.400	106.300	300	9.29	48.3
1.029	DB B	out fall	11.019	106.300	106.200	300	9.42	48.1

Name	Vel (m/s)	Cap (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)
17	2.801	111.4	1.239	1.200	0.025
33	2.801	111.4	1.965	1.200	0.000
34	2.801	111.4	1.968	1.367	0.049
35	2.801	111.4	1.367	1.200	0.049
36	2.834	200.3	2.177	1.660	0.052
37	1.696	67.4	1.200	1.201	0.008
38	2.834	200.3	1.660	1.200	0.111
39	1.566	249.0	3.573	3.676	1.569
Basin 0	1.000	70.7	3.826	2.800	1.654
PP NE2	1.080	8.5	0.400	0.650	0.055
PP NE3	0.850	6.7	0.400	0.668	0.056
13.000	1.001	7.9	0.400	0.556	0.056
PP NE5	1.038	8.2	0.400	0.644	0.059
PP NE6	1.004	7.9	0.400	0.533	0.056
PP NE7	1.312	10.3	0.400	0.734	0.034
1.028	1.545	109.2	2.800	0.900	1.654
1.029	1.497	105.8	0.900	2.500	1.654

Simulation Settings

Rainfall Methodology	FSR	Analysis Speed	Normal
Rainfall Events	Singular	Skip Steady State	x
FSR Region	Scotland and Ireland	Drain Down Time (mins)	240
M5-60 (mm)	18.400	Additional Storage (m³/ha)	20.0
Ratio-R	0.216	Starting Level (m)	
Summer CV	1.000	Check Discharge Rate(s)	x
Winter CV	1.000	Check Discharge Volume	x

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 %)
1	0	0	0
5	0	0	0
10	0	0	0
30	0	0	0
100	20	0	0

Node Tree pits 3 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	108.870	Product Number	CTL-SHE-0082-4400-2400-4400
Design Depth (m)	2.400	Min Outlet Diameter (m)	0.100
Design Flow (l/s)	4.4	Min Node Diameter (mm)	1200

Node Tree pits 2 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	106.814	Product Number	CTL-SHE-0388-9770-1200-9770
Design Depth (m)	1.200	Min Outlet Diameter (m)	0.450
Design Flow (l/s)	97.7	Min Node Diameter (mm)	3000

Node Tree pits 1 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	106.618	Product Number	CTL-SHE-0438-1250-0800-1250
Design Depth (m)	0.800	Min Outlet Diameter (m)	0.450
Design Flow (l/s)	125.0	Min Node Diameter (mm)	3000

Node dba Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	106.400	Product Number	CTL-SHE-0197-2610-2800-2610
Design Depth (m)	2.800	Min Outlet Diameter (m)	0.225
Design Flow (l/s)	26.1	Min Node Diameter (mm)	2100

Node DB B Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	106.300	Product Number	CTL-SHE-0219-2540-1118-2540
Design Depth (m)	1.118	Min Outlet Diameter (m)	0.300
Design Flow (l/s)	25.4	Min Node Diameter (mm)	1800

Node dba Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	106.400
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	255

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	36.0	0.0	2.800	36.0	0.0	2.801	0.0	0.0

Node Tree Pits 4 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	106.400
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.96	Time to half empty (mins)	255

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	350.0	0.0	2.800	350.0	0.0	2.801	0.0	0.0

Node Tree pits 1 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	106.618
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.96	Time to half empty (mins)	

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	42.0	0.0	0.800	42.0	0.0	0.801	0.0	0.0

Node Tree pits 2 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	106.814
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.96	Time to half empty (mins)	79

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	48.0	0.0	1.200	48.0	0.0	1.201	0.0	0.0

Node Tree pits 3 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	108.870
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.96	Time to half empty (mins)	

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	120.0	0.0	2.400	120.0	0.0	2.401	0.0	0.0

Node PP NE1 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	115.700
Side Inf Coefficient (m/hr)	0.00000	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	160.0	0.0	0.350	160.0	0.0	0.351	0.0	0.0

Node PP NE2 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	112.200
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.30	Time to half empty (mins)	14

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	133.0	0.0	0.350	133.0	0.0	0.351	0.0	0.0

Node PP NE3 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	108.500
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.30	Time to half empty (mins)	30

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	144.0	0.0	0.350	144.0	0.0	0.351	0.0	0.0

Node PP NE4 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	108.580
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.30	Time to half empty (mins)	20

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	144.0	0.0	0.350	144.0	0.0	0.351	0.0	0.0

Node PP NE5 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	107.880
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.30	Time to half empty (mins)	240

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	144.0	0.0	0.350	144.0	0.0	0.351	0.0	0.0

Node PP NE6 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	109.300
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.30	Time to half empty (mins)	15

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	130.0	0.0	0.350	130.0	0.0	0.351	0.0	0.0

Node PP NE7 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	110.965
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.30	Time to half empty (mins)	3

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	130.0	0.0	0.350	130.0	0.0	0.351	0.0	0.0

Node DB B Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	106.300
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	420

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	37.0	0.0	1.118	37.0	0.0	1.119	0.0	0.0

Other (defaults)

Entry Loss (manhole)	0.250	Entry Loss (junction)	0.000	Apply Recommended Losses	x
Exit Loss (manhole)	0.250	Exit Loss (junction)	0.000	Flood Risk (m)	0.300

Approval Settings

Node Size	✓	Minimum Full Bore Velocity (m/s)	
Node Losses	✓	Maximum Full Bore Velocity (m/s)	3.000
Link Size	✓	Proportional Velocity	✓
Minimum Diameter (mm)	150	Return Period (years)	
Link Length	✓	Minimum Proportional Velocity (m/s)	0.750
Maximum Length (m)	100.000	Maximum Proportional Velocity (m/s)	3.000
Coordinates	✓	Surcharged Depth	✓
Accuracy (m)	1.000	Return Period (years)	
Crossings	✓	Maximum Surcharged Depth (m)	0.100
Cover Depth	✓	Flooding	✓
Minimum Cover Depth (m)		Return Period (years)	30
Maximum Cover Depth (m)	3.000	Time to Half Empty	x
Backdrops	✓	Discharge Rates	✓
Minimum Backdrop Height (m)		Discharge Volume	✓
Maximum Backdrop Height (m)	1.500	100 year 360 minute (m ³)	
Full Bore Velocity	✓		

Results for 1 year Critical Storm Duration. Lowest mass balance: 99.69%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	1	10	118.471	0.022	2.2	0.0287	0.0000	OK
15 minute summer	2	10	117.174	0.030	4.2	0.0376	0.0000	OK
15 minute summer	3	10	115.498	0.038	6.7	0.0490	0.0000	OK
15 minute summer	4	10	114.313	0.038	2.3	0.0502	0.0000	OK
15 minute summer	5	10	114.238	0.050	12.1	0.0651	0.0000	OK
15 minute summer	6	10	114.586	0.040	6.8	0.0654	0.0000	OK
15 minute summer	7	10	113.558	0.069	22.8	0.0952	0.0000	OK
15 minute summer	8	10	112.932	0.057	6.7	0.0961	0.0000	OK
15 minute summer	9	10	112.344	0.083	33.1	0.1143	0.0000	OK
15 minute summer	10	10	111.619	0.034	5.5	0.0548	0.0000	OK
15 minute summer	11	10	111.178	0.120	47.1	0.1871	0.0000	OK
180 minute summer	12	92	108.869	0.037	3.6	0.0437	0.0000	OK
15 minute summer	13	10	110.168	0.043	7.7	0.0774	0.0000	OK
30 minute summer	14	18	108.762	0.052	13.6	0.0672	0.0000	OK
15 minute summer	15	10	108.972	0.057	10.7	0.1164	0.0000	OK
15 minute summer	16	10	107.933	0.091	30.4	0.1346	0.0000	OK
120 minute summer	PP NE1	70	115.724	0.024	1.5	1.1455	0.0000	OK
15 minute summer	18	10	107.252	0.177	50.1	0.3948	0.0000	OK
15 minute summer	19	10	107.623	0.068	6.8	0.1161	0.0000	OK
60 minute summer	20	38	107.234	0.281	51.6	0.4360	0.0000	OK
15 minute summer	21	10	108.103	0.048	6.7	0.0858	0.0000	OK
60 minute summer	22	38	107.229	0.366	56.7	0.4423	0.0000	OK
15 minute summer	23	10	107.942	0.067	6.7	0.1249	0.0000	OK
120 minute summer	24	72	107.015	0.246	41.1	0.3296	0.0000	OK
15 minute summer	25	10	107.303	0.048	6.6	0.0814	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	2	2.2	1.095	0.020	0.0183	
15 minute summer	2	2	17	4.2	1.312	0.038	0.0428	
15 minute summer	3	3	5	6.7	1.525	0.060	0.0660	
15 minute summer	4	4	5	2.3	0.422	0.063	0.0944	
15 minute summer	5	5	7	12.0	1.445	0.108	0.1289	
15 minute summer	6	6	7	6.8	1.459	0.065	0.0586	
15 minute summer	7	7	9	22.8	1.930	0.204	0.3193	
15 minute summer	8	8	9	6.7	0.884	0.129	0.1033	
15 minute summer	9	9	11	32.9	1.886	0.296	0.4629	
15 minute summer	10	10	11	5.5	0.516	0.051	0.1566	
15 minute summer	11	11	41	46.6	2.398	0.418	0.1260	
180 minute summer	12	12	14	3.6	0.810	0.032	0.0675	
15 minute summer	13	13	14	7.7	1.478	0.076	0.0621	
30 minute summer	14	14	16	13.5	1.073	0.067	0.3455	
15 minute summer	15	15	16	10.7	1.392	0.131	0.1064	
15 minute summer	16	16	18	30.4	1.583	0.198	0.7112	
120 minute summer	PP NE1	PP NE1	5	0.9	0.673	0.120	0.0211	
15 minute summer	18	18	20	48.4	0.852	0.421	2.1063	
15 minute summer	19	19	20	6.8	0.692	0.185	0.1358	
60 minute summer	20	20	22	46.3	0.673	0.403	2.6691	
15 minute summer	21	21	22	6.7	1.126	0.091	0.0608	
60 minute summer	22	22	43	53.6	0.607	0.467	0.8045	
15 minute summer	23	23	24	6.7	0.690	0.183	0.1355	
120 minute summer	24	24	26	40.1	0.566	0.250	2.8312	
15 minute summer	25	25	26	6.6	1.080	0.096	0.1168	

Results for 1 year Critical Storm Duration. Lowest mass balance: 99.69%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
120 minute summer	26	72	107.007	0.307	45.9	0.4756	0.0000	OK
15 minute summer	27	10	107.111	0.056	8.2	0.1028	0.0000	OK
720 minute summer	28	450	106.873	0.269	26.7	0.3508	0.0000	OK
15 minute summer	29	10	107.997	0.082	10.8	0.1677	0.0000	OK
720 minute summer	30	450	106.873	0.347	30.3	0.5211	0.0000	OK
720 minute summer	31	450	106.872	0.398	32.0	0.4807	0.0000	OK
15 minute summer	17	10	116.567	0.031	4.2	0.0346	0.0000	OK
15 minute summer	33	1	115.113	0.000	0.0	0.0000	0.0000	OK
15 minute summer	34	10	112.838	0.041	8.1	0.0651	0.0000	OK
15 minute summer	35	10	111.481	0.043	8.1	0.0481	0.0000	OK
15 minute summer	36	10	109.915	0.042	8.6	0.0486	0.0000	OK
15 minute summer	37	10	110.422	0.022	1.3	0.0268	0.0000	OK
30 minute summer	38	18	109.561	0.056	14.3	0.0733	0.0000	OK
720 minute summer	39	450	106.871	0.434	36.1	0.5382	0.0000	OK
720 minute summer	out fall	450	106.291	0.091	21.8	0.0000	0.0000	OK
15 minute summer	41	10	110.171	0.108	47.1	0.1246	0.0000	OK
960 minute summer	Tree pits 3	630	109.476	0.606	11.1	69.9845	0.0000	SURCHARGED
60 minute summer	43	38	107.224	0.385	54.5	0.4618	0.0000	SURCHARGED
60 minute summer	Tree pits 2	39	107.220	0.406	57.2	18.8646	0.0000	OK
60 minute summer	45	40	107.022	0.228	41.1	0.2761	0.0000	OK
120 minute summer	46	72	107.001	0.367	49.2	0.4569	0.0000	OK
120 minute summer	Tree pits 1	72	106.999	0.381	49.7	15.4398	0.0000	OK
720 minute summer	Tree Pits 4	450	106.871	0.471	38.7	158.4440	0.0000	SURCHARGED
30 minute summer	PP NE2	20	112.257	0.057	8.7	2.4072	0.0000	OK
60 minute summer	PP NE3	36	108.562	0.062	7.1	2.8019	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	26	26	46	44.2	0.424	0.275	3.3488	
15 minute summer	27	27	28	8.2	1.089	0.127	0.1014	
720 minute summer	28	28	30	26.4	0.629	0.142	2.6783	
15 minute summer	29	29	30	10.8	0.855	0.262	0.2007	
720 minute summer	30	30	31	29.8	0.566	0.185	2.9180	
720 minute summer	31	31	39	31.6	0.557	0.170	1.7071	
15 minute summer	17	17	3	4.2	1.328	0.038	0.0355	
15 minute summer	33	33	34	0.0	0.000	0.000	0.0000	
15 minute summer	34	34	35	8.1	1.594	0.073	0.1522	
15 minute summer	35	35	36	8.1	1.600	0.073	0.0571	
15 minute summer	36	36	38	8.6	1.152	0.043	0.0856	
15 minute summer	37	37	38	1.3	0.661	0.019	0.0415	
30 minute summer	38	38	39	14.3	1.622	0.071	0.1489	
720 minute summer	39	39	Tree Pits 4	35.9	0.817	0.144	0.9793	
15 minute summer	41	41	Tree pits 3	46.8	2.596	0.421	0.1852	
960 minute summer	Tree pits 3	Hydro-Brake®	12	3.2				
60 minute summer	43	43	Tree pits 2	53.0	1.057	0.462	0.8372	
60 minute summer	Tree pits 2	Hydro-Brake®	45	40.3				
60 minute summer	45	45	24	40.6	0.634	0.252	0.8600	
120 minute summer	46	46	Tree pits 1	48.6	0.664	0.303	0.8795	
120 minute summer	Tree pits 1	Hydro-Brake®	28	48.6				
720 minute summer	Tree Pits 4	Basin 0	dba	22.2	0.448	0.313	0.1408	
30 minute summer	PP NE2	PP NE2	11	5.1	1.115	0.600	0.0583	
60 minute summer	PP NE3	PP NE3	18	4.6	0.911	0.685	0.1104	

Results for 1 year Critical Storm Duration. Lowest mass balance: 99.69%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute summer	PP NE4	36	108.639	0.059	7.1	2.6869	0.0000	OK
60 minute summer	PP NE5	36	107.939	0.059	7.4	2.7061	0.0000	OK
30 minute summer	PP NE6	20	109.361	0.060	8.9	2.4936	0.0000	OK
60 minute summer	PP NE7	35	111.004	0.039	4.3	1.5596	0.0000	OK
720 minute summer	dba	450	106.870	0.470	22.2	16.9269	0.0000	SURCHARGED
720 minute summer	DB B	450	106.593	0.293	21.8	10.8500	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)
60 minute summer	PP NE4	13.000	22	4.8	1.027	0.614	0.0296	
60 minute summer	PP NE5	PP NE5	46	5.2	1.083	0.633	0.0511	
30 minute summer	PP NE6	PP NE6	31	5.1	1.046	0.642	0.0380	
60 minute summer	PP NE7	PP NE7	38	3.1	1.141	0.305	0.0320	
720 minute summer	dba	Hydro-Brake®	DB B	21.8				
720 minute summer	DB B	1.029	out fall	21.8	1.200	0.206	0.1998	578.8

Results for 5 year Critical Storm Duration. Lowest mass balance: 99.69%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	1	10	118.476	0.027	3.3	0.0350	0.0000	OK
15 minute summer	2	10	117.181	0.037	6.4	0.0462	0.0000	OK
15 minute summer	3	10	115.507	0.047	10.1	0.0604	0.0000	OK
15 minute summer	4	10	114.322	0.047	3.5	0.0618	0.0000	OK
15 minute summer	5	10	114.250	0.062	18.6	0.0809	0.0000	OK
15 minute summer	6	10	114.595	0.049	10.2	0.0805	0.0000	OK
15 minute summer	7	10	113.575	0.086	34.8	0.1190	0.0000	OK
15 minute summer	8	10	112.946	0.071	10.2	0.1203	0.0000	OK
15 minute summer	9	10	112.367	0.105	50.5	0.1445	0.0000	OK
15 minute summer	10	10	111.627	0.042	8.3	0.0670	0.0000	OK
15 minute summer	11	10	111.223	0.165	72.6	0.2565	0.0000	OK
30 minute summer	12	18	108.872	0.040	4.3	0.0468	0.0000	OK
15 minute summer	13	10	110.179	0.054	11.7	0.0962	0.0000	OK
15 minute summer	14	10	108.774	0.064	20.7	0.0825	0.0000	OK
15 minute summer	15	10	108.987	0.072	16.2	0.1455	0.0000	OK
15 minute summer	16	10	107.954	0.112	46.3	0.1655	0.0000	OK
60 minute summer	PP NE1	37	115.731	0.031	3.0	1.5014	0.0000	OK
60 minute summer	18	37	107.449	0.374	59.7	0.8328	0.0000	OK
15 minute summer	19	10	107.640	0.085	10.3	0.1456	0.0000	OK
60 minute summer	20	37	107.434	0.481	66.5	0.7465	0.0000	SURCHARGED
15 minute summer	21	10	108.115	0.060	10.2	0.1071	0.0000	OK
60 minute summer	22	38	107.417	0.554	76.4	0.6694	0.0000	SURCHARGED
15 minute summer	23	10	107.960	0.085	10.2	0.1570	0.0000	OK
600 minute summer	24	375	107.180	0.411	28.4	0.5517	0.0000	OK
15 minute summer	25	10	107.315	0.060	10.0	0.1010	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	2	3.3	1.232	0.030	0.0244	
15 minute summer	2	2	17	6.4	1.474	0.057	0.0581	
15 minute summer	3	3	5	10.1	1.715	0.091	0.0886	
15 minute summer	4	4	5	3.5	0.476	0.095	0.1278	
15 minute summer	5	5	7	18.5	1.637	0.166	0.1751	
15 minute summer	6	6	7	10.2	1.635	0.098	0.0784	
15 minute summer	7	7	9	34.8	2.163	0.312	0.4347	
15 minute summer	8	8	9	10.2	0.991	0.196	0.1404	
15 minute summer	9	9	11	50.3	2.025	0.452	0.6546	
15 minute summer	10	10	11	8.3	0.561	0.077	0.2237	
15 minute summer	11	11	41	71.9	2.600	0.645	0.1789	
30 minute summer	12	12	14	4.3	0.810	0.039	0.0990	
15 minute summer	13	13	14	11.7	1.659	0.115	0.0841	
15 minute summer	14	14	16	20.6	1.196	0.103	0.4689	
15 minute summer	15	15	16	16.2	1.555	0.198	0.1443	
15 minute summer	16	16	18	46.0	1.584	0.300	1.1600	
60 minute summer	PP NE1	PP NE1	5	1.6	0.782	0.203	0.0307	
60 minute summer	18	18	20	52.1	0.790	0.453	4.0303	
15 minute summer	19	19	20	10.3	0.774	0.281	0.1844	
60 minute summer	20	20	22	61.5	0.636	0.535	2.9724	
15 minute summer	21	21	22	10.2	1.261	0.138	0.0826	
60 minute summer	22	22	43	75.7	0.686	0.659	0.8072	
15 minute summer	23	23	24	10.2	0.773	0.279	0.1846	
600 minute summer	24	24	26	27.6	0.510	0.172	4.3106	
15 minute summer	25	25	26	10.0	1.212	0.146	0.1689	

Results for 5 year Critical Storm Duration. Lowest mass balance: 99.69%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
600 minute summer	26	375	107.180	0.480	31.6	0.7425	0.0000	SURCHARGED
15 minute summer	27	10	107.125	0.070	12.4	0.1283	0.0000	OK
720 minute summer	28	450	107.051	0.447	31.8	0.5814	0.0000	OK
15 minute summer	29	10	108.019	0.104	16.4	0.2128	0.0000	OK
720 minute summer	30	450	107.049	0.523	36.7	0.7866	0.0000	SURCHARGED
720 minute summer	31	450	107.048	0.574	39.2	0.6935	0.0000	SURCHARGED
15 minute summer	17	10	116.574	0.038	6.4	0.0427	0.0000	OK
15 minute summer	33	1	115.113	0.000	0.0	0.0000	0.0000	OK
15 minute summer	34	10	112.848	0.051	12.3	0.0802	0.0000	OK
15 minute summer	35	10	111.491	0.053	12.3	0.0598	0.0000	OK
15 minute summer	36	10	109.925	0.052	13.0	0.0594	0.0000	OK
15 minute summer	37	10	110.426	0.026	1.9	0.0323	0.0000	OK
15 minute summer	38	10	109.576	0.071	22.5	0.0924	0.0000	OK
720 minute summer	39	465	107.048	0.611	44.8	0.7568	0.0000	SURCHARGED
720 minute summer	out fall	465	106.297	0.097	24.2	0.0000	0.0000	OK
15 minute summer	41	10	110.206	0.143	72.7	0.1650	0.0000	OK
960 minute summer	Tree pits 3	660	109.836	0.966	14.9	111.5433	0.0000	SURCHARGED
60 minute summer	43	38	107.406	0.567	76.9	0.6800	0.0000	SURCHARGED
60 minute summer	Tree pits 2	39	107.398	0.584	81.6	27.1109	0.0000	SURCHARGED
600 minute summer	45	375	107.181	0.387	25.5	0.4684	0.0000	OK
600 minute summer	46	375	107.179	0.545	33.9	0.6774	0.0000	SURCHARGED
600 minute summer	Tree pits 1	375	107.178	0.560	34.3	22.7002	0.0000	SURCHARGED
720 minute summer	Tree Pits 4	465	107.047	0.647	48.4	217.5491	0.0000	SURCHARGED
30 minute summer	PP NE2	20	112.279	0.079	13.1	3.3288	0.0000	OK
30 minute summer	PP NE3	20	108.584	0.084	13.4	3.8164	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)
600 minute summer	26	26	46	30.5	0.348	0.190	4.1808	
15 minute summer	27	27	28	12.4	1.218	0.193	0.1373	
720 minute summer	28	28	30	31.4	0.609	0.169	3.6861	
15 minute summer	29	29	30	16.4	0.952	0.399	0.2739	
720 minute summer	30	30	31	36.0	0.538	0.224	3.3099	
720 minute summer	31	31	39	38.8	0.568	0.209	1.7731	
15 minute summer	17	17	3	6.4	1.497	0.057	0.0480	
15 minute summer	33	33	34	0.0	0.000	0.000	0.0000	
15 minute summer	34	34	35	12.3	1.786	0.110	0.2062	
15 minute summer	35	35	36	12.3	1.796	0.110	0.0773	
15 minute summer	36	36	38	13.0	1.271	0.065	0.1175	
15 minute summer	37	37	38	1.9	0.743	0.028	0.0546	
15 minute summer	38	38	39	22.3	1.831	0.111	0.2052	
720 minute summer	39	39	Tree Pits 4	44.6	0.907	0.179	0.9844	
15 minute summer	41	41	Tree pits 3	72.4	2.861	0.650	0.2597	
960 minute summer	Tree pits 3	Hydro-Brake®	12	3.2				
60 minute summer	43	43	Tree pits 2	76.1	1.144	0.662	0.8372	
60 minute summer	Tree pits 2	Hydro-Brake®	45	56.1				
600 minute summer	45	45	24	25.3	0.588	0.157	1.5099	
600 minute summer	46	46	Tree pits 1	33.4	0.479	0.208	0.9896	
600 minute summer	Tree pits 1	Hydro-Brake®	28	30.9				
720 minute summer	Tree Pits 4	Basin 0	dba	25.1	0.475	0.356	0.1408	
30 minute summer	PP NE2	PP NE2	11	7.9	1.205	0.926	0.0832	
30 minute summer	PP NE3	PP NE3	18	6.7	0.961	0.998	0.1537	

Results for 5 year Critical Storm Duration. Lowest mass balance: 99.69%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
30 minute summer	PP NE4	20	108.662	0.081	13.4	3.7029	0.0000	OK
30 minute summer	PP NE5	20	107.963	0.083	14.0	3.7607	0.0000	OK
30 minute summer	PP NE6	20	109.385	0.085	13.3	3.4878	0.0000	OK
30 minute summer	PP NE7	20	111.016	0.051	8.2	2.0750	0.0000	OK
720 minute summer	dba	465	107.046	0.646	25.1	23.2452	0.0000	SURCHARGED
720 minute summer	DB B	465	106.625	0.325	24.3	12.0184	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)
30 minute summer	PP NE4	13.000	22	7.3	1.103	0.930	0.0417	
30 minute summer	PP NE5	PP NE5	46	7.8	1.158	0.962	0.0764	
30 minute summer	PP NE6	PP NE6	31	7.6	1.115	0.963	0.0563	
30 minute summer	PP NE7	PP NE7	38	5.2	1.297	0.503	0.0464	
720 minute summer	dba	Hydro-Brake®	DB B	24.3				
720 minute summer	DB B	1.029	out fall	24.2	1.236	0.229	0.2161	750.3

Results for 10 year Critical Storm Duration. Lowest mass balance: 99.69%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	1	10	118.478	0.029	3.8	0.0375	0.0000	OK
15 minute summer	2	10	117.184	0.040	7.4	0.0497	0.0000	OK
15 minute summer	3	10	115.511	0.051	11.7	0.0652	0.0000	OK
15 minute summer	4	10	114.325	0.050	4.1	0.0668	0.0000	OK
15 minute summer	5	10	114.255	0.067	21.7	0.0875	0.0000	OK
15 minute summer	6	10	114.599	0.053	11.8	0.0869	0.0000	OK
15 minute summer	7	10	113.582	0.093	40.4	0.1294	0.0000	OK
15 minute summer	8	10	112.952	0.077	11.8	0.1303	0.0000	OK
15 minute summer	9	10	112.376	0.115	58.5	0.1576	0.0000	OK
15 minute summer	10	10	111.630	0.045	9.6	0.0719	0.0000	OK
15 minute summer	11	10	111.247	0.189	84.5	0.2937	0.0000	OK
30 minute summer	12	18	108.874	0.042	4.7	0.0486	0.0000	OK
15 minute summer	13	10	110.183	0.058	13.5	0.1038	0.0000	OK
15 minute summer	14	10	108.778	0.069	23.5	0.0881	0.0000	OK
15 minute summer	15	10	108.992	0.077	18.7	0.1574	0.0000	OK
15 minute summer	16	10	107.962	0.120	53.2	0.1785	0.0000	OK
60 minute summer	PP NE1	37	115.735	0.035	3.5	1.6834	0.0000	OK
60 minute summer	18	36	107.574	0.499	68.9	1.1113	0.0000	SURCHARGED
15 minute summer	19	10	107.648	0.093	11.9	0.1581	0.0000	OK
60 minute summer	20	37	107.552	0.599	81.2	0.9299	0.0000	SURCHARGED
15 minute summer	21	10	108.120	0.065	11.8	0.1159	0.0000	OK
60 minute summer	22	38	107.530	0.667	97.4	0.8053	0.0000	SURCHARGED
15 minute summer	23	10	107.967	0.092	11.8	0.1705	0.0000	OK
600 minute summer	24	375	107.284	0.515	30.6	0.6903	0.0000	SURCHARGED
15 minute summer	25	10	107.319	0.064	11.5	0.1088	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	2	3.8	1.285	0.034	0.0269	
15 minute summer	2	2	17	7.4	1.533	0.066	0.0646	
15 minute summer	3	3	5	11.7	1.787	0.105	0.0986	
15 minute summer	4	4	5	4.1	0.499	0.112	0.1427	
15 minute summer	5	5	7	21.6	1.705	0.194	0.1957	
15 minute summer	6	6	7	11.8	1.701	0.113	0.0872	
15 minute summer	7	7	9	40.3	2.244	0.362	0.4861	
15 minute summer	8	8	9	11.8	1.029	0.227	0.1564	
15 minute summer	9	9	11	58.4	2.070	0.524	0.7413	
15 minute summer	10	10	11	9.6	0.569	0.089	0.2542	
15 minute summer	11	11	41	83.5	2.649	0.750	0.2028	
30 minute summer	12	12	14	4.7	0.810	0.042	0.1074	
15 minute summer	13	13	14	13.5	1.724	0.133	0.0933	
15 minute summer	14	14	16	23.5	1.233	0.117	0.5179	
15 minute summer	15	15	16	18.7	1.614	0.229	0.1604	
15 minute summer	16	16	18	53.0	1.595	0.345	1.6255	
60 minute summer	PP NE1	PP NE1	5	2.0	0.830	0.252	0.0360	
60 minute summer	18	18	20	64.0	0.784	0.557	4.0324	
15 minute summer	19	19	20	11.9	0.803	0.325	0.2053	
60 minute summer	20	20	22	79.8	0.723	0.694	2.9724	
15 minute summer	21	21	22	11.8	1.311	0.160	0.0920	
60 minute summer	22	22	43	96.2	0.872	0.837	0.8072	
15 minute summer	23	23	24	11.8	0.803	0.322	0.2058	
600 minute summer	24	24	26	29.8	0.510	0.185	4.4011	
15 minute summer	25	25	26	11.5	1.260	0.168	0.2723	

Results for 10 year Critical Storm Duration. Lowest mass balance: 99.69%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
600 minute summer	26	375	107.283	0.583	34.3	0.9020	0.0000	SURCHARGED
600 minute summer	27	390	107.151	0.096	2.8	0.1747	0.0000	OK
600 minute summer	28	390	107.151	0.547	37.5	0.7118	0.0000	SURCHARGED
15 minute summer	29	10	108.028	0.113	18.9	0.2316	0.0000	OK
600 minute summer	30	390	107.150	0.623	43.3	0.9371	0.0000	SURCHARGED
600 minute summer	31	390	107.148	0.674	46.5	0.8143	0.0000	SURCHARGED
15 minute summer	17	10	116.577	0.041	7.4	0.0460	0.0000	OK
15 minute summer	33	1	115.113	0.000	0.0	0.0000	0.0000	OK
15 minute summer	34	10	112.852	0.055	14.2	0.0862	0.0000	OK
15 minute summer	35	10	111.495	0.057	14.2	0.0645	0.0000	OK
15 minute summer	36	10	109.928	0.055	15.0	0.0637	0.0000	OK
15 minute summer	37	10	110.428	0.028	2.2	0.0347	0.0000	OK
15 minute summer	38	10	109.582	0.077	26.3	0.1003	0.0000	OK
600 minute summer	39	390	107.147	0.710	53.7	0.8797	0.0000	SURCHARGED
600 minute summer	out fall	420	106.298	0.098	24.8	0.0000	0.0000	OK
15 minute summer	41	10	110.223	0.159	84.4	0.1844	0.0000	OK
1440 minute summer	Tree pits 3	960	109.995	1.125	12.8	129.9123	0.0000	SURCHARGED
60 minute summer	43	38	107.515	0.676	97.8	0.8106	0.0000	SURCHARGED
60 minute summer	Tree pits 2	38	107.504	0.690	103.7	32.0349	0.0000	SURCHARGED
600 minute summer	45	375	107.284	0.490	27.4	0.5938	0.0000	SURCHARGED
600 minute summer	46	375	107.281	0.647	37.2	0.8053	0.0000	SURCHARGED
600 minute summer	Tree pits 1	375	107.281	0.663	38.1	26.8632	0.0000	SURCHARGED
600 minute summer	Tree Pits 4	390	107.146	0.746	58.3	251.0634	0.0000	SURCHARGED
30 minute summer	PP NE2	20	112.290	0.090	15.2	3.8064	0.0000	OK
30 minute summer	PP NE3	21	108.598	0.098	15.5	4.4462	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)
600 minute summer	26	26	46	33.3	0.347	0.207	4.1808	
600 minute summer	27	27	28	2.8	0.803	0.043	0.3763	
600 minute summer	28	28	30	36.8	0.624	0.198	3.6884	
15 minute summer	29	29	30	18.9	0.985	0.460	0.3049	
600 minute summer	30	30	31	42.6	0.557	0.265	3.3099	
600 minute summer	31	31	39	46.3	0.590	0.249	1.7731	
15 minute summer	17	17	3	7.4	1.560	0.066	0.0533	
15 minute summer	33	33	34	0.0	0.000	0.000	0.0000	
15 minute summer	34	34	35	14.2	1.854	0.127	0.2292	
15 minute summer	35	35	36	14.2	1.867	0.128	0.0858	
15 minute summer	36	36	38	15.0	1.313	0.075	0.1313	
15 minute summer	37	37	38	2.2	0.776	0.032	0.0605	
15 minute summer	38	38	39	26.0	1.910	0.130	0.2301	
600 minute summer	39	39	Tree Pits 4	53.6	0.955	0.215	0.9844	
15 minute summer	41	41	Tree pits 3	84.1	2.941	0.755	0.2931	
1440 minute summer	Tree pits 3	Hydro-Brake®	12	3.2				
60 minute summer	43	43	Tree pits 2	96.5	1.236	0.840	0.8372	
60 minute summer	Tree pits 2	Hydro-Brake®	45	63.6				
600 minute summer	45	45	24	27.0	0.591	0.168	1.6115	
600 minute summer	46	46	Tree pits 1	37.1	0.469	0.231	0.9896	
600 minute summer	Tree pits 1	Hydro-Brake®	28	33.8				
600 minute summer	Tree Pits 4	Basin 0	dba	26.8	0.526	0.379	0.1408	
30 minute summer	PP NE2	PP NE2	11	8.7	1.207	1.028	0.0956	
30 minute summer	PP NE3	PP NE3	18	7.0	0.961	1.052	0.1634	

Results for 10 year Critical Storm Duration. Lowest mass balance: 99.69%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
30 minute summer	PP NE4	20	108.674	0.094	15.5	4.2638	0.0000	OK
30 minute summer	PP NE5	20	107.975	0.095	16.3	4.3362	0.0000	OK
30 minute summer	PP NE6	20	109.398	0.098	15.4	4.0409	0.0000	OK
30 minute summer	PP NE7	20	111.022	0.057	9.5	2.3110	0.0000	OK
600 minute summer	dba	390	107.145	0.745	26.8	26.8284	0.0000	SURCHARGED
600 minute summer	DB B	420	106.660	0.360	25.0	13.3321	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)
30 minute summer	PP NE4	13.000	22	8.0	1.104	1.013	0.0472	
30 minute summer	PP NE5	PP NE5	46	8.4	1.159	1.033	0.0812	
30 minute summer	PP NE6	PP NE6	31	8.1	1.116	1.024	0.0595	
30 minute summer	PP NE7	PP NE7	38	6.2	1.350	0.598	0.0530	
600 minute summer	dba	Hydro-Brake®	DB B	25.0				
600 minute summer	DB B	1.029	out fall	24.8	1.244	0.234	0.2196	751.6

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.69%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	1	10	118.482	0.033	4.8	0.0421	0.0000	OK
15 minute summer	2	10	117.189	0.045	9.4	0.0561	0.0000	OK
15 minute summer	3	10	115.518	0.058	14.9	0.0740	0.0000	OK
15 minute summer	4	10	114.332	0.057	5.2	0.0753	0.0000	OK
15 minute summer	5	10	114.264	0.076	27.7	0.0993	0.0000	OK
15 minute summer	6	10	114.606	0.060	15.0	0.0987	0.0000	OK
15 minute summer	7	10	113.597	0.108	51.5	0.1492	0.0000	OK
15 minute summer	8	10	112.963	0.088	15.0	0.1489	0.0000	OK
15 minute summer	9	10	112.395	0.134	74.5	0.1835	0.0000	OK
15 minute summer	10	10	111.636	0.051	12.1	0.0807	0.0000	OK
15 minute summer	11	10	111.401	0.343	107.0	0.5329	0.0000	SURCHARGED
30 minute summer	12	18	108.876	0.044	5.2	0.0511	0.0000	OK
15 minute summer	13	10	110.191	0.066	17.1	0.1179	0.0000	OK
15 minute summer	14	10	108.786	0.077	29.3	0.0984	0.0000	OK
15 minute summer	15	10	109.004	0.089	23.7	0.1800	0.0000	OK
15 minute summer	16	10	107.979	0.137	66.9	0.2032	0.0000	OK
60 minute summer	PP NE1	36	115.741	0.041	4.4	1.9807	0.0000	OK
30 minute summer	18	19	107.823	0.748	106.7	1.6661	0.0000	SURCHARGED
60 minute summer	19	36	107.780	0.225	11.1	0.3844	0.0000	SURCHARGED
60 minute summer	20	36	107.777	0.824	102.1	1.2802	0.0000	SURCHARGED
15 minute summer	21	10	108.129	0.074	15.0	0.1323	0.0000	OK
60 minute summer	22	37	107.738	0.875	118.0	1.0574	0.0000	SURCHARGED
15 minute summer	23	10	107.981	0.105	14.9	0.1953	0.0000	OK
600 minute summer	24	390	107.495	0.726	37.1	0.9741	0.0000	SURCHARGED
600 minute summer	25	390	107.494	0.239	2.7	0.4040	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	2	4.8	1.374	0.043	0.0318	
15 minute summer	2	2	17	9.4	1.636	0.084	0.0769	
15 minute summer	3	3	5	14.9	1.909	0.134	0.1176	
15 minute summer	4	4	5	5.2	0.532	0.142	0.1698	
15 minute summer	5	5	7	27.6	1.812	0.248	0.2349	
15 minute summer	6	6	7	15.0	1.815	0.144	0.1039	
15 minute summer	7	7	9	51.4	2.369	0.462	0.5864	
15 minute summer	8	8	9	15.0	1.095	0.289	0.1868	
15 minute summer	9	9	11	74.0	2.091	0.664	0.8522	
15 minute summer	10	10	11	12.1	0.627	0.112	0.2860	
15 minute summer	11	11	41	102.8	2.702	0.923	0.2328	
30 minute summer	12	12	14	5.2	0.810	0.047	0.1232	
15 minute summer	13	13	14	17.1	1.837	0.169	0.1110	
15 minute summer	14	14	16	29.2	1.299	0.146	0.6117	
15 minute summer	15	15	16	23.7	1.714	0.290	0.1914	
15 minute summer	16	16	18	66.8	1.550	0.435	1.8503	
60 minute summer	PP NE1	PP NE1	5	2.7	0.900	0.339	0.0447	
30 minute summer	18	18	20	99.6	0.903	0.867	4.0324	
60 minute summer	19	19	20	11.2	0.772	0.307	0.5503	
60 minute summer	20	20	22	96.7	0.877	0.841	2.9724	
15 minute summer	21	21	22	15.0	1.395	0.204	0.1099	
60 minute summer	22	22	43	116.0	1.052	1.009	0.8072	
15 minute summer	23	23	24	14.9	0.851	0.407	0.2451	
600 minute summer	24	24	26	36.9	0.506	0.229	4.4011	
600 minute summer	25	25	26	2.7	0.726	0.039	0.7609	

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.69%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
600 minute summer	26	390	107.494	0.794	42.3	1.2296	0.0000	SURCHARGED
600 minute summer	27	405	107.359	0.304	3.4	0.5552	0.0000	SURCHARGED
600 minute summer	28	405	107.359	0.755	46.1	0.9833	0.0000	SURCHARGED
15 minute summer	29	10	108.046	0.131	24.0	0.2689	0.0000	OK
600 minute summer	30	405	107.358	0.832	53.6	1.2505	0.0000	SURCHARGED
600 minute summer	31	405	107.357	0.883	58.1	1.0663	0.0000	SURCHARGED
15 minute summer	17	10	116.582	0.046	9.4	0.0520	0.0000	OK
15 minute summer	33	1	115.113	0.000	0.0	0.0000	0.0000	OK
15 minute summer	34	10	112.859	0.062	18.1	0.0976	0.0000	OK
15 minute summer	35	10	111.503	0.065	18.1	0.0735	0.0000	OK
15 minute summer	36	10	109.936	0.063	19.2	0.0724	0.0000	OK
15 minute summer	37	10	110.432	0.032	2.8	0.0390	0.0000	OK
15 minute summer	38	10	109.593	0.088	34.1	0.1155	0.0000	OK
600 minute summer	39	405	107.356	0.919	66.9	1.1383	0.0000	SURCHARGED
720 minute summer	out fall	540	106.299	0.099	25.4	0.0000	0.0000	OK
1440 minute summer	41	960	110.306	0.242	13.7	0.2803	0.0000	SURCHARGED
1440 minute summer	Tree pits 3	960	110.305	1.435	15.2	165.6574	0.0000	SURCHARGED
60 minute summer	43	38	107.715	0.876	118.1	1.0498	0.0000	SURCHARGED
60 minute summer	Tree pits 2	38	107.698	0.884	125.6	41.0465	0.0000	SURCHARGED
600 minute summer	45	390	107.496	0.702	32.9	0.8500	0.0000	SURCHARGED
600 minute summer	46	390	107.493	0.859	46.6	1.0686	0.0000	SURCHARGED
600 minute summer	Tree pits 1	390	107.493	0.875	47.6	32.4572	0.0000	SURCHARGED
600 minute summer	Tree Pits 4	405	107.355	0.955	72.5	321.2978	0.0000	SURCHARGED
30 minute summer	PP NE2	21	112.322	0.122	19.4	5.1176	0.0000	SURCHARGED
60 minute summer	PP NE3	38	108.632	0.132	15.3	5.9953	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)
600 minute summer	26	26	46	41.9	0.379	0.261	4.1808	
600 minute summer	27	27	28	3.4	0.795	0.053	0.5359	
600 minute summer	28	28	30	45.8	0.607	0.246	3.6884	
15 minute summer	29	29	30	24.0	1.042	0.584	0.3661	
600 minute summer	30	30	31	53.4	0.563	0.332	3.3099	
600 minute summer	31	31	39	57.9	0.602	0.312	1.7731	
15 minute summer	17	17	3	9.4	1.669	0.084	0.0633	
15 minute summer	33	33	34	0.0	0.000	0.000	0.0000	
15 minute summer	34	34	35	18.1	1.975	0.162	0.2742	
15 minute summer	35	35	36	18.1	1.991	0.163	0.1026	
15 minute summer	36	36	38	19.2	1.387	0.096	0.1591	
15 minute summer	37	37	38	2.8	0.835	0.041	0.0718	
15 minute summer	38	38	39	33.8	2.048	0.169	0.2788	
600 minute summer	39	39	Tree Pits 4	66.7	0.989	0.268	0.9844	
1440 minute summer	41	41	Tree pits 3	13.7	1.871	0.123	0.4081	
1440 minute summer	Tree pits 3	Hydro-Brake®	12	3.5				
60 minute summer	43	43	Tree pits 2	116.3	1.285	1.012	0.8372	
60 minute summer	Tree pits 2	Hydro-Brake®	45	80.0				
600 minute summer	45	45	24	32.8	0.590	0.204	1.6115	
600 minute summer	46	46	Tree pits 1	46.4	0.517	0.289	0.9896	
600 minute summer	Tree pits 1	Hydro-Brake®	28	41.6				
600 minute summer	Tree Pits 4	Basin 0	dba	29.0	0.554	0.411	0.1408	
30 minute summer	PP NE2	PP NE2	11	8.8	1.205	1.036	0.0979	
60 minute summer	PP NE3	PP NE3	18	7.3	0.961	1.096	0.1651	

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.69%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
30 minute summer	PP NE4	21	108.704	0.124	19.8	5.6374	0.0000	SURCHARGED
30 minute summer	PP NE5	21	108.009	0.129	20.7	5.8566	0.0000	SURCHARGED
30 minute summer	PP NE6	21	109.431	0.131	19.7	5.4206	0.0000	SURCHARGED
30 minute summer	PP NE7	19	111.034	0.069	12.1	2.7828	0.0000	OK
600 minute summer	dba	405	107.354	0.954	29.0	34.3425	0.0000	SURCHARGED
720 minute summer	DB B	540	106.754	0.454	25.8	16.8052	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)
30 minute summer	PP NE4	13.000	22	8.4	1.104	1.071	0.0481	
30 minute summer	PP NE5	PP NE5	46	8.6	1.156	1.049	0.0820	
30 minute summer	PP NE6	PP NE6	31	8.5	1.116	1.080	0.0600	
30 minute summer	PP NE7	PP NE7	38	8.0	1.425	0.780	0.0656	
600 minute summer	dba	Hydro-Brake®	DB B	25.8				
720 minute summer	DB B	1.029	out fall	25.4	1.252	0.240	0.2232	968.9

Results for 100 year +20% CC Critical Storm Duration. Lowest mass balance: 99.69%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	1	10	118.490	0.041	7.5	0.0528	0.0000	OK
15 minute summer	2	10	117.201	0.057	14.6	0.0704	0.0000	OK
15 minute summer	3	10	115.533	0.073	23.1	0.0937	0.0000	OK
15 minute summer	4	10	114.346	0.071	8.0	0.0939	0.0000	OK
15 minute summer	5	10	114.285	0.097	43.6	0.1270	0.0000	OK
15 minute summer	6	10	114.623	0.077	23.4	0.1259	0.0000	OK
15 minute summer	7	10	113.661	0.172	80.8	0.2383	0.0000	OK
15 minute summer	8	11	113.075	0.200	23.3	0.3396	0.0000	OK
15 minute summer	9	11	113.059	0.798	115.6	1.0927	0.0000	SURCHARGED
15 minute summer	10	11	111.841	0.256	18.9	0.4071	0.0000	SURCHARGED
15 minute summer	11	11	111.826	0.768	143.2	1.1931	0.0000	SURCHARGED
60 minute summer	12	37	108.970	0.138	5.6	0.1610	0.0000	OK
15 minute summer	13	10	110.210	0.085	26.7	0.1512	0.0000	OK
60 minute summer	14	38	108.966	0.257	33.3	0.3295	0.0000	OK
15 minute summer	15	10	109.031	0.116	36.9	0.2349	0.0000	OK
60 minute summer	16	37	108.951	1.109	76.2	1.6440	0.0000	SURCHARGED
30 minute summer	PP NE1	20	115.756	0.056	9.0	2.7239	0.0000	OK
60 minute summer	18	38	108.891	1.815	117.2	4.0449	0.0000	FLOOD RISK
60 minute summer	19	38	108.855	1.300	17.3	2.2179	0.0000	FLOOD RISK
60 minute summer	20	38	108.852	1.899	142.5	2.9496	0.0000	FLOOD RISK
60 minute summer	21	37	108.808	0.753	17.2	1.3517	0.0000	SURCHARGED
60 minute summer	22	38	108.803	1.940	168.8	2.3437	0.0000	SURCHARGED
60 minute summer	23	37	108.250	0.375	17.1	0.6953	0.0000	SURCHARGED
60 minute summer	24	37	108.245	1.476	113.6	1.9788	0.0000	SURCHARGED
60 minute summer	25	37	108.213	0.958	16.8	1.6168	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	2	7.5	1.557	0.067	0.0439	
15 minute summer	2	2	17	14.6	1.833	0.131	0.1066	
15 minute summer	3	3	5	23.1	2.146	0.207	0.1622	
15 minute summer	4	4	5	8.0	0.593	0.218	0.2343	
15 minute summer	5	5	7	43.5	1.972	0.390	0.3767	
15 minute summer	6	6	7	23.4	2.039	0.224	0.1443	
15 minute summer	7	7	9	77.9	2.406	0.699	0.9777	
15 minute summer	8	8	9	25.1	1.200	0.484	0.5252	
15 minute summer	9	9	11	101.8	2.561	0.914	1.0525	
15 minute summer	10	10	11	16.5	0.695	0.153	0.4897	
15 minute summer	11	11	41	143.6	3.611	1.289	0.2572	
60 minute summer	12	12	14	7.9	0.820	0.071	0.5699	
15 minute summer	13	13	14	26.7	2.058	0.263	0.1547	
60 minute summer	14	14	16	33.2	1.270	0.165	1.8090	
15 minute summer	15	15	16	36.9	1.905	0.451	0.2681	
60 minute summer	16	16	18	67.6	1.573	0.440	2.5612	
30 minute summer	PP NE1	PP NE1	5	4.6	1.030	0.583	0.0672	
60 minute summer	18	18	20	112.5	1.020	0.979	4.0324	
60 minute summer	19	19	20	13.6	0.771	0.371	0.5505	
60 minute summer	20	20	22	139.1	1.262	1.211	2.9724	
60 minute summer	21	21	22	17.4	1.422	0.237	0.4064	
60 minute summer	22	22	43	165.1	1.497	1.436	0.8072	
60 minute summer	23	23	24	16.9	0.877	0.463	0.5563	
60 minute summer	24	24	26	113.7	0.717	0.707	4.4011	
60 minute summer	25	25	26	15.2	1.007	0.222	0.7609	

Results for 100 year +20% CC Critical Storm Duration. Lowest mass balance: 99.69%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
720 minute summer	26	510	108.206	1.506	56.7	2.3308	0.0000	SURCHARGED
720 minute summer	27	525	108.080	1.025	4.5	1.8711	0.0000	SURCHARGED
720 minute summer	28	525	108.080	1.476	67.3	1.9221	0.0000	SURCHARGED
15 minute summer	29	10	108.099	0.184	37.4	0.3766	0.0000	OK
720 minute summer	30	525	108.079	1.553	77.5	2.3345	0.0000	SURCHARGED
720 minute summer	31	525	108.077	1.603	83.6	1.9368	0.0000	SURCHARGED
15 minute summer	17	10	116.594	0.058	14.6	0.0655	0.0000	OK
15 minute summer	33	1	115.113	0.000	0.0	0.0000	0.0000	OK
15 minute summer	34	10	112.875	0.078	28.1	0.1230	0.0000	OK
15 minute summer	35	10	111.521	0.083	28.1	0.0940	0.0000	OK
15 minute summer	36	10	109.953	0.080	29.7	0.0919	0.0000	OK
15 minute summer	37	10	110.440	0.040	4.4	0.0489	0.0000	OK
15 minute summer	38	10	109.619	0.114	53.6	0.1490	0.0000	OK
720 minute summer	39	525	108.078	1.641	95.6	2.0333	0.0000	SURCHARGED
2880 minute summer	out fall	2220	106.299	0.099	25.4	0.0000	0.0000	OK
1440 minute summer	41	990	111.212	1.149	19.9	1.3280	0.0000	SURCHARGED
1440 minute summer	Tree pits 3	1020	111.211	2.341	21.9	270.2704	0.0000	SURCHARGED
60 minute summer	43	38	108.772	1.933	168.2	2.3181	0.0000	SURCHARGED
60 minute summer	Tree pits 2	38	108.748	1.934	179.7	55.9883	0.0000	FLOOD RISK
60 minute summer	45	37	108.264	1.470	100.1	1.7802	0.0000	SURCHARGED
720 minute summer	46	510	108.205	1.571	61.6	1.9544	0.0000	FLOOD RISK
720 minute summer	Tree pits 1	510	108.204	1.586	62.7	32.6044	0.0000	FLOOD RISK
720 minute summer	Tree Pits 4	525	108.077	1.677	103.0	564.0081	0.0000	SURCHARGED
30 minute summer	PP NE2	22	112.416	0.216	30.4	9.0780	0.0000	FLOOD RISK
60 minute summer	PP NE3	42	108.831	0.331	23.9	15.0355	0.0000	FLOOD RISK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
720 minute summer	26	26	46	56.5	0.390	0.352	4.1808	
720 minute summer	27	27	28	4.1	0.738	0.064	0.5359	
720 minute summer	28	28	30	67.1	0.600	0.361	3.6884	
15 minute summer	29	29	30	37.4	1.140	0.909	0.5196	
720 minute summer	30	30	31	77.2	0.574	0.480	3.3099	
720 minute summer	31	31	39	83.3	0.638	0.448	1.7731	
15 minute summer	17	17	3	14.6	1.880	0.131	0.0873	
15 minute summer	33	33	34	0.0	0.000	0.000	0.0000	
15 minute summer	34	34	35	28.1	2.204	0.252	0.3814	
15 minute summer	35	35	36	28.1	2.227	0.252	0.1424	
15 minute summer	36	36	38	29.7	1.517	0.148	0.2247	
15 minute summer	37	37	38	4.4	0.952	0.065	0.0992	
15 minute summer	38	38	39	53.3	2.301	0.266	0.3915	
720 minute summer	39	39	Tree Pits 4	95.3	1.068	0.383	0.9844	
1440 minute summer	41	41	Tree pits 3	19.7	1.870	0.177	0.4081	
1440 minute summer	Tree pits 3	Hydro-Brake®	12	4.4				
60 minute summer	43	43	Tree pits 2	165.6	1.502	1.441	0.8372	
60 minute summer	Tree pits 2	Hydro-Brake®	45	97.5				
60 minute summer	45	45	24	99.4	0.627	0.618	1.6115	
720 minute summer	46	46	Tree pits 1	61.4	0.515	0.382	0.9896	
720 minute summer	Tree pits 1	Hydro-Brake®	28	62.6				
720 minute summer	Tree Pits 4	Basin 0	dba	33.5	0.559	0.474	0.1408	
30 minute summer	PP NE2	PP NE2	11	9.9	1.264	1.166	0.0988	
60 minute summer	PP NE3	PP NE3	18	8.8	1.130	1.324	0.1721	

Results for 100 year +20% CC Critical Storm Duration. Lowest mass balance: 99.69%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute summer	PP NE4	40	108.831	0.251	23.8	11.4118	0.0000	FLOOD RISK
720 minute summer	PP NE5	510	108.208	0.328	5.4	14.9468	0.0000	FLOOD RISK
30 minute summer	PP NE6	22	109.526	0.226	30.8	9.3047	0.0000	FLOOD RISK
30 minute summer	PP NE7	20	111.072	0.107	18.9	4.3224	0.0000	SURCHARGED
720 minute summer	dba	525	108.076	1.676	33.5	60.3226	0.0000	SURCHARGED
2160 minute summer	DB B	1500	107.362	1.062	26.1	39.3060	0.0000	FLOOD RISK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
60 minute summer	PP NE4	13.000	22	11.2	1.427	1.420	0.0493	
720 minute summer	PP NE5	PP NE5	46	5.4	1.093	0.659	0.0839	
30 minute summer	PP NE6	PP NE6	31	10.4	1.333	1.322	0.0608	
30 minute summer	PP NE7	PP NE7	38	10.6	1.449	1.030	0.0901	
720 minute summer	dba	Hydro-Brake®	DB B	26.1				
2160 minute summer	DB B	1.029	out fall	25.4	1.252	0.240	0.2233	2332.1

Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	5	Maximum Rainfall (mm/hr)	50.0
Additional Flow (%)	0	Minimum Velocity (m/s)	1.00
FSR Region	Scotland and Ireland	Connection Type	Level Soffits
M5-60 (mm)	18.400	Minimum Backdrop Height (m)	0.200
Ratio-R	0.216	Preferred Cover Depth (m)	1.200
CV	1.000	Include Intermediate Ground	✓
Time of Entry (mins)	4.00	Enforce best practice design rules	x

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
201	0.027	4.00	122.965	1200	712395.802	725807.323	1.425
202	0.054	4.00	121.620	1200	712431.597	725816.961	3.138
MH 134 NE catchment			114.990	1200	712102.590	725751.733	2.193
204	0.061	4.00	123.003	1200	712388.452	725805.630	1.425
205	0.020	4.00	122.463	1200	712336.185	725793.122	1.425
206	0.027	4.00	122.660	1200	712358.865	725797.368	1.737
DB SE1	0.072	4.00	119.000		712359.177	725809.905	3.825
208	0.008	4.00	122.270	1200	712330.573	725793.600	2.005
209	0.030	4.00	121.250	1200	712314.498	725797.533	1.737
210	0.008	4.00	121.350	1200	712299.993	725759.330	1.425
211	0.065	4.00	119.900	1200	712291.984	725793.678	1.425
DB SE2	0.044	4.00	117.000		712290.603	725800.210	4.325
213	0.009	4.00	121.050	1200	712243.568	725744.585	1.686
214	0.049	4.00	119.140	1200	712234.168	725779.626	1.605
215	0.015	4.00	119.760	1200	712280.891	725789.459	1.425
216	0.033	4.00	119.370	1200	712252.146	725781.528	1.745
218	0.012	4.00	118.960	1200	712222.967	725774.803	1.640
219	0.010	4.00	118.310	1200	712210.580	725770.976	1.425
220	0.043	4.00	118.260	1200	712160.614	725746.462	1.425
221	0.057	4.00	118.610	1200	712194.014	725756.175	1.949
DB SE4	0.196	4.00	113.000		712178.398	725774.601	2.650
PP SE 2	0.051	4.00	122.660		712357.788	725786.817	0.500
MH 133 NE catchment		4.00	117.303	1200	712136.577	725753.998	2.190
MH 135 NE catchment			113.030	1200	712072.756	725749.670	1.592
MH 136 NE catchment			112.350	1200	712064.009	725756.793	2.477
MH 137 NE catchment		4.00	111.825	1200	712040.411	725763.712	1.425
MH 138 NE catchment			111.465	1200	712061.527	725767.920	1.960
MH 139 NE catchment			110.460	1200	712060.429	725784.765	1.500
PP SE1	0.048	4.00	122.000		712410.846	725806.114	0.500
PP SE 3	0.088	4.00	121.350		712306.045	725754.025	0.500
PP SE 4	0.097	4.00	120.000		712249.562	725762.262	0.500
PP SE 5	0.094	4.00	118.610		712184.837	725743.780	0.500

Links

Name	US Node	DS Node	Length (m)	US IL (m)	DS IL (m)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1	201	202	37.070	121.540	120.195	225	4.25	50.0
2	202	DB SE1	72.763	118.482	115.175	225	4.82	50.0
1.004	DB SE4	MH 136 NE catchment	115.767	110.350	109.873	300	8.24	50.0
4	204	206	30.719	121.578	120.923	225	4.27	50.0
5	205	206	23.074	121.038	120.923	225	4.42	50.0
6	206	DB SE1	12.541	120.923	115.175	225	4.44	50.0
7	DB SE1	DB SE2	69.256	115.175	112.675	225	5.29	50.0
8	208	209	16.549	120.265	119.513	225	4.10	50.0
9	209	211	22.842	119.513	118.475	225	4.23	50.0
10	210	211	35.269	119.925	118.475	225	4.35	50.0
11	211	DB SE2	6.676	118.475	112.675	225	4.36	50.0
12	DB SE2	DB SE4	115.090	112.675	110.350	225	6.32	50.0
13	213	214	36.280	119.364	117.715	225	4.22	50.0
14	216	214	18.078	117.625	117.535	225	4.57	50.0
15	215	216	29.819	118.335	117.625	225	4.25	50.0
16	214	218	12.195	117.625	117.320	225	4.67	50.0
18	218	219	12.965	117.474	116.885	225	4.75	50.0
19	219	221	22.215	116.885	116.661	225	5.03	50.0
20	220	221	34.784	116.835	116.661	225	4.63	50.0
21	221	DB SE4	24.153	116.661	110.350	225	5.09	50.0
13.001	MH 134 NE catchment	MH 135 NE catchment	29.905	112.797	111.438	225	4.38	50.0
PP SE 2	PP SE 2	206	10.606	122.160	121.848	100	4.13	50.0
1.006	MH 133 NE catchment	MH 134 NE catchment	34.062	115.113	113.565	225	4.20	50.0

Name	Vel (m/s)	Cap (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)
1	2.501	99.5	1.200	1.200	0.027
2	2.801	111.4	2.913	3.600	0.130
1.004	1.005	71.0	2.350	2.177	1.221
4	1.915	76.1	1.200	1.512	0.061
5	0.921	36.6	1.200	1.512	0.020
6	8.924	354.8	1.512	3.600	0.159
7	2.495	99.2	3.600	4.100	0.361
8	2.801	111.4	1.780	1.512	0.008
9	2.801	111.4	1.512	1.200	0.038
10	2.664	105.9	1.200	1.200	0.096
11	12.291	488.7	1.200	4.100	0.200
12	1.863	74.1	4.100	2.425	0.605
13	2.801	111.4	1.461	1.200	0.009
14	0.921	36.6	1.520	1.380	0.048
15	2.024	80.5	1.200	1.520	0.015
16	2.074	82.5	1.290	1.415	0.203
18	2.801	111.4	1.261	1.200	0.216
19	1.313	52.2	1.200	1.724	0.226
20	0.921	36.6	1.200	1.724	0.043
21	6.735	267.8	1.724	2.425	0.420
13.001	2.801	111.4	1.968	1.367	0.000
PP SE 2	1.327	10.4	0.400	0.712	0.051
1.006	2.801	111.4	1.965	1.200	0.000

Links

Name	US Node	DS Node	Length (m)	US IL (m)	DS IL (m)	Dia (mm)	T of C (mins)	Rain (mm/hr)
2.000	PP SE1	202	23.415	121.500	121.107	100	4.39	50.0
1.007	MH 135 NE catchment	MH 136 NE catchment	11.280	111.438	110.925	225	4.45	50.0
1.008	MH 136 NE catchment	MH 138 NE catchment	11.400	109.873	109.505	300	8.30	50.0
1.009	MH 138 NE catchment	MH 139 NE catchment	16.881	109.505	108.960	300	8.40	50.0
10.000	MH 137 NE catchment	MH 138 NE catchment	21.531	110.400	110.292	225	4.39	50.0
6.000	PP SE 3	210	8.048	120.850	120.714	100	4.13	50.0
10.000_1	PP SE 4	214	23.205	119.500	118.445	100	4.23	50.0
12.000	PP SE 5	221	15.422	118.110	117.850	100	4.26	50.0

Name	Vel (m/s)	Cap (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)
2.000	0.999	7.8	0.400	0.413	0.048
1.007	2.801	111.4	1.367	1.200	0.000
1.008	2.834	200.3	2.177	1.660	1.221
1.009	2.834	200.3	1.660	1.200	1.221
10.000	0.921	36.6	1.200	0.948	0.000
6.000	1.003	7.9	0.400	0.536	0.088
10.000_1	1.653	13.0	0.400	0.595	0.097
12.000	1.002	7.9	0.400	0.660	0.094

Simulation Settings

Rainfall Methodology	FSR	Analysis Speed	Normal
Rainfall Events	Singular	Skip Steady State	x
FSR Region	Scotland and Ireland	Drain Down Time (mins)	240
M5-60 (mm)	18.400	Additional Storage (m³/ha)	20.0
Ratio-R	0.216	Starting Level (m)	
Summer CV	1.000	Check Discharge Rate(s)	x
Winter CV	1.000	Check Discharge Volume	x

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 %)
1	0	0	0
5	0	0	0
10	0	0	0
30	0	0	0
100	20	0	0

Node DB SE1 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	115.175	Product Number	CTL-SHE-0067-2000-1000-2000
Design Depth (m)	1.000	Min Outlet Diameter (m)	0.100
Design Flow (l/s)	2.0	Min Node Diameter (mm)	1200

Node DB SE2 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	112.675	Product Number	CTL-SHE-0169-1390-1000-1390
Design Depth (m)	1.000	Min Outlet Diameter (m)	0.225
Design Flow (l/s)	13.9	Min Node Diameter (mm)	1500

Node DB SE4 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	110.350	Product Number	CTL-SHE-0122-6800-1000-6800
Design Depth (m)	1.000	Min Outlet Diameter (m)	0.150
Design Flow (l/s)	6.8	Min Node Diameter (mm)	1200

Node DB SE1 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	115.175
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)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	370.0	0.0	1.000	370.0	0.0	1.001	0.0	0.0

Node DB SE2 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	112.675
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	84

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	75.0	0.0	1.000	75.0	0.0	1.001	0.0	0.0

Node DB SE4 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	110.350
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)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	915.0	0.0	1.000	915.0	0.0	1.001	0.0	0.0

Node PP SE1 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	121.500
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.30	Time to half empty (mins)	14

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	95.0	0.0	0.350	95.0	0.0	0.351	0.0	0.0

Node PP SE 2 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	122.160
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.30	Time to half empty (mins)	10

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	120.0	0.0	0.350	120.0	0.0	0.351	0.0	0.0

Node PP SE 3 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	120.850
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.30	Time to half empty (mins)	32

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	182.0	0.0	0.350	182.0	0.0	0.351	0.0	0.0

Node PP SE 4 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	119.500
Side Inf Coefficient (m/hr)	0.00000	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	216.0	0.0	0.350	216.0	0.0	0.351	0.0	0.0

Node PP SE 5 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	118.110
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.30	Time to half empty (mins)	37

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	185.0	0.0	0.350	185.0	0.0	0.351	0.0	0.0

Other (defaults)

Entry Loss (manhole)	0.250	Entry Loss (junction)	0.000	Apply Recommended Losses	x
Exit Loss (manhole)	0.250	Exit Loss (junction)	0.000	Flood Risk (m)	0.300

Approval Settings

Node Size	✓	Minimum Full Bore Velocity (m/s)	
Node Losses	✓	Maximum Full Bore Velocity (m/s)	3.000
Link Size	✓	Proportional Velocity	✓
Minimum Diameter (mm)	150	Return Period (years)	
Link Length	✓	Minimum Proportional Velocity (m/s)	0.750
Maximum Length (m)	100.000	Maximum Proportional Velocity (m/s)	3.000
Coordinates	✓	Surcharged Depth	✓
Accuracy (m)	1.000	Return Period (years)	
Crossings	✓	Maximum Surcharged Depth (m)	0.100
Cover Depth	✓	Flooding	✓
Minimum Cover Depth (m)		Return Period (years)	30
Maximum Cover Depth (m)	3.000	Time to Half Empty	x
Backdrops	✓	Discharge Rates	✓
Minimum Backdrop Height (m)		Discharge Volume	✓
Maximum Backdrop Height (m)	1.500	100 year 360 minute (m ³)	
Full Bore Velocity	✓		

Results for 1 year Critical Storm Duration. Lowest mass balance: 99.75%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	201	10	121.573	0.033	4.5	0.0495	0.0000	OK
15 minute summer	202	10	118.549	0.067	16.7	0.0992	0.0000	OK
15 minute summer	MH 134 NE catchment	1	112.797	0.000	0.0	0.0000	0.0000	OK
15 minute summer	204	10	121.638	0.060	10.2	0.1187	0.0000	OK
15 minute summer	205	10	121.085	0.047	3.4	0.0671	0.0000	OK
15 minute summer	206	10	120.964	0.041	21.3	0.0590	0.0000	OK
2160 minute summer	DB SE1	1380	115.450	0.275	6.3	101.9210	0.0000	SURCHARGED
15 minute summer	208	10	120.283	0.018	1.4	0.0216	0.0000	OK
15 minute summer	209	10	119.552	0.039	6.4	0.0577	0.0000	OK
60 minute summer	210	37	119.970	0.045	7.6	0.0561	0.0000	OK
15 minute summer	211	9	118.503	0.028	21.8	0.0580	0.0000	OK
120 minute summer	DB SE2	74	112.868	0.193	20.8	14.5387	0.0000	OK
15 minute summer	213	10	119.383	0.019	1.6	0.0234	0.0000	OK
30 minute summer	214	18	117.707	0.172	23.5	0.2984	0.0000	OK
15 minute summer	215	10	118.362	0.027	2.5	0.0365	0.0000	OK
30 minute summer	216	18	117.710	0.085	7.6	0.1281	0.0000	OK
30 minute summer	218	18	117.546	0.226	25.2	0.2903	0.0000	OK
30 minute summer	219	18	117.008	0.123	26.7	0.1565	0.0000	OK
15 minute summer	220	10	116.902	0.067	7.1	0.1164	0.0000	OK
15 minute summer	221	10	116.736	0.075	45.2	0.1295	0.0000	OK
2160 minute summer	DB SE4	1380	110.635	0.284	16.7	260.6931	0.0000	OK
30 minute summer	PP SE 2	20	122.212	0.052	8.0	1.9638	0.0000	OK
15 minute summer	MH 133 NE catchment	1	115.113	0.000	0.0	0.0000	0.0000	OK
15 minute summer	MH 135 NE catchment	1	111.438	0.000	0.0	0.0000	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	201	1	202	4.5	1.265	0.045	0.1309	
15 minute summer	202	2	DB SE1	16.5	2.940	0.149	0.4638	
15 minute summer	MH 134 NE catchment	13.001	MH 135 NE catchment	0.0	0.000	0.000	0.0000	
15 minute summer	204	4	206	10.2	1.544	0.134	0.2046	
15 minute summer	205	5	206	3.4	0.618	0.093	0.1268	
15 minute summer	206	6	DB SE1	21.4	6.531	0.060	0.0527	
2160 minute summer	DB SE1	Hydro-Brake®	DB SE2	2.0				
15 minute summer	208	8	209	1.4	0.483	0.013	0.0500	
15 minute summer	209	9	211	6.4	1.748	0.057	0.0840	
60 minute summer	210	10	211	7.6	2.003	0.072	0.1408	
15 minute summer	211	11	DB SE2	21.9	5.014	0.045	0.0777	
120 minute summer	DB SE2	Hydro-Brake®	DB SE4	13.3				
15 minute summer	213	13	214	1.6	1.001	0.014	0.0570	
30 minute summer	214	16	218	23.4	0.809	0.284	0.3216	
15 minute summer	215	15	216	2.5	0.342	0.031	0.2389	
30 minute summer	216	14	214	7.2	0.309	0.196	0.4180	
30 minute summer	218	18	219	25.2	1.520	0.226	0.2159	
30 minute summer	219	19	221	26.5	1.594	0.507	0.3749	
15 minute summer	220	20	221	7.1	0.664	0.195	0.3746	
15 minute summer	221	21	DB SE4	45.6	7.920	0.170	0.1588	
2160 minute summer	DB SE4	Hydro-Brake®	MH 136 NE catchment	6.8				
30 minute summer	PP SE 2	PP SE 2	206	5.3	1.312	0.505	0.0426	
15 minute summer	MH 133 NE catchment	1.006	MH 134 NE catchment	0.0	0.000	0.000	0.0000	
15 minute summer	MH 135 NE catchment	1.007	MH 136 NE catchment	0.0	0.000	0.000	0.0000	

Results for 1 year Critical Storm Duration. Lowest mass balance: 99.75%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
2160 minute summer	MH 136 NE catchment	1380	109.912	0.039	6.8	0.0438	0.0000	OK
15 minute summer	MH 137 NE catchment	1	110.400	0.000	0.0	0.0000	0.0000	OK
2160 minute summer	MH 138 NE catchment	1380	109.544	0.038	6.8	0.0435	0.0000	OK
2160 minute summer	MH 139 NE catchment	1380	108.998	0.038	6.8	0.0000	0.0000	OK
30 minute summer	PP SE1	20	121.559	0.059	7.6	1.7935	0.0000	OK
60 minute summer	PP SE 3	36	120.927	0.076	11.1	4.4455	0.0000	OK
30 minute summer	PP SE 4	20	119.562	0.062	15.4	4.2406	0.0000	OK
60 minute summer	PP SE 5	36	118.189	0.079	11.8	4.6778	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)
2160 minute summer	MH 136 NE catchment	1.008	MH 138 NE catchment	6.8	1.283	0.034	0.0602	
15 minute summer	MH 137 NE catchment	10.000	MH 138 NE catchment	0.0	0.000	0.000	0.0000	
2160 minute summer	MH 138 NE catchment	1.009	MH 139 NE catchment	6.8	1.310	0.034	0.0872	620.2
30 minute summer	PP SE1	2.000	202	5.0	1.056	0.641	0.1115	
60 minute summer	PP SE 3	6.000	210	6.9	1.105	0.879	0.0504	
30 minute summer	PP SE 4	10.000_1	214	8.9	1.761	0.682	0.1166	
60 minute summer	PP SE 5	12.000	221	7.3	1.123	0.931	0.1006	

Results for 5 year Critical Storm Duration. Lowest mass balance: 99.75%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	201	10	121.580	0.040	6.8	0.0608	0.0000	OK
15 minute summer	202	10	118.565	0.083	26.1	0.1223	0.0000	OK
15 minute summer	MH 134 NE catchment	1	112.797	0.000	0.0	0.0000	0.0000	OK
15 minute summer	204	10	121.652	0.074	15.4	0.1477	0.0000	OK
15 minute summer	205	10	121.096	0.058	5.1	0.0825	0.0000	OK
15 minute summer	206	10	120.972	0.049	33.2	0.0710	0.0000	OK
2160 minute summer	DB SE1	1500	115.585	0.410	8.2	151.6986	0.0000	SURCHARGED
15 minute summer	208	10	120.287	0.021	2.1	0.0261	0.0000	OK
15 minute summer	209	10	119.561	0.048	9.6	0.0707	0.0000	OK
30 minute summer	210	18	119.975	0.050	9.8	0.0616	0.0000	OK
15 minute summer	211	10	118.509	0.034	34.1	0.0694	0.0000	OK
120 minute summer	DB SE2	80	112.990	0.315	29.8	23.7010	0.0000	SURCHARGED
15 minute summer	213	10	119.387	0.023	2.4	0.0284	0.0000	OK
30 minute summer	214	18	117.728	0.193	35.8	0.3355	0.0000	OK
15 minute summer	215	10	118.369	0.034	3.9	0.0452	0.0000	OK
15 minute summer	216	10	117.735	0.110	12.1	0.1660	0.0000	OK
30 minute summer	218	18	117.565	0.245	38.6	0.3139	0.0000	OK
30 minute summer	219	18	117.048	0.163	40.7	0.2071	0.0000	OK
15 minute summer	220	10	116.919	0.084	10.8	0.1460	0.0000	OK
15 minute summer	221	10	116.756	0.095	71.3	0.1627	0.0000	OK
2880 minute summer	DB SE4	1920	110.762	0.412	19.1	377.1985	0.0000	SURCHARGED
30 minute summer	PP SE 2	19	122.230	0.070	12.0	2.6595	0.0000	OK
15 minute summer	MH 133 NE catchment	1	115.113	0.000	0.0	0.0000	0.0000	OK
15 minute summer	MH 135 NE catchment	1	111.438	0.000	0.0	0.0000	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	201	1	202	6.8	1.429	0.068	0.1758	
15 minute summer	202	2	DB SE1	26.0	3.168	0.234	0.6828	
15 minute summer	MH 134 NE catchment	13.001	MH 135 NE catchment	0.0	0.000	0.000	0.0000	
15 minute summer	204	4	206	15.4	1.743	0.202	0.2735	
15 minute summer	205	5	206	5.1	0.701	0.139	0.1679	
15 minute summer	206	6	DB SE1	33.4	6.913	0.094	0.0925	
2160 minute summer	DB SE1	Hydro-Brake®	DB SE2	2.0				
15 minute summer	208	8	209	2.1	0.543	0.019	0.0669	
15 minute summer	209	9	211	9.6	1.958	0.086	0.1131	
30 minute summer	210	10	211	9.7	2.161	0.092	0.1786	
15 minute summer	211	11	DB SE2	34.0	5.377	0.070	0.1196	
120 minute summer	DB SE2	Hydro-Brake®	DB SE4	13.9				
15 minute summer	213	13	214	2.4	1.132	0.021	0.0760	
30 minute summer	214	16	218	35.8	1.086	0.434	0.3504	
15 minute summer	215	15	216	3.9	0.372	0.048	0.3433	
15 minute summer	216	14	214	11.6	0.408	0.316	0.5007	
30 minute summer	218	18	219	38.5	1.669	0.346	0.2972	
30 minute summer	219	19	221	40.5	1.790	0.776	0.5076	
15 minute summer	220	20	221	10.9	0.741	0.297	0.5103	
15 minute summer	221	21	DB SE4	70.9	8.545	0.265	0.2258	
2880 minute summer	DB SE4	Hydro-Brake®	MH 136 NE catchment	6.8				
30 minute summer	PP SE 2	PP SE 2	206	8.2	1.442	0.791	0.0607	
15 minute summer	MH 133 NE catchment	1.006	MH 134 NE catchment	0.0	0.000	0.000	0.0000	
15 minute summer	MH 135 NE catchment	1.007	MH 136 NE catchment	0.0	0.000	0.000	0.0000	

Results for 5 year Critical Storm Duration. Lowest mass balance: 99.75%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
7200 minute summer	MH 136 NE catchment	3840	109.912	0.039	6.8	0.0438	0.0000	OK
15 minute summer	MH 137 NE catchment	1	110.400	0.000	0.0	0.0000	0.0000	OK
600 minute summer	MH 138 NE catchment	375	109.544	0.039	6.8	0.0435	0.0000	OK
600 minute summer	MH 139 NE catchment	375	108.998	0.038	6.8	0.0000	0.0000	OK
30 minute summer	PP SE1	19	121.581	0.081	11.5	2.4603	0.0000	OK
60 minute summer	PP SE 3	38	120.963	0.113	16.3	6.5901	0.0000	SURCHARGED
30 minute summer	PP SE 4	20	119.586	0.086	23.1	5.8951	0.0000	OK
60 minute summer	PP SE 5	38	118.231	0.120	17.4	7.1394	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)
7200 minute summer	MH 136 NE catchment	1.008	MH 138 NE catchment	6.8	1.283	0.034	0.0602	
15 minute summer	MH 137 NE catchment	10.000	MH 138 NE catchment	0.0	0.000	0.000	0.0000	
600 minute summer	MH 138 NE catchment	1.009	MH 139 NE catchment	6.8	1.310	0.034	0.0873	245.6
30 minute summer	PP SE1	2.000	202	7.7	1.127	0.977	0.1647	
60 minute summer	PP SE 3	6.000	210	8.1	1.114	1.034	0.0613	
30 minute summer	PP SE 4	10.000_1	214	13.4	1.846	1.034	0.1736	
60 minute summer	PP SE 5	12.000	221	8.2	1.123	1.042	0.1175	

Results for 10 year Critical Storm Duration. Lowest mass balance: 99.75%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	201	10	121.583	0.043	7.9	0.0654	0.0000	OK
15 minute summer	202	10	118.571	0.089	30.4	0.1316	0.0000	OK
15 minute summer	MH 134 NE catchment	1	112.797	0.000	0.0	0.0000	0.0000	OK
15 minute summer	204	10	121.658	0.080	17.8	0.1598	0.0000	OK
15 minute summer	205	10	121.101	0.063	5.9	0.0889	0.0000	OK
15 minute summer	206	10	120.976	0.053	38.7	0.0757	0.0000	OK
2880 minute summer	DB SE1	1920	115.641	0.466	7.9	172.4978	0.0000	SURCHARGED
15 minute summer	208	10	120.288	0.023	2.4	0.0278	0.0000	OK
15 minute summer	209	10	119.565	0.052	11.1	0.0762	0.0000	OK
60 minute summer	210	36	119.975	0.050	9.8	0.0626	0.0000	OK
15 minute summer	211	10	118.511	0.036	39.5	0.0745	0.0000	OK
120 minute summer	DB SE2	84	113.057	0.382	33.5	28.7335	0.0000	SURCHARGED
15 minute summer	213	10	119.388	0.024	2.7	0.0302	0.0000	OK
30 minute summer	214	18	117.739	0.204	40.9	0.3552	0.0000	OK
15 minute summer	215	10	118.371	0.036	4.5	0.0485	0.0000	OK
30 minute summer	216	18	117.749	0.123	13.1	0.1858	0.0000	OK
30 minute summer	218	18	117.572	0.252	44.2	0.3235	0.0000	OK
30 minute summer	219	18	117.068	0.183	46.8	0.2317	0.0000	OK
15 minute summer	220	10	116.926	0.091	12.5	0.1586	0.0000	OK
15 minute summer	221	10	116.763	0.102	82.8	0.1757	0.0000	OK
2880 minute summer	DB SE4	1920	110.824	0.474	20.9	434.4683	0.0000	SURCHARGED
30 minute summer	PP SE 2	19	122.239	0.079	14.0	3.0099	0.0000	OK
15 minute summer	MH 133 NE catchment	1	115.113	0.000	0.0	0.0000	0.0000	OK
15 minute summer	MH 135 NE catchment	1	111.438	0.000	0.0	0.0000	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	201	1	202	7.9	1.493	0.079	0.1955	
15 minute summer	202	2	DB SE1	30.4	3.236	0.273	0.7801	
15 minute summer	MH 134 NE catchment	13.001	MH 135 NE catchment	0.0	0.000	0.000	0.0000	
15 minute summer	204	4	206	17.8	1.820	0.233	0.3028	
15 minute summer	205	5	206	5.9	0.735	0.161	0.1854	
15 minute summer	206	6	DB SE1	38.9	7.042	0.110	0.1120	
2880 minute summer	DB SE1	Hydro-Brake®	DB SE2	2.0				
15 minute summer	208	8	209	2.4	0.559	0.022	0.0741	
15 minute summer	209	9	211	11.1	2.039	0.100	0.1256	
60 minute summer	210	10	211	9.8	2.168	0.092	0.1773	
15 minute summer	211	11	DB SE2	39.4	5.574	0.081	0.1340	
120 minute summer	DB SE2	Hydro-Brake®	DB SE4	13.9				
15 minute summer	213	13	214	2.7	1.175	0.024	0.0827	
30 minute summer	214	16	218	41.0	1.196	0.497	0.3658	
15 minute summer	215	15	216	4.5	0.379	0.056	0.3892	
30 minute summer	216	14	214	12.3	0.411	0.337	0.5441	
30 minute summer	218	18	219	44.2	1.704	0.397	0.3318	
30 minute summer	219	19	221	46.7	1.843	0.895	0.5618	
15 minute summer	220	20	221	12.6	0.771	0.343	0.5672	
15 minute summer	221	21	DB SE4	82.4	8.777	0.308	0.2524	
2880 minute summer	DB SE4	Hydro-Brake®	MH 136 NE catchment	6.8				
30 minute summer	PP SE 2	PP SE 2	206	9.5	1.470	0.914	0.0688	
15 minute summer	MH 133 NE catchment	1.006	MH 134 NE catchment	0.0	0.000	0.000	0.0000	
15 minute summer	MH 135 NE catchment	1.007	MH 136 NE catchment	0.0	0.000	0.000	0.0000	

Results for 10 year Critical Storm Duration. Lowest mass balance: 99.75%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
360 minute summer	MH 136 NE catchment	528	109.912	0.039	6.8	0.0438	0.0000	OK
15 minute summer	MH 137 NE catchment	1	110.400	0.000	0.0	0.0000	0.0000	OK
360 minute summer	MH 138 NE catchment	528	109.544	0.039	6.8	0.0435	0.0000	OK
360 minute summer	MH 139 NE catchment	528	108.998	0.038	6.8	0.0000	0.0000	OK
30 minute summer	PP SE1	20	121.593	0.093	13.3	2.8423	0.0000	OK
60 minute summer	PP SE 3	38	120.986	0.136	18.9	7.9311	0.0000	SURCHARGED
30 minute summer	PP SE 4	21	119.601	0.101	26.7	6.9582	0.0000	SURCHARGED
60 minute summer	PP SE 5	39	118.256	0.146	20.2	8.6538	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)
360 minute summer	MH 136 NE catchment	1.008	MH 138 NE catchment	6.8	1.283	0.034	0.0602	
15 minute summer	MH 137 NE catchment	10.000	MH 138 NE catchment	0.0	0.000	0.000	0.0000	
360 minute summer	MH 138 NE catchment	1.009	MH 139 NE catchment	6.8	1.310	0.034	0.0873	184.4
30 minute summer	PP SE1	2.000	202	8.3	1.128	1.052	0.1760	
60 minute summer	PP SE 3	6.000	210	8.6	1.114	1.091	0.0616	
30 minute summer	PP SE 4	10.000_1	214	13.7	1.843	1.053	0.1816	
60 minute summer	PP SE 5	12.000	221	8.5	1.125	1.076	0.1179	

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.75%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	201	10	121.589	0.049	10.0	0.0737	0.0000	OK
15 minute summer	202	10	118.582	0.100	38.1	0.1470	0.0000	OK
15 minute summer	MH 134 NE catchment	1	112.797	0.000	0.0	0.0000	0.0000	OK
15 minute summer	204	10	121.670	0.092	22.6	0.1827	0.0000	OK
15 minute summer	205	10	121.109	0.071	7.5	0.1008	0.0000	OK
15 minute summer	206	9	120.982	0.059	49.3	0.0844	0.0000	OK
2880 minute summer	DB SE1	2040	115.776	0.601	9.2	222.5876	0.0000	SURCHARGED
15 minute summer	208	10	120.291	0.026	3.1	0.0314	0.0000	OK
15 minute summer	209	10	119.571	0.058	14.1	0.0862	0.0000	OK
60 minute summer	210	38	119.978	0.053	10.9	0.0660	0.0000	OK
15 minute summer	211	10	118.516	0.041	49.2	0.0831	0.0000	OK
180 minute summer	DB SE2	124	113.208	0.533	33.8	40.0496	0.0000	SURCHARGED
15 minute summer	213	10	119.391	0.027	3.5	0.0340	0.0000	OK
15 minute summer	214	10	117.768	0.233	50.9	0.4045	0.0000	OK
15 minute summer	215	10	118.375	0.040	5.7	0.0544	0.0000	OK
15 minute summer	216	10	117.784	0.159	17.7	0.2391	0.0000	OK
15 minute summer	218	11	117.588	0.268	54.0	0.3436	0.0000	OK
15 minute summer	219	11	117.168	0.282	57.3	0.3585	0.0000	SURCHARGED
15 minute summer	220	10	116.941	0.106	15.9	0.1832	0.0000	OK
15 minute summer	221	10	116.773	0.112	98.7	0.1926	0.0000	OK
2160 minute summer	DB SE4	1560	110.941	0.591	27.8	541.3398	0.0000	SURCHARGED
30 minute summer	PP SE 2	20	122.262	0.102	17.8	3.8718	0.0000	SURCHARGED
15 minute summer	MH 133 NE catchment	1	115.113	0.000	0.0	0.0000	0.0000	OK
15 minute summer	MH 135 NE catchment	1	111.438	0.000	0.0	0.0000	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	201	1	202	10.0	1.600	0.100	0.2313	
15 minute summer	202	2	DB SE1	38.5	3.338	0.346	0.9914	
15 minute summer	MH 134 NE catchment	13.001	MH 135 NE catchment	0.0	0.000	0.000	0.0000	
15 minute summer	204	4	206	22.6	1.953	0.296	0.3580	
15 minute summer	205	5	206	7.5	0.796	0.205	0.2178	
15 minute summer	206	6	DB SE1	49.6	7.274	0.140	0.1504	
2880 minute summer	DB SE1	Hydro-Brake®	DB SE2	2.0				
15 minute summer	208	8	209	3.1	0.605	0.028	0.0884	
15 minute summer	209	9	211	14.1	2.187	0.127	0.1487	
60 minute summer	210	10	211	10.8	2.223	0.102	0.1933	
15 minute summer	211	11	DB SE2	49.2	5.739	0.101	0.1445	
180 minute summer	DB SE2	Hydro-Brake®	DB SE4	13.9				
15 minute summer	213	13	214	3.5	1.121	0.031	0.1773	
15 minute summer	214	16	218	49.4	1.350	0.599	0.4042	
15 minute summer	215	15	216	5.7	0.392	0.071	0.5188	
15 minute summer	216	14	214	16.8	0.463	0.459	0.6304	
15 minute summer	218	18	219	53.7	1.723	0.482	0.3887	
15 minute summer	219	19	221	56.0	1.819	1.073	0.6606	
15 minute summer	220	20	221	15.9	0.838	0.435	0.6608	
15 minute summer	221	21	DB SE4	99.6	9.079	0.372	0.2988	
2160 minute summer	DB SE4	Hydro-Brake®	MH 136 NE catchment	6.8				
30 minute summer	PP SE 2	PP SE 2	206	10.7	1.466	1.026	0.0826	
15 minute summer	MH 133 NE catchment	1.006	MH 134 NE catchment	0.0	0.000	0.000	0.0000	
15 minute summer	MH 135 NE catchment	1.007	MH 136 NE catchment	0.0	0.000	0.000	0.0000	

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.75%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
5760 minute winter	MH 136 NE catchment	2940	109.912	0.039	6.8	0.0438	0.0000	OK
15 minute summer	MH 137 NE catchment	1	110.400	0.000	0.0	0.0000	0.0000	OK
5760 minute winter	MH 138 NE catchment	2940	109.544	0.039	6.8	0.0435	0.0000	OK
5760 minute winter	MH 139 NE catchment	2940	108.998	0.038	6.8	0.0000	0.0000	OK
30 minute summer	PP SE1	20	121.629	0.129	17.0	3.9297	0.0000	SURCHARGED
60 minute summer	PP SE 3	39	121.033	0.183	24.0	10.6558	0.0000	SURCHARGED
30 minute summer	PP SE 4	21	119.641	0.141	34.1	9.6883	0.0000	SURCHARGED
60 minute summer	PP SE 5	40	118.309	0.199	25.6	11.8095	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)
5760 minute winter	MH 136 NE catchment	1.008	MH 138 NE catchment	6.8	1.283	0.034	0.0602	
15 minute summer	MH 137 NE catchment	10.000	MH 138 NE catchment	0.0	0.000	0.000	0.0000	
5760 minute winter	MH 138 NE catchment	1.009	MH 139 NE catchment	6.8	1.310	0.034	0.0873	1739.3
30 minute summer	PP SE1	2.000	202	8.3	1.138	1.052	0.1784	
60 minute summer	PP SE 3	6.000	210	9.5	1.218	1.210	0.0621	
30 minute summer	PP SE 4	10.000_1	214	13.7	1.848	1.053	0.1816	
60 minute summer	PP SE 5	12.000	221	9.0	1.151	1.145	0.1186	

Results for 100 year +20% CC Critical Storm Duration. Lowest mass balance: 99.75%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	201	10	121.601	0.061	15.6	0.0926	0.0000	OK
15 minute summer	202	9	118.603	0.121	55.0	0.1790	0.0000	OK
15 minute summer	MH 134 NE catchment	1	112.797	0.000	0.0	0.0000	0.0000	OK
15 minute summer	204	10	121.698	0.120	35.2	0.2392	0.0000	OK
15 minute summer	205	10	121.128	0.090	11.7	0.1279	0.0000	OK
15 minute summer	206	9	120.994	0.071	72.5	0.1025	0.0000	OK
2880 minute summer	DB SE1	2160	116.143	0.968	13.2	358.4106	0.0000	SURCHARGED
15 minute summer	208	10	120.297	0.032	4.8	0.0386	0.0000	OK
15 minute summer	209	10	119.587	0.074	22.0	0.1097	0.0000	OK
60 minute summer	210	38	119.985	0.060	13.9	0.0743	0.0000	OK
15 minute summer	211	10	118.524	0.049	73.2	0.1009	0.0000	OK
180 minute summer	DB SE2	144	113.668	0.993	48.0	74.6614	0.0000	SURCHARGED
15 minute summer	213	10	119.398	0.034	5.4	0.0418	0.0000	OK
15 minute summer	214	11	117.949	0.414	68.8	0.7205	0.0000	SURCHARGED
15 minute summer	215	10	118.385	0.050	8.8	0.0674	0.0000	OK
15 minute summer	216	11	117.990	0.365	27.5	0.5491	0.0000	SURCHARGED
15 minute summer	218	11	117.708	0.388	69.4	0.4971	0.0000	SURCHARGED
15 minute summer	219	11	117.409	0.524	73.9	0.6654	0.0000	SURCHARGED
15 minute summer	220	10	116.975	0.140	24.7	0.2435	0.0000	OK
15 minute summer	221	10	116.793	0.132	136.7	0.2264	0.0000	OK
2880 minute summer	DB SE4	2160	111.315	0.965	33.3	884.1397	0.0000	SURCHARGED
30 minute summer	PP SE 2	21	122.348	0.188	27.9	7.1601	0.0000	SURCHARGED
15 minute summer	MH 133 NE catchment	1	115.113	0.000	0.0	0.0000	0.0000	OK
15 minute summer	MH 135 NE catchment	1	111.438	0.000	0.0	0.0000	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	201	1	202	15.6	1.814	0.157	0.3186	
15 minute summer	202	2	DB SE1	56.0	3.480	0.502	1.5127	
15 minute summer	MH 134 NE catchment	13.001	MH 135 NE catchment	0.0	0.000	0.000	0.0000	
15 minute summer	204	4	206	35.1	2.240	0.461	0.4871	
15 minute summer	205	5	206	11.7	0.942	0.319	0.2920	
15 minute summer	206	6	DB SE1	73.1	7.554	0.206	0.2396	
2880 minute summer	DB SE1	Hydro-Brake®	DB SE2	2.0				
15 minute summer	208	8	209	4.8	0.674	0.043	0.1226	
15 minute summer	209	9	211	22.0	2.492	0.198	0.2035	
60 minute summer	210	10	211	13.8	2.365	0.130	0.2367	
15 minute summer	211	11	DB SE2	73.1	6.293	0.150	0.1541	
180 minute summer	DB SE2	Hydro-Brake®	DB SE4	13.9				
15 minute summer	213	13	214	5.4	1.099	0.048	0.7817	
15 minute summer	214	16	218	62.3	1.567	0.756	0.4850	
15 minute summer	215	15	216	8.8	0.409	0.109	0.6907	
15 minute summer	216	14	214	22.8	0.572	0.622	0.7190	
15 minute summer	218	18	219	68.2	1.753	0.612	0.5156	
15 minute summer	219	19	221	72.2	2.102	1.384	0.7095	
15 minute summer	220	20	221	24.8	0.987	0.676	0.8721	
15 minute summer	221	21	DB SE4	136.9	9.282	0.511	0.4143	
2880 minute summer	DB SE4	Hydro-Brake®	MH 136 NE catchment	6.8				
30 minute summer	PP SE 2	PP SE 2	206	11.3	1.459	1.081	0.0830	
15 minute summer	MH 133 NE catchment	1.006	MH 134 NE catchment	0.0	0.000	0.000	0.0000	
15 minute summer	MH 135 NE catchment	1.007	MH 136 NE catchment	0.0	0.000	0.000	0.0000	

Results for 100 year +20% CC Critical Storm Duration. Lowest mass balance: 99.75%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute summer	MH 136 NE catchment	73	109.912	0.039	6.8	0.0438	0.0000	OK
15 minute summer	MH 137 NE catchment	1	110.400	0.000	0.0	0.0000	0.0000	OK
60 minute summer	MH 138 NE catchment	73	109.544	0.039	6.8	0.0435	0.0000	OK
60 minute summer	MH 139 NE catchment	73	108.998	0.038	6.8	0.0000	0.0000	OK
30 minute summer	PP SE1	22	121.741	0.241	26.6	7.3311	0.0000	FLOOD RISK
60 minute summer	PP SE 3	40	121.166	0.316	37.3	18.3598	0.0000	FLOOD RISK
60 minute summer	PP SE 4	40	119.763	0.263	41.1	18.0551	0.0000	FLOOD RISK
60 minute summer	PP SE 5	41	118.462	0.351	39.7	20.7753	0.0000	FLOOD RISK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
60 minute summer	MH 136 NE catchment	1.008	MH 138 NE catchment	6.8	1.283	0.034	0.0602	
15 minute summer	MH 137 NE catchment	10.000	MH 138 NE catchment	0.0	0.000	0.000	0.0000	
60 minute summer	MH 138 NE catchment	1.009	MH 139 NE catchment	6.8	1.310	0.034	0.0873	110.0
30 minute summer	PP SE1	2.000	202	9.0	1.147	1.143	0.1801	
60 minute summer	PP SE 3	6.000	210	12.0	1.533	1.522	0.0623	
60 minute summer	PP SE 4	10.000_1	214	13.7	1.844	1.052	0.1816	
60 minute summer	PP SE 5	12.000	221	10.7	1.364	1.356	0.1194	

Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	5	Maximum Rainfall (mm/hr)	50.0
Additional Flow (%)	0	Minimum Velocity (m/s)	1.00
FSR Region	Scotland and Ireland	Connection Type	Level Soffits
M5-60 (mm)	18.400	Minimum Backdrop Height (m)	0.200
Ratio-R	0.216	Preferred Cover Depth (m)	1.200
CV	1.000	Include Intermediate Ground	✓
Time of Entry (mins)	4.00	Enforce best practice design rules	x

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
PP SE 6	0.048	4.00	117.580		712132.013	725727.118	0.500
PP SE 7	0.078	4.00	116.068		712045.838	725708.755	0.500
323	0.019	4.00	118.140	1200	712151.460	725744.189	1.425
324	0.038	4.00	117.256	1200	712108.245	725734.334	1.425
325	0.053	4.00	117.580	1200	712115.684	725734.695	1.590
DB SE5	0.035	4.00	117.810	1200	712112.933	725745.676	2.635
327	0.025	4.00	117.070	1200	712091.386	725728.437	1.425
328	0.010	4.00	115.815	1200	712031.985	725718.105	1.425
329	0.025	4.00	116.068	1200	712043.185	725715.359	1.736
430	0.064	4.00	116.270	1200	712052.923	725718.126	2.064
DB SE6	0.060	4.00	115.000	1200	712049.336	725726.769	2.700
OUTFALL INTO RIVER			112.500	1200	712021.142	725752.698	1.500

Links

Name	US Node	DS Node	Length (m)	US IL (m)	DS IL (m)	Dia (mm)	T of C (mins)	Rain (mm/hr)
PP SE 6	PP SE 6	325	18.001	117.080	116.827	100	4.33	50.0
PP SE 7	PP SE 7	329	7.117	115.568	115.448	100	4.12	50.0
23	323	325	37.014	116.715	115.990	225	4.34	50.0
24	324	327	17.861	115.831	115.742	225	4.32	50.0
25	325	DB SE5	11.320	115.990	115.475	225	4.40	50.0
26	DB SE5	DB SE6	66.348	115.175	112.300	225	4.81	50.0
27	327	430	39.821	115.645	114.845	225	4.68	50.0
28	328	329	11.532	114.390	114.332	225	4.21	50.0

Name	Vel (m/s)	Cap (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)
PP SE 6	0.914	7.2	0.400	0.653	0.048
PP SE 7	1.002	7.9	0.400	0.520	0.078
23	1.834	72.9	1.200	1.365	0.019
24	0.921	36.6	1.200	1.103	0.038
25	2.803	111.4	1.365	2.110	0.120
26	2.735	108.7	2.410	2.475	0.155
27	1.858	73.9	1.200	1.200	0.063
28	0.921	36.6	1.200	1.511	0.010

Links

Name	US Node	DS Node	Length (m)	US IL (m)	DS IL (m)	Dia (mm)	T of C (mins)	Rain (mm/hr)
29	329	430	10.123	114.332	114.281	225	4.39	50.0
30	430	DB SE6	9.358	114.206	113.675	225	4.73	50.0
31	DB SE6	OUTFALL INTO RIVER	38.304	112.300	111.000	225	5.07	50.0

Name	Vel (m/s)	Cap (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)
29	0.921	36.6	1.511	1.764	0.113
30	3.132	124.5	1.839	1.100	0.240
31	2.419	96.2	2.475	1.275	0.455

Simulation Settings

Rainfall Methodology	FSR	Analysis Speed	Normal
Rainfall Events	Singular	Skip Steady State	x
FSR Region	Scotland and Ireland	Drain Down Time (mins)	240
M5-60 (mm)	18.400	Additional Storage (m³/ha)	20.0
Ratio-R	0.216	Starting Level (m)	
Summer CV	1.000	Check Discharge Rate(s)	x
Winter CV	1.000	Check Discharge Volume	x

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 %)
1	0	0	0
5	0	0	0
10	0	0	0
30	0	0	0
100	20	0	0

Node DB SE5 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	115.175	Product Number	CTL-SHE-0046-1400-2325-1400
Design Depth (m)	2.325	Min Outlet Diameter (m)	0.075
Design Flow (l/s)	1.4	Min Node Diameter (mm)	1200

Node DB SE6 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	112.300	Product Number	CTL-SHE-0081-2900-1000-2900
Design Depth (m)	1.000	Min Outlet Diameter (m)	0.100
Design Flow (l/s)	2.9	Min Node Diameter (mm)	1200

Node DB SE5 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	115.475
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.30	Time to half empty (mins)	

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	0.4	0.0	0.326	90.0	0.0	1.326	0.0	0.0
0.325	0.4	0.0	1.325	90.0	0.0			

Node DB SE5 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	116.800
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	

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	90.0	0.0	1.000	90.0	0.0	1.001	0.0	0.0

Node DB SE6 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	112.300
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	

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	305.0	0.0	1.000	305.0	0.0	1.001	0.0	0.0

Node PP SE 6 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	117.080
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.30	Time to half empty (mins)	

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	108.0	0.0	0.350	108.0	0.0	0.351	0.0	0.0

Node PP SE 7 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	115.568
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	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	170.0	0.0	0.350	170.0	0.0	0.351	0.0	0.0

Other (defaults)

Entry Loss (manhole)	0.250	Entry Loss (junction)	0.000	Apply Recommended Losses	x
Exit Loss (manhole)	0.250	Exit Loss (junction)	0.000	Flood Risk (m)	0.300

Approval Settings

Node Size	✓	Cover Depth	✓
Node Losses	✓	Minimum Cover Depth (m)	
Link Size	✓	Maximum Cover Depth (m)	3.000
Minimum Diameter (mm)	150	Backdrops	✓
Link Length	✓	Minimum Backdrop Height (m)	
Maximum Length (m)	100.000	Maximum Backdrop Height (m)	1.500
Coordinates	✓	Full Bore Velocity	✓
Accuracy (m)	1.000	Minimum Full Bore Velocity (m/s)	
Crossings	✓	Maximum Full Bore Velocity (m/s)	3.000

Approval Settings

Proportional Velocity	✓	Flooding	✓
Return Period (years)		Return Period (years)	30
Minimum Proportional Velocity (m/s)	0.750	Time to Half Empty	x
Maximum Proportional Velocity (m/s)	3.000	Discharge Rates	✓
Surcharged Depth	✓	Discharge Volume	✓
Return Period (years)		100 year 360 minute (m ³)	
Maximum Surcharged Depth (m)	0.100		

Results for 1 year Critical Storm Duration. Lowest mass balance: 99.16%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
30 minute summer	PP SE 6	20	117.139	0.059	7.6	2.0289	0.0000	OK
180 minute summer	PP SE 7	108	115.613	0.045	5.9	7.7111	0.0000	OK
15 minute summer	323	10	116.747	0.032	3.2	0.0448	0.0000	OK
15 minute summer	324	10	115.896	0.065	6.4	0.1091	0.0000	OK
960 minute summer	325	630	116.662	0.672	3.5	1.2059	0.0000	SURCHARGED
960 minute summer	DB SE5	630	116.662	1.487	4.1	25.3742	0.0000	SURCHARGED
15 minute summer	327	10	115.703	0.057	10.5	0.0849	0.0000	OK
15 minute summer	328	10	114.422	0.032	1.6	0.0403	0.0000	OK
30 minute summer	329	18	114.397	0.065	6.2	0.0921	0.0000	OK
15 minute summer	430	10	114.283	0.077	26.8	0.1345	0.0000	OK
1440 minute summer	DB SE6	960	112.571	0.271	7.7	83.2054	0.0000	SURCHARGED
15 minute summer	OUTFALL INTO RIVER	1	111.000	0.000	1.1	0.0000	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)
30 minute summer	PP SE 6	PP SE 6	325	4.6	0.963	0.640	0.0858	
180 minute summer	PP SE 7	PP SE 7	329	3.1	0.924	0.388	0.0235	
15 minute summer	323	23	325	3.2	0.605	0.044	0.2000	
15 minute summer	324	24	327	6.4	0.684	0.174	0.1665	
960 minute summer	325	25	DB SE5	3.1	0.774	0.028	0.4502	
960 minute summer	DB SE5	Hydro-Brake®	DB SE6	1.1				
15 minute summer	327	27	430	10.3	1.303	0.139	0.3136	
15 minute summer	328	28	329	1.6	0.258	0.044	0.0736	
30 minute summer	329	29	430	6.1	0.670	0.167	0.0924	
15 minute summer	430	30	DB SE6	26.7	2.362	0.214	0.1057	
1440 minute summer	DB SE6	Hydro-Brake®	OUTFALL INTO RIVER	2.9				204.7

Results for 5 year Critical Storm Duration. Lowest mass balance: 99.16%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
30 minute summer	PP SE 6	20	117.162	0.082	11.5	2.8023	0.0000	OK
120 minute summer	PP SE 7	74	115.627	0.059	10.4	10.1395	0.0000	OK
1440 minute summer	323	960	116.919	0.204	0.6	0.2858	0.0000	OK
15 minute summer	324	10	115.912	0.081	9.6	0.1358	0.0000	OK
1440 minute summer	325	960	116.919	0.929	3.7	1.6663	0.0000	SURCHARGED
1440 minute summer	DB SE5	960	116.919	1.744	4.3	40.2035	0.0000	SURCHARGED
15 minute summer	327	10	115.717	0.071	15.8	0.1056	0.0000	OK
15 minute summer	328	10	114.430	0.039	2.5	0.0501	0.0000	OK
30 minute summer	329	18	114.416	0.084	9.8	0.1189	0.0000	OK
15 minute summer	430	10	114.305	0.099	41.2	0.1735	0.0000	OK
2160 minute summer	DB SE6	1500	112.701	0.401	8.1	122.9286	0.0000	SURCHARGED
15 minute summer	OUTFALL INTO RIVER	1	111.000	0.000	1.8	0.0000	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)
30 minute summer	PP SE 6	PP SE 6	325	7.0	1.030	0.974	0.1253	
120 minute summer	PP SE 7	PP SE 7	329	4.8	1.029	0.609	0.0331	
1440 minute summer	323	23	325	0.6	0.279	0.008	1.4364	
15 minute summer	324	24	327	9.6	0.763	0.262	0.2244	
1440 minute summer	325	25	DB SE5	3.3	0.761	0.029	0.4502	
1440 minute summer	DB SE5	Hydro-Brake®	DB SE6	1.2				
15 minute summer	327	27	430	15.6	1.465	0.211	0.4241	
15 minute summer	328	28	329	2.5	0.289	0.068	0.1036	
30 minute summer	329	29	430	9.8	0.759	0.267	0.1304	
15 minute summer	430	30	DB SE6	41.1	2.619	0.330	0.1468	
2160 minute summer	DB SE6	Hydro-Brake®	OUTFALL INTO RIVER	2.9				305.6

Results for 10 year Critical Storm Duration. Lowest mass balance: 99.16%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
30 minute summer	PP SE 6	20	117.174	0.094	13.3	3.2308	0.0000	OK
120 minute summer	PP SE 7	72	115.634	0.066	12.0	11.3756	0.0000	OK
1440 minute summer	323	960	116.995	0.280	0.6	0.3924	0.0000	SURCHARGED
15 minute summer	324	10	115.919	0.088	11.1	0.1473	0.0000	OK
1440 minute summer	325	960	116.995	1.005	3.9	1.8027	0.0000	SURCHARGED
1440 minute summer	DB SE5	960	116.995	1.820	4.7	47.1525	0.0000	SURCHARGED
15 minute summer	327	10	115.722	0.077	18.3	0.1144	0.0000	OK
15 minute summer	328	10	114.432	0.042	2.9	0.0539	0.0000	OK
30 minute summer	329	18	114.424	0.092	11.7	0.1310	0.0000	OK
15 minute summer	430	10	114.315	0.109	47.9	0.1907	0.0000	OK
2160 minute summer	DB SE6	1500	112.765	0.465	8.7	142.5880	0.0000	SURCHARGED
15 minute summer	OUTFALL INTO RIVER	1	111.000	0.000	2.1	0.0000	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)
30 minute summer	PP SE 6	PP SE 6	325	7.5	1.026	1.049	0.1341	
120 minute summer	PP SE 7	PP SE 7	329	5.7	1.066	0.720	0.0378	
1440 minute summer	323	23	325	0.6	0.262	0.008	1.4721	
15 minute summer	324	24	327	11.1	0.793	0.303	0.2498	
1440 minute summer	325	25	DB SE5	3.5	0.761	0.031	0.4502	
1440 minute summer	DB SE5	Hydro-Brake®	DB SE6	1.3				
15 minute summer	327	27	430	18.1	1.526	0.245	0.4729	
15 minute summer	328	28	329	2.9	0.301	0.079	0.1166	
30 minute summer	329	29	430	11.6	0.794	0.317	0.1482	
15 minute summer	430	30	DB SE6	47.8	2.710	0.383	0.1650	
2160 minute summer	DB SE6	Hydro-Brake®	OUTFALL INTO RIVER	2.9				308.6

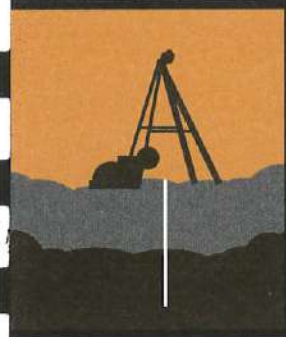
Results for 30 year Critical Storm Duration. Lowest mass balance: 99.16%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
30 minute summer	PP SE 6	21	117.207	0.127	17.0	4.3534	0.0000	SURCHARGED
120 minute summer	PP SE 7	72	115.648	0.079	15.1	13.7589	0.0000	OK
1440 minute summer	323	990	117.150	0.435	0.8	0.6097	0.0000	SURCHARGED
15 minute summer	324	10	115.932	0.101	14.1	0.1690	0.0000	OK
1440 minute summer	325	990	117.150	1.160	4.6	2.0807	0.0000	SURCHARGED
1440 minute summer	DB SE5	990	117.150	1.975	5.8	61.3151	0.0000	SURCHARGED
15 minute summer	327	10	115.733	0.088	23.2	0.1305	0.0000	OK
30 minute summer	328	18	114.441	0.051	3.4	0.0650	0.0000	OK
30 minute summer	329	18	114.440	0.108	15.4	0.1536	0.0000	OK
15 minute summer	430	10	114.334	0.128	60.9	0.2233	0.0000	OK
2880 minute summer	DB SE6	2160	112.912	0.612	8.8	187.5677	0.0000	SURCHARGED
15 minute summer	OUTFALL INTO RIVER	1	111.000	0.000	2.5	0.0000	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)
30 minute summer	PP SE 6	PP SE 6	325	7.7	1.032	1.076	0.1362	
120 minute summer	PP SE 7	PP SE 7	329	7.2	1.106	0.911	0.0461	
1440 minute summer	323	23	325	0.6	0.262	0.008	1.4721	
15 minute summer	324	24	327	14.1	0.843	0.385	0.2988	
1440 minute summer	325	25	DB SE5	4.4	0.761	0.039	0.4502	
1440 minute summer	DB SE5	Hydro-Brake®	DB SE6	1.3				
15 minute summer	327	27	430	23.0	1.627	0.312	0.5639	
30 minute summer	328	28	329	3.2	0.289	0.087	0.1479	
30 minute summer	329	29	430	15.2	0.848	0.415	0.1815	
15 minute summer	430	30	DB SE6	60.7	2.851	0.488	0.1993	
2880 minute summer	DB SE6	Hydro-Brake®	OUTFALL INTO RIVER	2.9				381.7

Results for 100 year +20% CC Critical Storm Duration. Lowest mass balance: 99.16%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
2160 minute summer	PP SE 6	1500	117.577	0.497	2.1	12.3176	0.0000	FLOOD RISK
120 minute summer	PP SE 7	76	115.693	0.125	23.2	21.7118	0.0000	SURCHARGED
2160 minute summer	323	1500	117.576	0.861	0.8	1.2067	0.0000	SURCHARGED
15 minute summer	324	10	115.964	0.133	22.0	0.2223	0.0000	OK
2160 minute summer	325	1500	117.576	1.586	5.1	2.8447	0.0000	FLOOD RISK
2160 minute summer	DB SE5	1500	117.576	2.401	6.4	100.2348	0.0000	FLOOD RISK
15 minute summer	327	10	115.760	0.114	36.2	0.1692	0.0000	OK
30 minute summer	328	18	114.481	0.091	5.4	0.1156	0.0000	OK
30 minute summer	329	18	114.480	0.148	25.0	0.2097	0.0000	OK
15 minute summer	430	10	114.389	0.183	95.7	0.3189	0.0000	OK
2160 minute summer	DB SE6	1800	113.295	0.995	14.3	305.1029	0.0000	SURCHARGED
15 minute summer	OUTFALL INTO RIVER	1	111.000	0.000	2.8	0.0000	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)
2160 minute summer	PP SE 6	PP SE 6	325	2.1	0.730	0.286	0.1408	
120 minute summer	PP SE 7	PP SE 7	329	8.4	1.109	1.070	0.0544	
2160 minute summer	323	23	325	0.7	0.236	0.010	1.4721	
15 minute summer	324	24	327	22.0	0.942	0.601	0.4173	
2160 minute summer	325	25	DB SE5	4.9	0.768	0.044	0.4502	
2160 minute summer	DB SE5	Hydro-Brake®	DB SE6	1.4				
15 minute summer	327	27	430	36.1	1.822	0.488	0.7884	
30 minute summer	328	28	329	5.1	0.286	0.139	0.2462	
30 minute summer	329	29	430	24.9	0.963	0.681	0.2619	
15 minute summer	430	30	DB SE6	95.4	3.068	0.766	0.2896	
2160 minute summer	DB SE6	Hydro-Brake®	OUTFALL INTO RIVER	2.9				337.3

E. Report On Site Investigation and Soil Infiltration Test



The Grange, 12th Lock Road Lucan Co. Dublin
Tel 01 601 5175 / 5176 Fax 01 601 5173
Email info@gii.ie Internet www.gii.ie

**GROUND
INVESTIGATIONS
IRELAND**

REPORT ON SITE INVESTIGATION

FOR

SITE AT WOODSTOWN

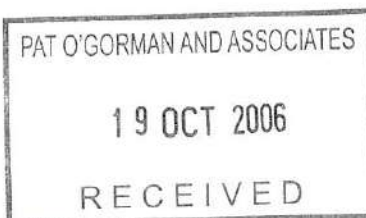
RATHFARHAM CO. DUBLIN

Prepared by: EurGeol Fergal McNamara PGeo

Signed:..... *F. McNamara* **.....**

Date: 16th October 2006

File No: 1285-09-06



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4.1 General.

Appendix 1 Trial Pit Records

Appendix 2 Site plan.

1.0 Preamble

On the instructions of Mr. Kevin Byrne of Newlyn Developments, a site investigation was carried out by Ground Investigations Ireland Ltd on the 21st of September 2006 on the above site.

2.0 Overview

2.1 Background

It is proposed to construct a housing development on the site. The site is currently in grass and disused and slopes steeply to the North.

2.2 Purpose and Scope

The purpose of the site investigation was to investigate subsurface soil conditions by means of trial pitting. The scope of the work undertaken for this study included the following:

- Visit project site to observe existing conditions
- Excavation of the subsurface exploration programme consisting of trial pits excavated to depths of 0.90 to 4.90mBGL.

3.0 Subsurface Exploration

3.1 General

Twenty number trial pits were excavated by Tracked excavator to depths varying from 0.90 to 4.90mBGL in positions selected to give a good general overview of site conditions. The locations of the exploratory holes are shown on the accompanying site plan.

3.2 Findings

The material encountered in Trial pit 1 to 10 was similar and in general consisted of TOPSOIL underlain by firm to stiff brown sandy gravelly CLAY which was in turn underlain by SCHIST rock which extends to final level.

The material encountered in Trial pits 11 to 20 was also similar and in general consisted of TOPSOIL underlain by firm to stiff brown sandy gravelly CLAY which was in turn underlain by stiff black sandy gravelly CLAY which extends to final level.

The above description represents the order of occurrence of the soil strata below the ground surface. However at specific locations one or more strata may be absent or the order of occurrence may vary. Detailed descriptions of the soil strata for each exploratory hole are included at the rear of this report.

3.3 Groundwater Conditions

Groundwater is noted on the logs where it occurs. We would point out that these excavations did not remain open for sufficiently long periods of time to determine the insitu water level. Further, groundwater levels vary with time of year, rainfall nearby construction and other factors.

4.0 Recommendations and Conclusions

4.1 General

The recommendations given and opinions expressed in this Report are based on the findings as detailed in the exploratory hole records. Where an opinion is expressed on the material between exploratory hole locations or below the final level of excavation, this is for guidance only and no liability can be accepted for its accuracy. No responsibility can be accepted for conditions which have not been revealed by the exploratory holes. It is further recommended that all bearing surfaces when excavated should be inspected to verify the information given in this Report.

It is proposed to construct a housing development on the site.

Due to the sloping nature of the site considerable cut will be involved, particularly in the area of TP s 1 to 10 where up to 8 to 9 metres of cut is anticipated. This will mean considerable rock excavation.

We would recommend that a number of rotary cored boreholes be carried out in this area in order to assess the nature strength and excavatibility of the bedrock.

In the area of Tp 11 to 20 considerable excavations will also be required. No bedrock was encountered in these Trial pits. We would recommend a number of cable percussion boreholes in this area in order to assess the nature, depth, groundwater conditions, and bearing capacity of the overburden and establish the depth to bedrock if required.

APPENDIX 1

TRIAL PIT RECORD

Project Name: Site at Woodstown, Ballycullen

Hole ID: TP1

Client: Newlyn Developments

Consultant: Pat O'Gorman

Location: Ballycullen Co. Dublin

Date: 21/09/2006

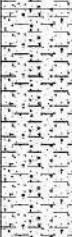
Excavator used: Tracked Excavator

Co-ordinates: -

Elevation: -

Project no. 1285-09-06

Logged by: F. McNamara

Strata Description	Legend	Depth	Level (mOD)	Samples / tests			Water Depth	Date
				Type	Depth	Result		
TOPSOIL		0.20						
Firm brown slightly sandy slightly gravelly CLAY		1						
Firm to stiff brown slightly sandy slightly gravelly CLAY		1.20						
Grey-green SCHIST recovered as angular gravel and cobbles.		2.00						
End of Trial pit at 2.20 m		2.20						
		3						
		4						

Remarks:

Stability: Trial pit stable
Water: No groundwater encountered
Remarks: Trial pit backfilled on completion, refusal at 2.20mBGL.

KEY

B Bulk disturbed sample
D Small disturbed sample
U Undisturbed sample

Dimensions:

Depth: 0.00



TRIAL PIT RECORD

Project Name: Site at Woodstown , Ballycullen

Hole ID: TP2

Client: Newlyn Developments

Consultant: Pat O'Gorman

Location: Ballycullen Co. Dublin

Date: 21/09/2006

Excavator used: Tracked Excavator

Co-ordinates: -

Elevation: -

Project no. 1285-09-06

Logged by: F.McNamara

Strata Description	Legend	Depth	Level (mOD)	Samples / tests			Water Depth	Date
				Type	Depth	Result		
TOPSOIL								
Firm brown slightly sandy slightly gravelly CLAY		0.25						
Firm to stiff brown slightly sandy slightly gravelly CLAY		1.00						
Grey-green SCHIST recovered as angular gravel and cobbles.		1.70						
End of Trial pit at 2.00 m		2.00						
		3						
		4						

Remarks:

Stability: Trial pit stable
Water: No groundwater encountered
Remarks: Trial pit backfilled on completion, refusal
at 2.00mBGL.

KEY

B Bulk disturbed sample
D Small disturbed sample
U Undisturbed sample

Dimensions:

Depth: 0.00



TRIAL PIT RECORD

Project Name: Site at Woodstown, Ballycullen

Hole ID: TP3

Client: Newlyn Developments

Consultant: Pat O'Gorman

Location: Ballycullen Co. Dublin

Date: 21/09/2006

Excavator used: Tracked Excavator

Co-ordinates: -

Elevation: -

Project no. 1285-09-06

Logged by: F.McNamara

Strata Description	Legend	Depth	Level (mOD)	Samples / tests			Water Depth	Date
				Type	Depth	Result		
TOPSOIL		0.20						
Firm to stiff brown slightly sandy gravelly CLAY		1						
Weathered grey-green SCHIST recovered as angular gravel and cobbles		1.20						
End of Trial pit at 1.90 m		1.90						
		2						
		3						
		4						

Remarks:

Stability: Trial pit stable
 Water: No groundwater encountered
 Remarks: Trial pit backfilled on completion, refusal at 1.90mBGL

KEY

B
D
U

Bulk disturbed sample
 Small disturbed sample
 Undisturbed sample

Dimensions:

Depth: 0.00
 1.90



TRIAL PIT RECORD

Project Name: Site at Woodstown, Ballycullen

Hole ID: TP4

Client: Newlyn Developments
 Consultant: Pat O'Gorman
 Location: Ballycullen Co. Dublin
 Date: 21/09/2006
 Excavator used: Tracked Excavator

Co-ordinates: -
 Elevation: -
 Project no. 1285-09-06
 Logged by: F. McNamara

Strata Description	Legend	Depth	Level (mOD)	Samples / tests			Water Depth	Date
				Type	Depth	Result		
TOPSOIL								
Firm brown slightly sandy gravelly CLAY/SILT		0.20						
Weathered grey-green SCHIST recovered as angular gravel and cobbles		0.50						
End of Trial pit at 1.90 m		1.50						
		2						
		3						
		4						

Remarks:

Stability: Trial pit stable
 Water: No groundwater encountered
 Remarks: Trial pit backfilled on completion, refusal at 1.50mBGL

KEY

B Bulk disturbed sample
 D Small disturbed sample
 U Uncoloured sample

Dimensions:

Depth: 0.00
 1.90



TRIAL PIT RECORD

Project Name: Site at Woodstown , Ballycullen

Hole ID: TP5

Client: Newlyn Developments

Consultant: Pat O'Gorman

Location: Ballycullen Co. Dublin

Date: 21/09/2006

Excavator used: Tracked Excavator

Co-ordinates: -

Elevation: -

Project no. 1285-09-06

Logged by: F.McNamara

Strata Description	Legend	Depth	Level (mOD)	Samples / tests			Water Depth	Date
				Type	Depth	Result		
TOPSOIL								
Firm brown sandy gravelly SILT		0.20						
Grey-green SCHIST recovered as angular gravel and cobbles.		0.40						
End of Trial pit at 0.90 m		0.90						
		1						
		2						
		3						
		4						

Remarks:

Stability: Trial pit stable
Water: No groundwater encountered
Remarks: Trial pit backfilled on completion, refusal at 90mBGL.

KEY

B Bulk disturbed sample
D Small disturbed sample
U Undisturbed sample

Dimensions:

Depth:
0.90

0.00



TRIAL PIT RECORD

Project Name: Site at Woodstown , Ballycullen

Hole ID: TP6

Client: Newlyn Developments

Consultant: Pat O'Gorman

Location: Ballycullen Co. Dublin

Date: 21/09/2006

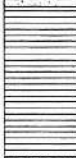
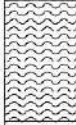
Excavator used: Tracked Excavator

Co-ordinates: -

Elevation: -

Project no. 1285-09-06

Logged by: F.McNamara

Strata Description	Legend	Depth	Level (mOD)	Samples / tests			Water Depth	Date
				Type	Depth	Result		
TOPSOIL								
Soft grey-brown sandy CLAY		0.20						
Grey- green SHALE recovered as angular gravel		0.50						
Grey SCHIST recovered as gravel and cobbles		1.00						
End of Trial pit at 1.40 m		1.40						
		2						
		3						
		4						

Remarks:

Stability: Trial pit stable
Water: No groundwater encountered
Remarks: Trial pit backfilled on completion, refusal at 1.40mBGL

KEY

B Bulk disturbed sample.
D Small disturbed sample
U Undisturbed sample

Dimensions:

Depth:

1.40

0.00



TRIAL PIT RECORD

Project Name: Site at Woodstown , Ballycullen

Hole ID: TP7

Client: Newlyn Developments

Consultant: Pat O'Gorman

Location: Ballycullen Co. Dublin

Date: 21/09/2006

Excavator used: Tracked Excavator

Co-ordinates: -

Elevation: -

Project no. 1285-09-06

Logged by: F.McNamara

Strata Description	Legend	Depth	Level (mOD)	Samples / tests			Water Depth	Date
				Type	Depth	Result		
TOPSOIL		0.20						
Soft to firm brown sandy gravelly CLAY								
Weathered grey SCHIST recovered as angular gravel and cobbles		1.60						
End of Trial pit at 2.00 m		2.00						
		3						
		4						

Remarks:

Stability: Trial pit stable
Water: No groundwater encountered
Remarks: Trial pit backfilled on completion, refusal at 2.00mBGL

KEY

B Bulk disturbed sample
D Small disturbed sample
U Undisturbed sample

Dimensions:

Depth: 2.00

0.00



TRIAL PIT RECORD

Project Name: Site at Woodstown, Ballycullen

Hole ID: TP8

Client: Newlyn Developments

Consultant: Pat O'Gorman

Location: Ballycullen Co. Dublin

Date: 21/09/2006

Excavator used: Tracked Excavator

Co-ordinates: -

Elevation: -

Project no. 1285-09-06

Logged by: F. McNamara

Strata Description	Legend	Depth	Level (mOD)	Samples / tests			Water Depth	Date
				Type	Depth	Result		
TOPSOIL		0.20						
Firm brown slightly sandy slightly gravelly CLAY		1.20						
Firm to stiff brown slightly sandy slightly gravelly CLAY with occasional cobbles		3.08						
Weathered grey SCHIST recovered as angular gravel and cobbles		3.90						
End of Trial pit at 3.90 m		4						

Remarks:

Stability: Trial pit stable
Water: No groundwater encountered
Remarks: Trial pit backfilled on completion

KEY

B Bulk disturbed sample
D Small disturbed sample
U Undisturbed sample

Dimensions:

Depth: 0.00
3.90



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TRIAL PIT RECORD

Project Name: Site at Woodstown, Ballycullen

Hole ID: TP9

Client: Newlyn Developments

Consultant: Pat O'Gorman

Location: Ballycullen Co. Dublin

Date: 21/09/2006

Excavator used: Tracked Excavator

Co-ordinates: -

Elevation: -

Project no. 1285-09-06

Logged by: F. McNamara

Strata Description	Legend	Depth	Level (mOD)	Samples / tests			Water Depth	Date
				Type	Depth	Result		
TOPSOIL		0.20						
Firm brown slightly sandy slightly gravelly CLAY		1.00						
Firm to stiff brown slightly sandy slightly gravelly CLAY with some cobbles and occasional boulders		2						
		3						
		4						
		4.50						
Weathered grey SCHIST recovered as angular gravel and cobbles		4.90						
End of Trial pit at 4.90 m								

Remarks:

Stability: Trial pit stable
Water: No groundwater encountered
Remarks: Trial pit backfilled on completion

KEY

B Bulk disturbed sample.
D Small disturbed sample
U Undisturbed sample

Dimensions:

Depth: 0.00
4.90



TRIAL PIT RECORD

Project Name: Site at Woodstown, Ballycullen

Hole ID: TP10

Client: Newlyn Developments

Consultant: Pat O'Gorman

Location: Ballycullen Co. Dublin

Date: 21/09/2006

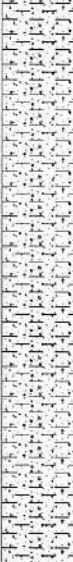
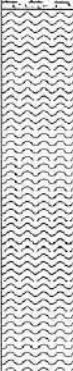
Excavator used: Tracked Excavator

Co-ordinates: -

Elevation: -

Project no. 1285-09-06

Logged by: F. McNamara

Strata Description	Legend	Depth	Level (mOD)	Samples / tests			Water Depth	Date
				Type	Depth	Result		
TOPSOIL		0.20						
Firm to stiff brown slightly sandy gravelly CLAY		1						
Weathered grey-green SCHIST recovered as angular gravel and cobbles		2.10						
End of Trial pit at 3.30 m		3.30						
		4						

Remarks:

Stability: Trial pit stable
Water: No groundwater encountered
Remarks: Trial pit backfilled on completion

KEY

B Bulk disturbed sample
D Small disturbed sample
U Undisturbed sample

Dimensions:

Depth: 0.00



TRIAL PIT RECORD

Project Name: Site at Woodstown , Ballycullen

Hole ID: TP11

Client: Newlyn Developments

Consultant: Pat O'Gorman

Location: Ballycullen Co. Dublin

Date: 21/09/2006

Excavator used: Tracked Excavator

Co-ordinates: -

Elevation: -

Project no. 1285-09-06

Logged by: F.McNamara

Strata Description	Legend	Depth	Level (mOD)	Samples / tests			Water Depth	Date
				Type	Depth	Result		
TOPSOIL								
Soft to firm brown sandy CLAY		0.25						
Firm to stiff dark brown sandy gravelly CLAY		0.90						
Very stiff brown sandy gravelly CLAY with some cobbles and occasional boulders		2.00						
End of Trial pit at 3.70 m		3.70						
		4						

Remarks:

Stability: Trial pit stable
Water: No groundwater encountered
Remarks: Trial pit backfilled on completion

KEY

B Bulk disturbed sample
D Small disturbed sample
U Undisturbed sample

Dimensions:

Depth: 3.70



TRIAL PIT RECORD

Project Name: Site at Woodstown, Ballycullen

Hole ID: TP12

Client: Newlyn Developments

Consultant: Pat O'Gorman

Location: Ballycullen Co. Dublin

Date: 21/09/2006

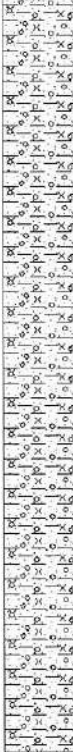
Excavator used: Tracked Excavator

Co-ordinates: -

Elevation: -

Project no. 1285-09-06

Logged by: F. McNamara

Strata Description	Legend	Depth	Level (mOD)	Samples / tests			Water Depth	Date
				Type	Depth	Result		
TOPSOIL								
Soft yellowish brown sandy SILT		0.25						
Firm to stiff brown slightly sandy gravelly CLAY with some cobbles and occasional boulders		0.50						
		1						
		2						
		3.00						
Very stiff black sandy gravelly CLAY with some cobbles and boulders.		3.40						
End of Trial pit at 3.40 m								
		4						

Remarks:

Stability: Trial pit stable
Water: No groundwater encountered
Remarks: Trial pit backfilled on completion

KEY

B Bulk disturbed sample
D Small disturbed sample
U Undisturbed sample

Dimensions:

Depth: 0.00
3.40



TRIAL PIT RECORD

Project Name: Site at Woodstown , Ballycullen

Hole ID: TP13

Client: Newlyn Developments

Consultant: Pat O'Gorman

Location: Ballycullen Co. Dublin

Date: 21/09/2006

Excavator used: Tracked Excavator

Co-ordinates: -

Elevation: -

Project no. 1285-09-06

Logged by: F.McNamara

Strata Description	Legend	Depth	Level (mOD)	Samples / tests			Water Depth	Date
				Type	Depth	Result		
TOPSOIL		0.25						
Stiff brown sandy gravelly CLAY with occasional boulders		1						
Very stiff brown sandy gravelly CLAY with some cobbles and boulders		2.50						
End of Trial pit at 3.80 m		3.80						

Remarks:

Stability: Trial pit stable
Water: No groundwater encountered
Remarks: Trial pit backfilled on completion

KEY

B Bulk disturbed sample.
D Small disturbed sample
U Undisturbed sample

Dimensions:

Depth: 0.00
3.80



TRIAL PIT RECORD

Project Name: Site at Woodstown , Ballycullen

Hole ID: TP14

Client: Newlyn Developments

Consultant: Pat O'Gorman

Location: Ballycullen Co. Dublin

Date: 21/09/2006

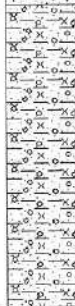
Excavator used: Tracked Excavator

Co-ordinates: -

Elevation: -

Project no. 1285-09-06

Logged by: F.McNamara

Strata Description	Legend	Depth	Level (mOD)	Samples / tests			Water Depth	Date
				Type	Depth	Result		
TOPSOIL		0.25						
Firm brown slightly sandy slightly gravelly CLAY		1						
stiff brown slightly sandy gravelly CLAY with some cobbles and boulders		2.00						
End of Trial pit at 3.00 m		3.00						
		4						

Remarks:

Stability: Trial pit stable

Water: No groundwater encountered

Remarks: Trial pit backfilled on completion

KEY

B
D
U

Bulk disturbed sample
Small disturbed sample
Undisturbed sample

Dimensions:

Depth:

3.00

0.00



TRIAL PIT RECORD

Project Name: Site at Woodstown , Ballycullen

Hole ID: TP15

Client: Newlyn Developments

Consultant: Pat O'Gorman

Location: Ballycullen Co. Dublin

Date: 21/09/2006

Excavator used: Tracked Excavator

Co-ordinates: -

Elevation: -

Project no. 1285-09-06

Logged by: F.McNamara

Strata Description	Legend	Depth	Level (mOD)	Samples / tests			Water Depth	Date
				Type	Depth	Result		
TOPSOIL		0.20						
Stiff brown sandy gravelly CLAY with some cobbles		1						
		2						
		3						
Very stiff black sandy gravelly CLAY with some cobbles and boulders		3.30						
End of Trial pit at 3.80 m		3.80						
		4						

Remarks:

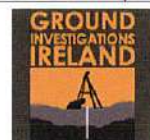
Stability: Trial pit stable
 Water: No groundwater encountered
 Remarks: Trial pit backfilled on completion

KEY

B Bulk disturbed sample.
 D Small disturbed sample
 U Undisturbed sample

Dimensions:

Depth: 0.00
 3.80



TRIAL PIT RECORD

Project Name: Site at Woodstown , Ballycullen

Hole ID: TP16

Client: Newlyn Developments

Consultant: Pat O'Gorman

Location: Ballycullen Co. Dublin

Date: 21/09/2006

Excavator used: Tracked Excavator

Co-ordinates: -

Elevation: -

Project no. 1285-09-06

Logged by: F.McNamara

Strata Description	Legend	Depth	Level (mOD)	Samples / tests			Water Depth	Date
				Type	Depth	Result		
TOPSOIL								
Stiff brown slightly sandy gravelly CLAY with some cobbles		0.20						
		1						
		2						
		3						
		3.50						
Very stiff black sandy gravelly CLAY with some cobbles and boulders		3.80						
End of Trial pit at 3.80 m		4						

Remarks:

Stability: Trial pit stable

Water: No groundwater encountered

Remarks: Trial pit backfilled on completion

KEY

B Bulk disturbed sample.
D Small disturbed sample
U Undisturbed sample

Dimensions:

Depth: 0.00
3.80



TRIAL PIT RECORD

Project Name: Site at Woodstown , Ballycullen

Hole ID: TP17

Client: Newlyn Developments
 Consultant: Pat O'Gorman
 Location: Ballycullen Co. Dublin
 Date: 21/09/2006
 Excavator used: Tracked Excavator

Co-ordinates: -
 Elevation: -
 Project no. 1285-09-06
 Logged by: F.McNamara

Strata Description	Legend	Depth	Level (mOD)	Samples / tests			Water Depth	Date
				Type	Depth	Result		
TOPSOIL								
Firm brown sandy gravelly CLAY		0.25						
Stiff brown sandy gravelly CLAY with some cobbles and boulders		0.60						
		1						
		2						
		2.80						
Very stiff grey sandy gravelly CLAY with some cobbles and boulders		3						
		3.50						
End of Trial pit at 3.50 m		4						

Remarks:

Stability: Trial pit stable
 Water: No groundwater encountered
 Remarks: Trial pit backfilled on completion

KEY

B
D
U

Bulk disturbed sample.
 Small disturbed sample
 Undisturbed sample

Dimensions:

Depth:
3.50

0.00



TRIAL PIT RECORD

Project Name: Site at Woodstown, Ballycullen

Hole ID: TP18

Client: Newlyn Developments
 Consultant: Pat O'Gorman
 Location: Ballycullen Co. Dublin
 Date: 21/09/2006
 Excavator used: Tracked Excavator

Co-ordinates: -
 Elevation: -
 Project no. 1285-09-06
 Logged by: F. McNamara

Strata Description	Legend	Depth	Level (mOD)	Samples / tests			Water Depth	Date
				Type	Depth	Result		
TOPSOIL								
Firm brown sandy CLAY		0.25						
Stiff brown sandy gravelly CLAY with some cobbles and boulders		0.50						
		1						
		2						
		3.00						
Very stiff grey sandy gravelly CLAY with some cobbles and boulders		3.50						
End of Trial pit at 3.50 m								
		4						

Remarks:

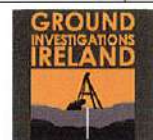
Stability: Trial pit stable
 Water: No groundwater encountered
 Remarks: Trial pit backfilled on completion

KEY

B Bulk disturbed sample
 D Small disturbed sample
 U Undisturbed sample

Dimensions:

Depth: 0.00
 3.50



TRIAL PIT RECORD

Project Name: Site at Woodstown, Ballycullen

Hole ID: TP19

Client: Newlyn Developments
 Consultant: Pat O'Gorman
 Location: Ballycullen Co. Dublin
 Date: 21/09/2006
 Excavator used: Tracked Excavator

Co-ordinates: -
 Elevation: -
 Project no. 1285-09-06
 Logged by: F. McNamara

Strata Description	Legend	Depth	Level (mOD)	Samples / tests			Water Depth	Date
				Type	Depth	Result		
TOPSOIL		0.20						
Firm to stiff brown slightly sandy gravelly CLAY								
Stiff brown slightly sandy slightly gravelly CLAY with cobbles		1.00						
Very stiff black sandy gravelly CLAY with some cobbles and boulders		3.00						
End of Trial pit at 3.50 m		3.50						

Remarks:

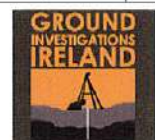
Stability: Trial pit stable
 Water: No groundwater encountered
 Remarks: Trial pit backfilled on completion

KEY

B Bulk disturbed sample.
 D Small disturbed sample
 U Undisturbed sample

Dimensions:

Depth: 0.00



TRIAL PIT RECORD

Project Name: Site at Woodstown , Ballycullen

Hole ID: TP20

Client: Newlyn Developments

Consultant: Pat O'Gorman

Location: Ballycullen Co. Dublin

Date: 21/09/2006

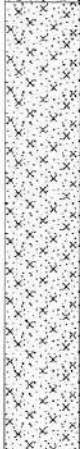
Excavator used: Tracked Excavator

Co-ordinates: -

Elevation: -

Project no. 1285-09-06

Logged by: F.McNamara

Strata Description	Legend	Depth	Level (mOD)	Samples / tests			Water Depth	Date
				Type	Depth	Result		
TOPSOIL		0.20						
Firm to stiff brown slightly sandy gravelly CLAY		1						
Brown fine silty SAND with lenses of clayey gravel		1.30						
Very stiff brown sandy gravelly CLAY with some cobbles		2.80						
End of Trial pit at 4.00 m		4.00						

Remarks:

Stability: Trial pit stable
Water: No groundwater encountered
Remarks: Trial pit backfilled on completion

KEY

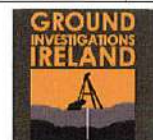
B
D
U

Bulk disturbed sample
Small disturbed sample
Undisturbed sample

Dimensions:

Depth:
4.00

0.00



APPENDIX 2

SITE PLAN

TRIAL PIT LOCATION



Soil Infiltration Test for Design of Soakaway
At
Woodtown, Ballycullen

Prepared by

Dr. Eugene Bolton
Senior Consultant
Trinity Green

Report on Soil Infiltration Test

Introduction

To manage the surface water from the development it is proposed to construct Soakaways in accordance with BRE Digest365. As part of this, the infiltration capacity of the soil was assessed. Dr. Eugene Bolton of Trinity Green Environmental Consultants was commissioned to carry out soil Infiltration Tests in accordance with BRE Digest365 to establish the suitability of the site for disposal of water.

Visual assessment of Site

The site is located in a Rural setting where the landscape slopes from south to north. On the day of the test the ground conditions were good with the surface dry and no surface water. There is no vegetation on the site or in adjoining fields that would indicate poor soakage. A total of 4 tests were completed across the site two of which were near the southern boundary with the remaining two near the north end of the site. The site consists of 2 adjoining fields. There were two tests in the east field and 2 in the west. Location of the tests is shown in the attached.

Location 1 East Field; South Boundary

Trial Pit excavated to 1.4m bgl

Top soil to 200mm, Clay to 0.4m bgl from 400mm to 1.4m bgl there was fractured rock. The GSI describes the rock formation as Dark slate-schist, quartzite & coticule forming part of the Butter Mountain Formation. It was possible to hack out the first 1m of the rock but the rock was less fractured and wasn't possible to excavate any deeper than 1.4m.

Infiltration Tests

The Infiltration rate, generally expressed as metres per second, is the volume of water that enters the soil over a unit area and unit time. In order to obtain this measurement a pit is excavated and filled with water. The fall in the level of the water is recorded over time. The test pit had dimensions

Length 1.2m

Width 0.3m

Depth 0.8m

The base of the pit was filled with water to a depth of 400mm and the drop in the water level was followed over time

Results

The time required for the level to fall from 75% full to 25% full (ie 50% drop) – from a water depth of 0.3m to a water depth of 0.1m is estimated to be 343min.

Table 1 – Time taken for water level to fall

Elapsed Time (Mins)	Depth of Water (mm)
0	400
28	340
187	220
297	150
403	100

Infiltration rate (f) = Volume of water used/unit exposed area /unit time

$$\begin{aligned}\text{Volume} &= \text{pit length (m)} \times \text{Width (m)} \times \text{Drop in water level (m)} \\ &= 1.3 \times 0.3 \times 0.2 \\ &= 0.078\text{m}^3\end{aligned}$$

$$\begin{aligned}\text{Exposed area} &= (\text{Length} \times \text{Half the effective height} \times 2) + (\text{Width} \times \text{Half the effective height} \times 2) + \text{Base area} \\ &= (1.3 \times 0.2 \times 2) + (0.3 \times 0.2 \times 2) + (1.3 \times 0.3) \\ &= 1.03\text{m}^2\end{aligned}$$

$$\text{Time} = 343\text{min}$$

$$\text{Infiltration rate (f)} = 0.078/1.03/343$$

$$= 2.2\text{E-}04 \text{ m/min}$$

$$f = 3.6\text{E-}06 \text{ m/sec}$$

Location 2 East Field; North Boundary

Trial Pit excavated to 2.1 bgl

Topsoil to 200mm, Clay to 1900mm Dark brown clay – soft to firm

From 1.9m to 2.1m bgl the soil was a Granite Gravel – very hard

There was no evidence of a watertable.

According to the GSI the granite bedrock is further south so the presence of granite-like material would not be expected at this location. Given the pit is small it may be a boulder

that was encountered rather than bedrock especially given the nature of the rock encountered at location 1 above.

Infiltration Tests

A separate pit was excavated for the infiltration test.

The Infiltration rate, generally expressed as metres per second, is the volume of water that enters the soil over a unit area and unit time. In order to obtain this measurement a pit is excavated and filled with water. The fall in the level of the water is recorded over time.

The test pit had dimensions

Length 1.2m

Width 0.3m

Depth 1.4 m

The base of the pit was filled with water to a depth of 1,000mm and the drop in the water level was followed over time

Results

The time required for the level to fall from 75% full to 25% full (ie 50% drop) – from a water depth of 0.75m to a water depth of 0.25m was assessed.

Table 1 – Time taken for water level to fall

Elapsed Time (Mins)	Depth of Water (mm)
0	1000
19	990
165	960
220	960
310	960

As there was no further fall in the water level after 165 min this test was deemed to have failed.

Location 3 West Field; South Boundary

Trial Pit excavated to 1.9m bgl

Top soil to 200mm, Clay to 1.3m bgl from 1.3m to 1.7m bgl the soil was a gravely silt/clay

There was water in the pit with the settled water level at 1.4m bgl. However there is clear evidence of mottling at 1.0m bgl

Infiltration Tests

The Infiltration rate, generally expressed as metres per second, is the volume of water that enters the soil over a unit area and unit time. In order to obtain this measurement a pit is excavated and filled with water. The fall in the level of the water is recorded over time. The test pit had dimensions

Length 1.3m

Width 0.3m

Depth 0.8m

The base of the pit was filled with water to a depth of 500mm and the drop in the water level was followed over time

Results

The time required for the level to fall from 75% full to 25% full (ie 50% drop) – from a water depth of 0.375m to a water depth of 0.125m was assessed.

Table 1 – Time taken for water level to fall

Elapsed Time (Mins)	Depth of Water (mm)
0	500
32	490
67	490
192	490

As there was no further fall in the water level after 32 min this test was deemed to have failed. Due to a combination of poor soakage and a high watertable (Probably a perched watertable) it is not feasible to construct a soakaway in this area

Location 4 – West Field; North Boundary

Trial pit excavated to 2.4m Bgl. 300mm top soil, down to 2m the subsoil is a clay with low gravel and is soft to Firm. Between 2m and 2.4m bgl the soil is a gravely silt that is firm to stiff

Infiltration Tests

The Infiltration rate, generally expressed as metres per second, is the volume of water that enters the soil over a unit area and unit time. In order to obtain this measurement a pit is excavated and filled with water. The fall in the level of the water is recorded over time. A separate test pit had dimensions

Length 1.2m

Width 0.3m

Depth 1.3m

The base of the pit was filled with water to a depth of 900mm and the drop in the water level was followed over time

Results

The time required for the level to fall from 75% full to 25% full (ie 50% drop) – from a water depth of 0.675m to a water depth of 0.225m is estimated to be 1473min.

Table 1 – Time taken for water level to fall

Elapsed Time (Mins)	Depth of Water (mm)
0	900
25	830
42	800
72	720
192	700
288	640
374	600
518	560
1256	363

Infiltration rate (f) = Volume of water used/unit exposed area /unit time

Volume = pit length (m) x Width (m) x Drop in water level (m)
= 1.3 x 0.3 x 0.45
= 0.1755m³

Exposed area = (Length x Half the effective height x 2) + (Width x Half the effective height x 2) + Base area
= (1.3 x 0.45 x 2) + (0.3 x 0.45 x 2) + (1.3 x 0.3)
= 1.83m²

Time = 1473min

Infiltration rate (f) = $0.1755/1.83/1473\text{m/min}$

= $6.5\text{E-}05\text{ m/min}$

$f = 1.1\text{E-}06\text{ m/sec}$

Conclusions

Each test has produced a different result. However the observations suggest there is a high level of variation due to differences in the depth of the overburden and the presence of what is most likely a perched watertable as observed at location 3. In general there is little scope for the design of soakaways. Even at location 4 where the soakage is at its best it has limited permeability

Signed
Dr. Eugene Bolton
Senior Consultant
Trinity Green

02/11/2020

Photo

Location 1

Trial Pit – Depth 1.4 –Fractured rock at 400mm bgl



Test Pit before water added – Depth 0.8m



Pit at start of test



Location 2 – East Field near Rorth boundary

Trial Pit – 2.1m deep



Test Pit – 1.4m deep



Test Pit during test



Location 3 – West Field; near south border

Trial pit – Depth 1.9m Water at 1.4



Test Pit – Depth 0.8m



Test pit during test



Location 4 – West Field; near north border

Trial Pit – 2.2m deep



Test Pit – Depth 1.3m



Test Pit - during test





Location 3

Location 4

Location 1

Location 2

F. Uisce Éireann Statement of Design Acceptance

Lydian Mugo
Waterman Moylan
Block S
Eastpoint Business Park
Alfie Byrne Road
Dublin
D03H3F4

Uisce Éireann
Bosca OP 448
Oifig Sheachadta na
Cathrach Theas
Cathair Chorcaí

Uisce Éireann
PO Box 448
South City
Delivery Office
Cork City

10 April 2025

www.water.ie

Re: Design Submission for Woodstown, Ballycullen, Dublin, Dublin (the “Development”) (the “Design Submission”) / Connection Reference No: CDS24010539

Dear Lydian Mugo,

Many thanks for your recent Design Submission.

We have reviewed your proposal for the connection(s) at the Development. Based on the information provided, which included the documents outlined in Appendix A to this letter, Uisce Éireann has no objection to your proposals.

This letter does not constitute an offer, in whole or in part, to provide a connection to any Uisce Éireann infrastructure. Before you can connect to our network you must sign a connection agreement with Uisce Éireann. This can be applied for by completing the connection application form at www.water.ie/connections. Uisce Éireann's current charges for water and wastewater connections are set out in the Water Charges Plan as approved by the Commission for Regulation of Utilities (CRU) (https://www.cru.ie/document_group/irish-waters-water-charges-plan-2018/).

You the Customer (including any designers/contractors or other related parties appointed by you) is entirely responsible for the design and construction of all water and/or wastewater infrastructure within the Development which is necessary to facilitate connection(s) from the boundary of the Development to Uisce Éireann's network(s) (the “**Self-Lay Works**”), as reflected in your Design Submission. Acceptance of the Design Submission by Uisce Éireann does not, in any way, render Uisce Éireann liable for any elements of the design and/or construction of the Self-Lay Works.

If you have any further questions, please contact your Uisce Éireann representative:

Name: Alicia Ros Bernal

Email: ailciarosbernal.bernal@water.ie

Yours sincerely,



Dermot Phelan
Connections Delivery Manager

Stiúrthóirí / Directors: Niall Gleeson (POF / CEO), Jerry Grant (Cathaoirleach / Chairperson), Gerard Britchfield, Liz Joyce, Michael Nolan, Patricia King, Eileen Maher, Cathy Mannion, Paul Reid, Michael Walsh.

Oifig Chláraithe / Registered Office: Teach Colvill, 24-26 Sráid Thalbóid, Baile Átha Cliath 1, D01 NP86 / Colvill House, 24-26 Talbot Street, Dublin, Ireland D01NP86

Is cuideachta ghníomhaíochta ainmnithe atá faoi theorainn scaireanna é Uisce Éireann / Uisce Éireann is a designated activity company, limited by shares. Cláraithe in Éirinn Uimh.: 530363 / Registered in Ireland No.: 530363.

Appendix A

Document Title & Revision

- BYCN-WM-ZZ-XX-DR-C-P1300 - Proposed Watermain Layout-Sheet 1 of 2
- BYCN-WM-ZZ-XX-DR-C-P1301 - Proposed Watermain Layout-Sheet 2 of 2
- BYCN-WM-ZZ-XX-DR-C-P1200 - Proposed Drainage Layout-Sheet 1 of 2
- BYCN-WM-ZZ-XX-DR-C-P1201 - Proposed Drainage Layout-Sheet 2 of 2
- 24-007 Foul Longsection - East Catchment
- 24-007 Foul Longsection - West Catchment

Additional Comments

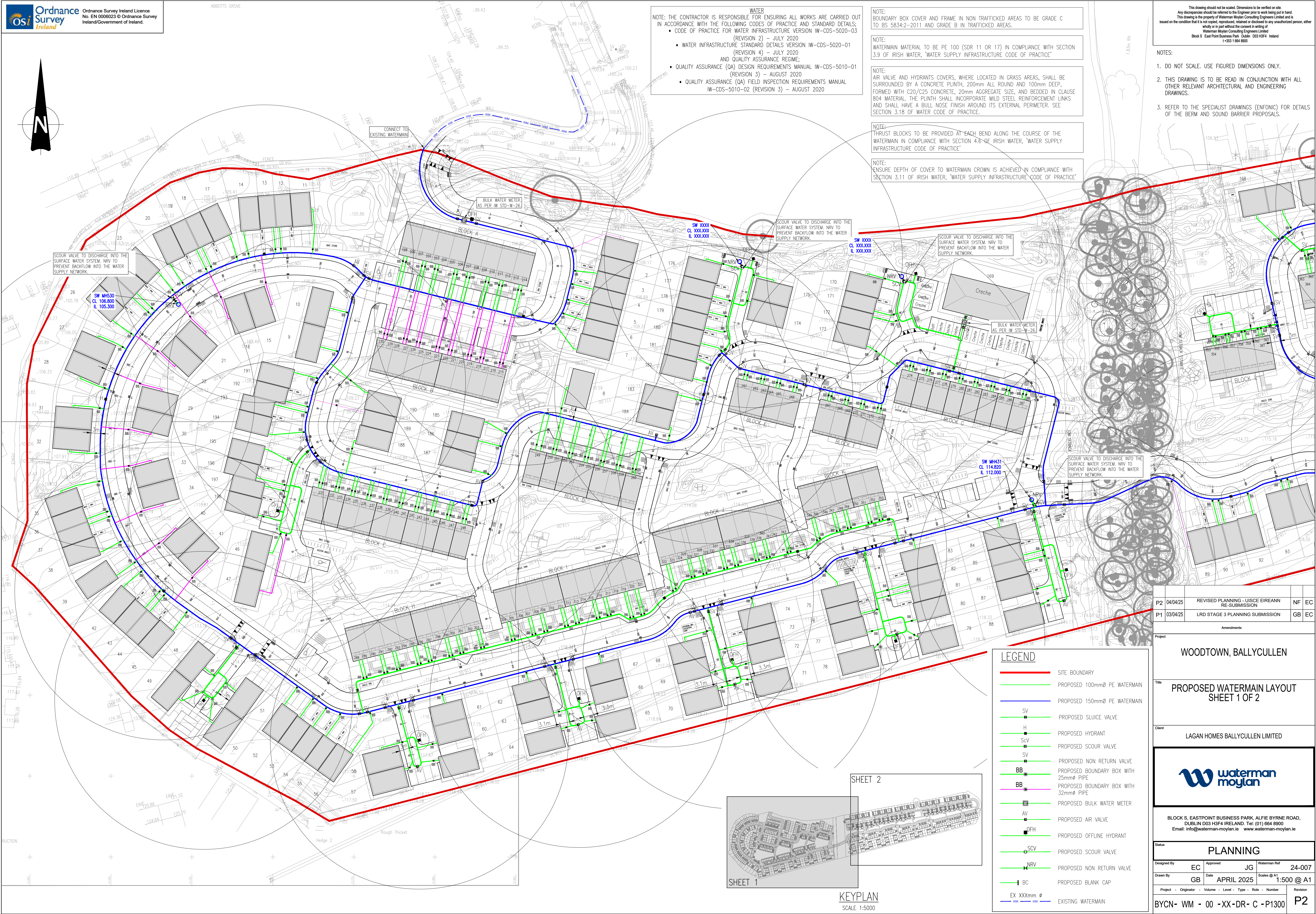
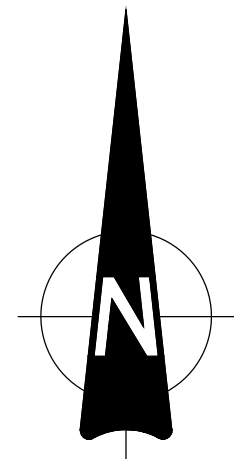
The design submission will be subject to further technical review at connection application stage.

Uisce Éireann cannot guarantee that its Network in any location will have the capacity to deliver a particular flow rate and associated residual pressure to meet the requirements of the relevant Fire Authority, see Section 1.17 of Water Code of Practice.

The location of the air valves on streets without footpaths, or in cases where it is difficult to position them in areas with no traffic, may be subject to further assessment during the connection application stage.

For further information, visit www.water.ie/connections

Notwithstanding any matters listed above, the Customer (including any appointed designers/contractors, etc.) is entirely responsible for the design and construction of the Self-Lay Works. Acceptance of the Design Submission by Uisce Éireann will not, in any way, render Uisce Éireann liable for any elements of the design and/or construction of the Self-Lay Works.



NOTE: THE CONTRACTOR IS RESPONSIBLE FOR ENSURING ALL WORKS ARE CARRIED OUT IN ACCORDANCE WITH THE FOLLOWING CODES OF PRACTICE AND STANDARD DETAILS;

- CODE OF PRACTICE FOR WATER INFRASTRUCTURE VERSION IW-CDS-5020-03 (REVISION 2) - JULY 2020
- WATER INFRASTRUCTURE STANDARD DETAILS VERSION IW-CDS-5020-01 (REVISION 4) - JULY 2020 AND QUALITY ASSURANCE REGIME;
- QUALITY ASSURANCE (QA) DESIGN REQUIREMENTS MANUAL IW-CDS-5010-01 (REVISION 3) - AUGUST 2020
- QUALITY ASSURANCE (QA) FIELD INSPECTION REQUIREMENTS MANUAL IW-CDS-5010-02 (REVISION 3) - AUGUST 2020

NOTE: BOUNDARY BOX COVER AND FRAME IN NON TRAFFICKED AREAS TO BE GRADE C TO BS 5834-2-2011 AND GRADE B IN TRAFFICKED AREAS.

NOTE: WATERMAIN MATERIAL TO BE PE 100 (SDR 11 OR 17) IN COMPLIANCE WITH SECTION 3.9 OF IRISH WATER, 'WATER SUPPLY INFRASTRUCTURE CODE OF PRACTICE'

NOTE: AIR VALVE AND HYDRANTS COVERS, WHERE LOCATED IN GRASS AREAS, SHALL BE SURROUNDED BY A CONCRETE PLINTH, 200mm ALL ROUND AND 100mm DEEP, FORMED WITH C20/C25 CONCRETE, 20mm AGGREGATE SIZE, AND BEDDED IN CLAUSE 804 MATERIAL. THE PLINTH SHALL INCORPORATE MILD STEEL REINFORCEMENT LINKS AND SHALL HAVE A BULL NOSE FINISH AROUND ITS EXTERNAL PERIMETER. SEE SECTION 3.18 OF WATER CODE OF PRACTICE.

NOTE: THRUST BLOCKS TO BE PROVIDED AT EACH BEND ALONG THE COURSE OF THE WATERMAIN IN COMPLIANCE WITH SECTION 4.6 OF IRISH WATER, 'WATER SUPPLY INFRASTRUCTURE CODE OF PRACTICE'

NOTE: ENSURE DEPTH OF COVER TO WATERMAIN CROWN IS ACHIEVED IN COMPLIANCE WITH SECTION 3.11 OF IRISH WATER, 'WATER SUPPLY INFRASTRUCTURE CODE OF PRACTICE'

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1-353 1 864 8900

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 2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT ARCHITECTURAL AND ENGINEERING DRAWINGS.
 3. REFER TO THE SPECIALIST DRAWINGS (ENFONIC) FOR DETAILS OF THE BERM AND SOUND BARRIER PROPOSALS.

P2	04/04/25	REVISED PLANNING - UISE EIREANN RE-SUBMISSION	NF	EC
P1	03/04/25	LRD STAGE 3 PLANNING SUBMISSION	GB	EC

Amendments

Project

WOODTOWN, BALLYCULLEN

Title

PROPOSED WATERMAIN LAYOUT
SHEET 1 OF 2

Client

LAGAN HOMES BALLYCULLEN LIMITED

waterman moylan

BLOCK 5, EASTPOINT BUSINESS PARK, ALFIE BYRNE ROAD,
DUBLIN D03 H3F4 IRELAND. Tel: (01) 864 8900
Email: info@waterman-moylan.ie www.waterman-moylan.ie

Status

PLANNING

Designed By EC Approved JG Waterman Ref 24-007

Drawn By GB Date APRIL 2025 Scales @ A1 1:500 @ A1

Project - Originator - Volume - Level - Type - Role - Number Revision

BYCN- WM - 00 - XX-DR- C -P1300 P2



SHEET 2

SHEET 1

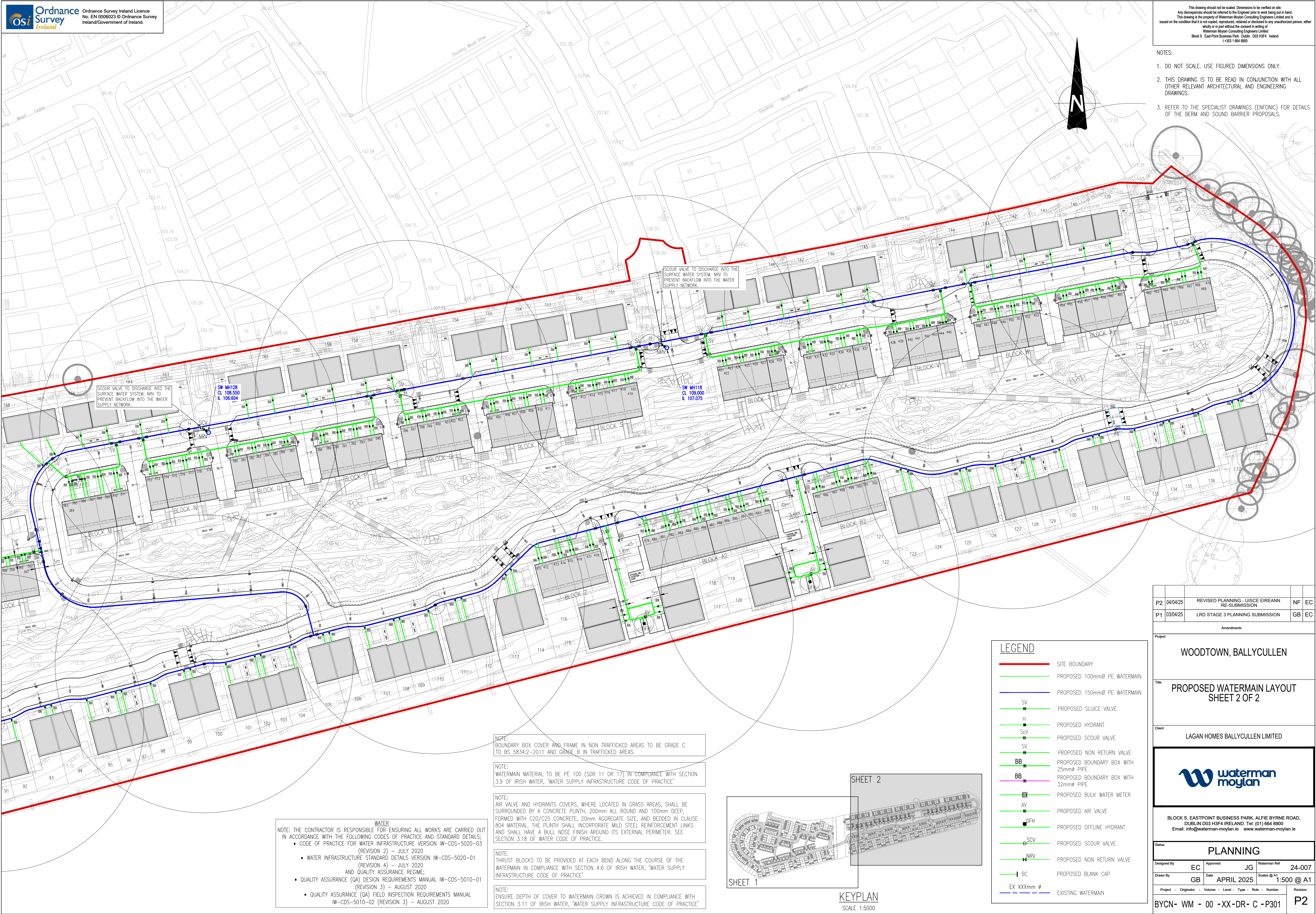
KEYPLAN
SCALE 1:5000

LEGEND

- SITE BOUNDARY
- PROPOSED 100mmØ PE WATERMAIN
- PROPOSED 150mmØ PE WATERMAIN
- SV PROPOSED SLUICE VALVE
- H PROPOSED HYDRANT
- ScV PROPOSED SCOUR VALVE
- SV PROPOSED NON RETURN VALVE
- BB PROPOSED BOUNDARY BOX WITH 25mmØ PIPE
- BB PROPOSED BOUNDARY BOX WITH 32mmØ PIPE
- BM PROPOSED BULK WATER METER
- AV PROPOSED AIR VALVE
- OFH PROPOSED OFFLINE HYDRANT
- SCV PROPOSED SCOUR VALVE
- NRV PROPOSED NON RETURN VALVE
- BC PROPOSED BLANK CAP
- EX XXXmm Ø EXISTING WATERMAIN

NOTES:

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- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT ARCHITECTURAL AND ENGINEERING DRAWINGS.
- REFER TO THE SPECIALIST DRAWINGS (ENFONIC) FOR DETAILS OF THE BERM AND SOUND BARRIER PROPOSALS.



NOTE:
BOUNDARY BOX COVER AND FRAME IN NON TRAFFICKED AREAS TO BE GRADE C
TO BS 5834:2-2011 AND GRADE B IN TRAFFICKED AREAS.

NOTE:
WATERMAIN MATERIAL TO BE PE 100 (SDR 11 OR 17) IN COMPLIANCE WITH SECTION
3.9 OF IRISH WATER, 'WATER SUPPLY INFRASTRUCTURE CODE OF PRACTICE'

NOTE:
AIR VALVE AND HYDRANTS COVERS, WHERE LOCATED IN GRASS AREAS, SHALL BE
SURROUNDED BY A CONCRETE PLINTH, 200mm ALL ROUND AND 100mm DEEP,
FORMED WITH C20/C25 CONCRETE, 20mm AGGREGATE SIZE, AND BEDDED IN CLAUSE
804 MATERIAL. THE PLINTH SHALL INCORPORATE MILD STEEL REINFORCEMENT LINKS
AND SHALL HAVE A BULL NOSE FINISH AROUND ITS EXTERNAL PERIMETER. SEE
SECTION 3.18 OF WATER CODE OF PRACTICE.

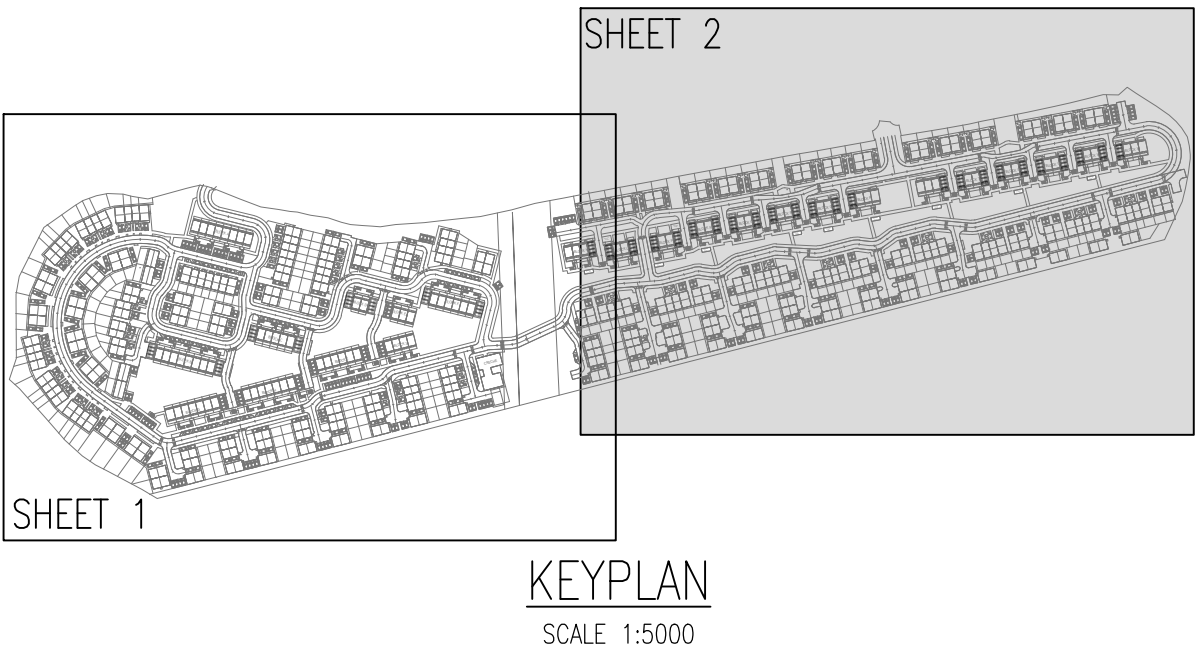
NOTE:
THRUST BLOCKS TO BE PROVIDED AT EACH BEND ALONG THE COURSE OF THE
WATERMAIN IN COMPLIANCE WITH SECTION 4.6 OF IRISH WATER, 'WATER SUPPLY
INFRASTRUCTURE CODE OF PRACTICE'

NOTE:
ENSURE DEPTH OF COVER TO WATERMAIN CROWN IS ACHIEVED IN COMPLIANCE WITH
SECTION 3.11 OF IRISH WATER, 'WATER SUPPLY INFRASTRUCTURE CODE OF PRACTICE'

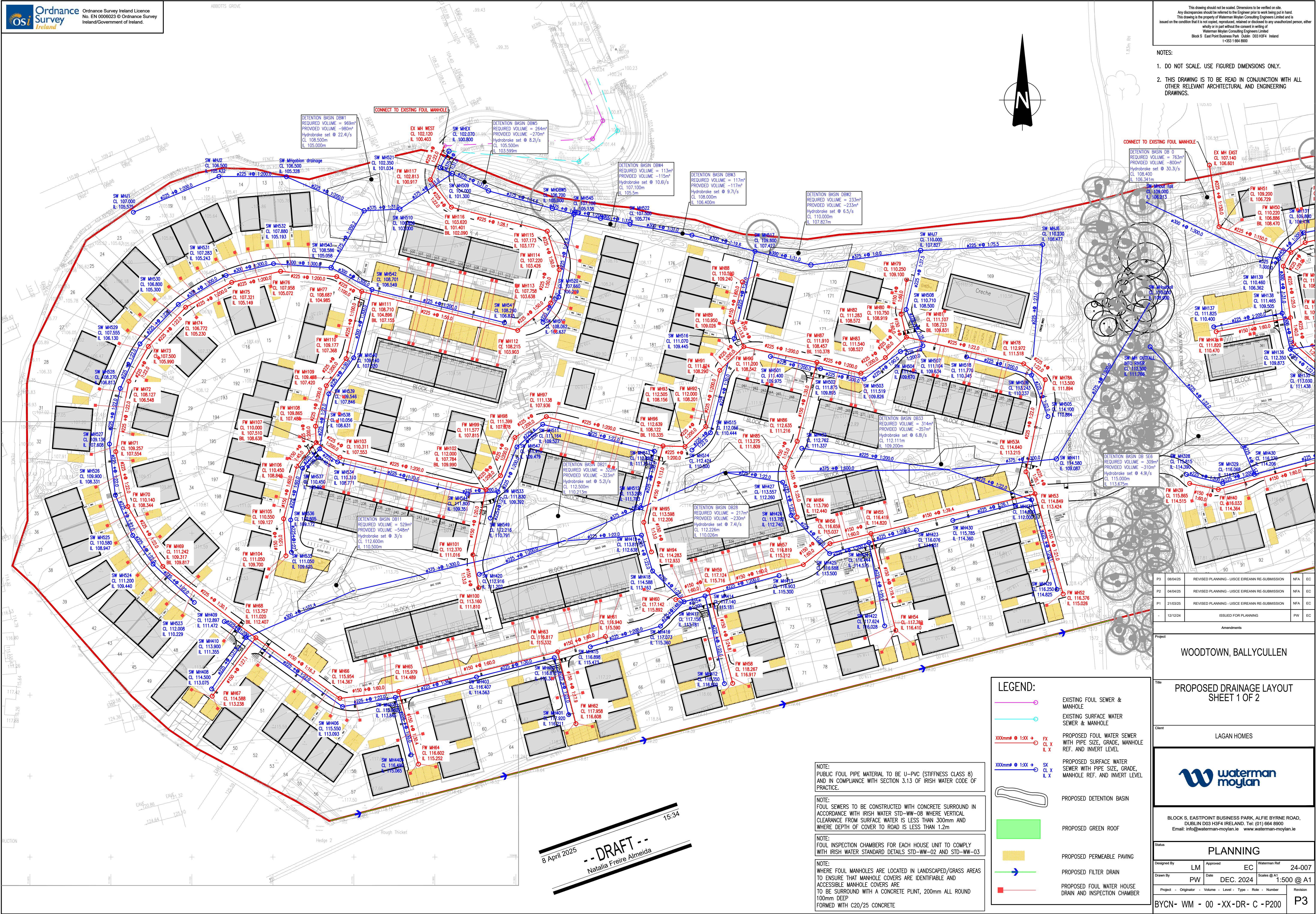
WATER
NOTE: THE CONTRACTOR IS RESPONSIBLE FOR ENSURING ALL WORKS ARE CARRIED OUT
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(REVISION 2) - JULY 2020
• WATER INFRASTRUCTURE STANDARD DETAILS VERSION IW-CDS-5020-01
(REVISION 4) - JULY 2020
AND QUALITY ASSURANCE REGIME;
• QUALITY ASSURANCE (QA) DESIGN REQUIREMENTS MANUAL IW-CDS-5010-01
(REVISION 3) - AUGUST 2020
• QUALITY ASSURANCE (QA) FIELD INSPECTION REQUIREMENTS MANUAL
IW-CDS-5010-02 (REVISION 3) - AUGUST 2020

LEGEND

- SITE BOUNDARY
- PROPOSED 100mm PE WATERMAIN
- PROPOSED 150mm PE WATERMAIN
- SV PROPOSED SLUCE VALVE
- H PROPOSED HYDRANT
- ScV PROPOSED SCOUR VALVE
- SV PROPOSED NON RETURN VALVE
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- EX XXXmm Ø EXISTING WATERMAIN



P2	04/04/25	REVISED PLANNING - UISE EIREANN RE-SUBMISSION	NF	EC
P1	03/04/25	LRD STAGE 3 PLANNING SUBMISSION	GB	EC
Amendments				
Project				
WOODTOWN, BALLYCULLEN				
Title				
PROPOSED WATERMAIN LAYOUT SHEET 2 OF 2				
Client				
LAGAN HOMES BALLYCULLEN LIMITED				
Status				
PLANNING				
Designed By	EC	Approved	JG	Waterman Ref
Drawn By	GB	Date	APRIL 2025	24-007
Scales @ A1				1:500 @ A1
Project	Originator	Volume	Level	Type
BYCN- WM - 00 - XX-DR- C -P301				
Revision				P2



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Rev	Date	Description	By	EC
P3	08/04/25	REVISED PLANNING - USICE EIREANN RE-SUBMISSION	NFA	EC
P2	04/04/25	REVISED PLANNING - USICE EIREANN RE-SUBMISSION	NFA	EC
P1	21/03/25	REVISED PLANNING - USICE EIREANN RE-SUBMISSION	NFA	EC
-	12/12/24	ISSUE FOR PLANNING	PW	EC

WOODTOWN, BALLYCULLEN

PROPOSED DRAINAGE LAYOUT
SHEET 1 OF 2

Client: LAGAN HOMES

waterman moylan

BLOCK 5, EASTPOINT BUSINESS PARK, ALFIE BYRNE ROAD,
DUBLIN D03 H3F4 IRELAND. Tel: (01) 864 8900
Email: info@waterman-moylan.ie www.waterman-moylan.ie

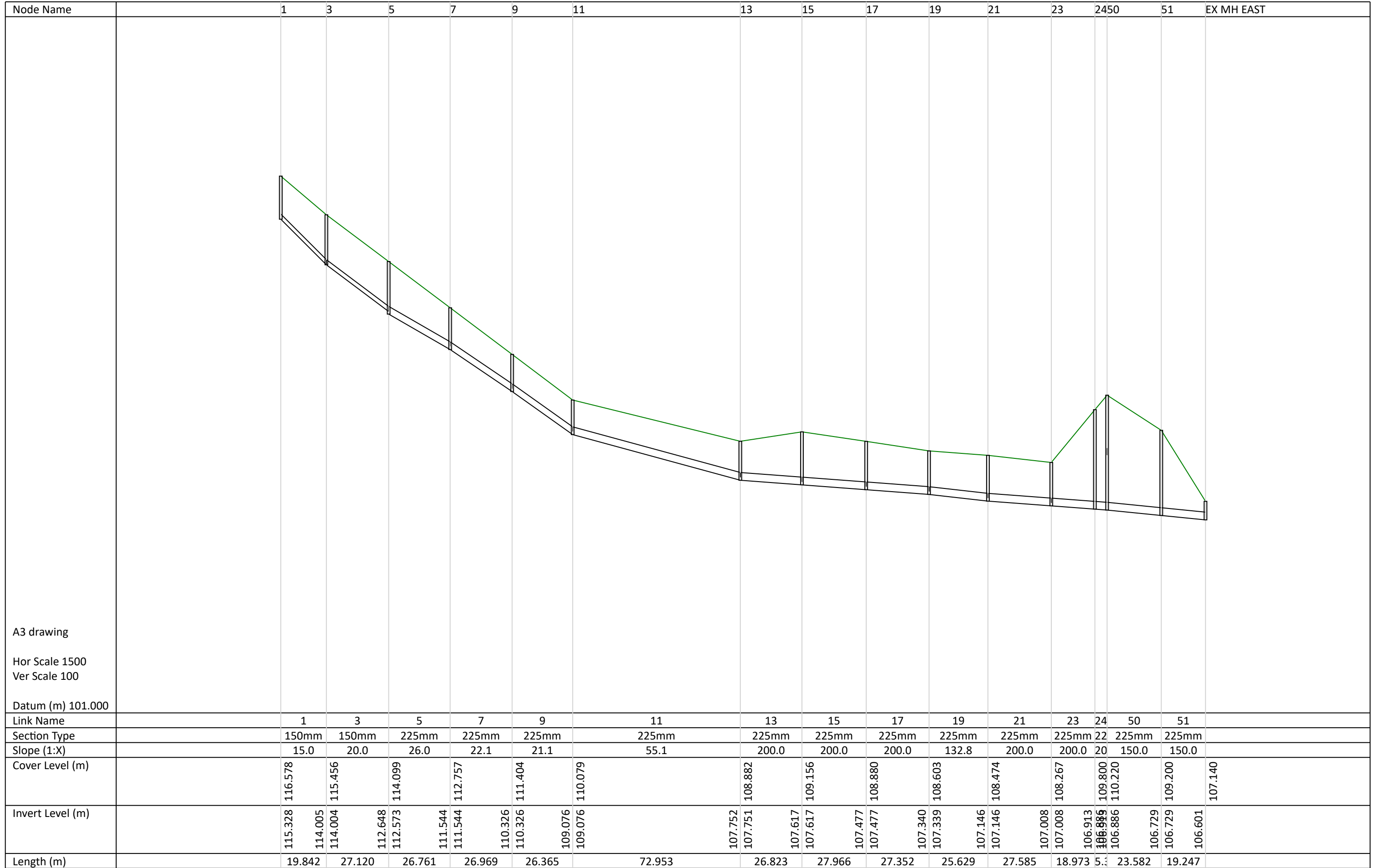
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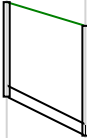
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Drawn By	PW	Date	DEC. 2024	Scales @ A1	1:500 @ A1		
Project	Originator	Volume	Level	Type	Role	Number	Revision

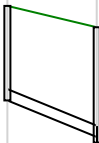
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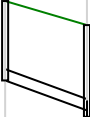
P3

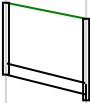
8 April 2025
-- DRAFT --
Natalia Freire Almeida

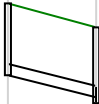


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	Length (m)			15.624

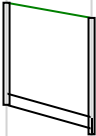
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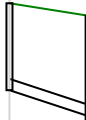
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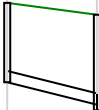
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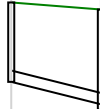
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			Section Type	
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			Invert Level (m)	
			Length (m)	

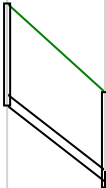
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			12	
			150mm	
			60.0	
			109.050	108.882
			108.100	107.826
			16.420	
Link Name			12	
Section Type			150mm	
Slope (1:X)			60.0	
Cover Level (m)			109.050	108.882
Invert Level (m)			108.100	107.826
Length (m)			16.420	

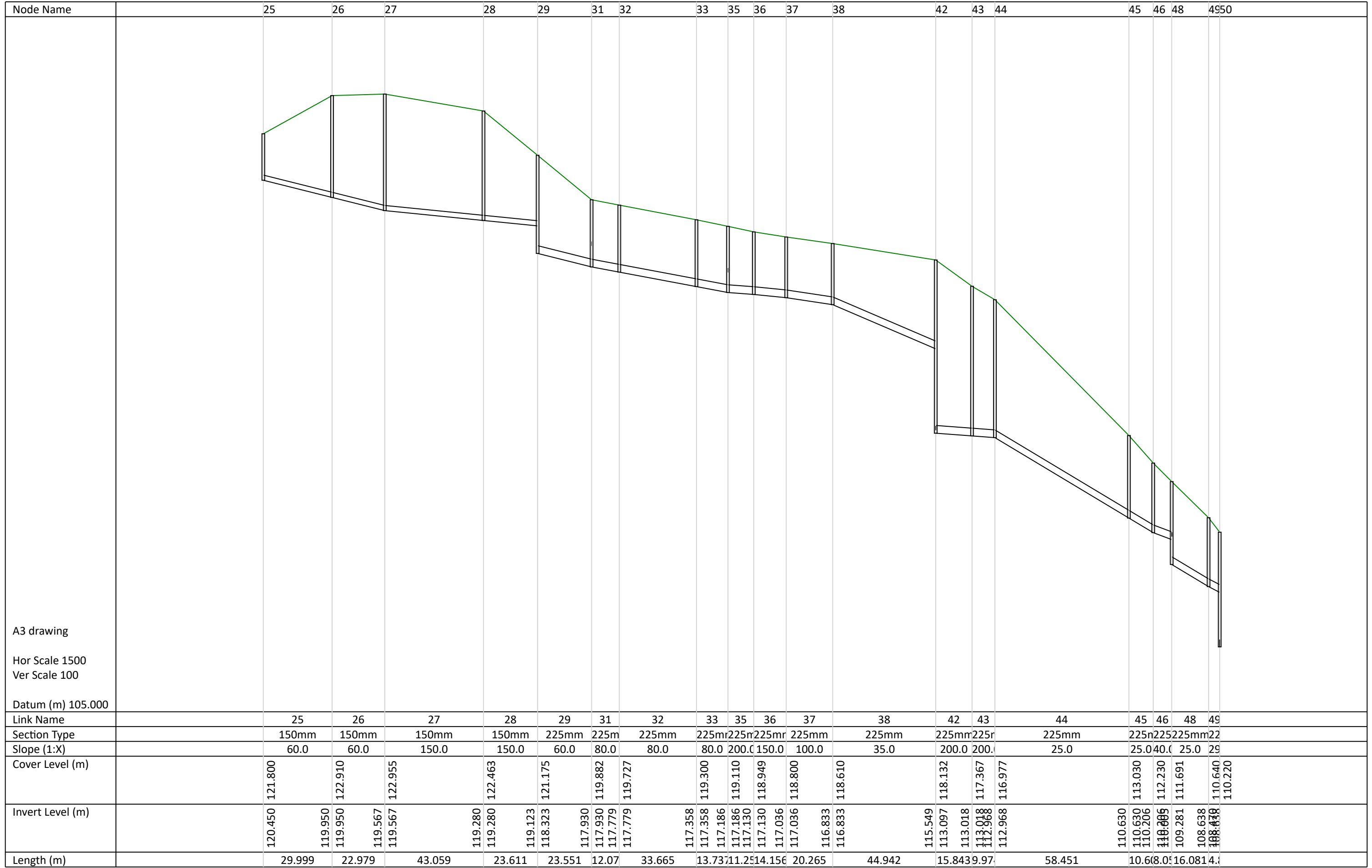
Node Name			14	15
A3 drawing Hor Scale 1500 Ver Scale 100 Datum (m) 98.000				
	Link Name		14	
	Section Type		150mm	
	Slope (1:X)		53.6	
	Cover Level (m)		109.357	109.156
	Invert Level (m)		108.007 107.692	
	Length (m)		16.872	

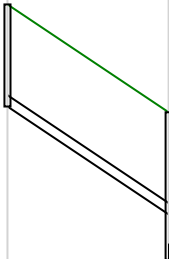
Causeway		Waterman Moylan Consulting		File: 24-007 FW and SW - East Catchment.pfd Network: FW - EAST Natalia Freire Almeida 08/04/2025		Page 9	
Node Name				16	17		
A3 drawing Hor Scale 1500 Ver Scale 100 Datum (m) 98.000							
				Link Name			
				Section Type		150mm	
				Slope (1:X)		45.7	
				Cover Level (m)			
Invert Level (m)				109.046 107.896	108.880 107.552		
Length (m)				15.710			
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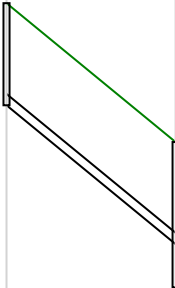
Node Name	18	19
A3 drawing Hor Scale 1500 Ver Scale 100 Datum (m) 98.000		
Link Name	18	
Section Type	150mm	
Slope (1:X)	60.0	
Cover Level (m)	108.760 108.603	108.603
Invert Level (m)	107.710 107.414	
Length (m)	17.788	

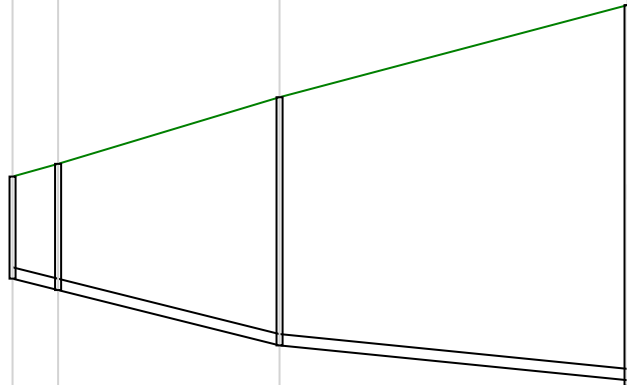
Node Name			20	21
A3 drawing Hor Scale 1500 Ver Scale 100 Datum (m) 98.000				
			Link Name	
			Section Type	
			Slope (1:X)	
			Cover Level (m)	
			Invert Level (m)	
			Length (m)	
			20	
			150mm	
			60.0	
			108.567	108.474
			107.517	107.221
			17.782	

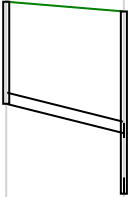
Node Name	2223	
A3 drawing Hor Scale 1500 Ver Scale 100 Datum (m) 98.000		
	Link Name	22
	Section Type	150mm
	Slope (1:X)	19.3
	Cover Level (m)	109.440108.267
	Invert Level (m)	108.090107.084
	Length (m)	19.418

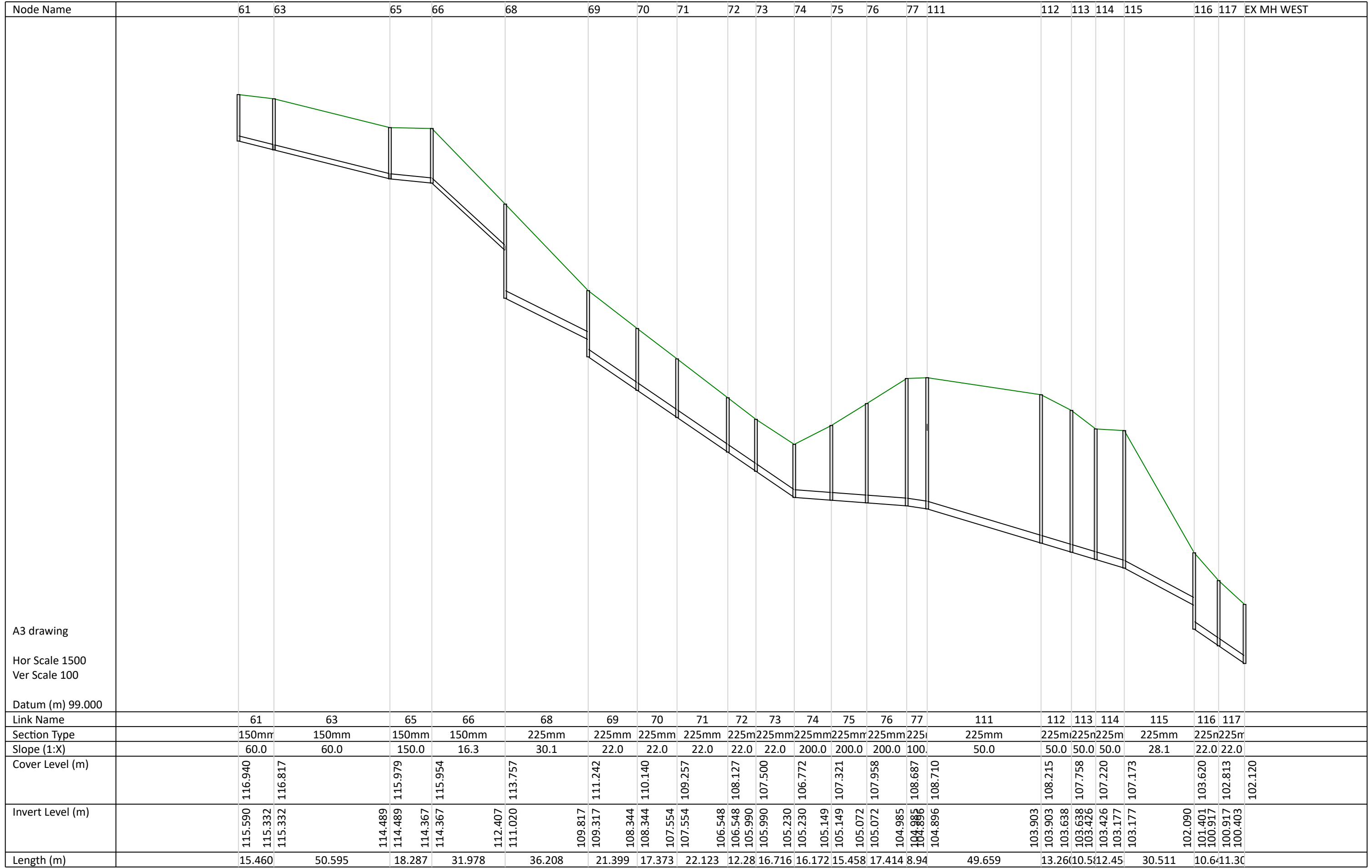


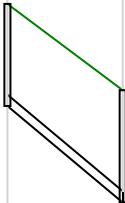
Node Name	3031	
A3 drawing Hor Scale 1500 Ver Scale 100 Datum (m) 110.000		
	Link Name	30
	Section Type	150mm
	Slope (1:X)	22.4
	Cover Level (m)	121.308119.882
	Invert Level (m)	119.958118.532
	Length (m)	31.976

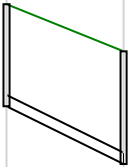
Node Name	34	35
A3 drawing Hor Scale 1500 Ver Scale 100 Datum (m) 109.000		
Link Name	34	
Section Type	150mm	
Slope (1:X)	18.3	
Cover Level (m)	120.946	119.110
Invert Level (m)	119.596	117.760
Length (m)	33.547	

Node Name	39		40	41		42
A3 drawing Hor Scale 1500 Ver Scale 100 Datum (m) 106.000						
	Link Name		39	40	41	
	Section Type		150mm	150mm	150mm	
	Slope (1:X)		60.0	60.0	150.0	
	Cover Level (m)		115.865	116.033	116.914	118.132
Invert Level (m)	114.515		114.364	113.632	113.632	113.172
Length (m)	9.04		43.941	69.051		

Node Name	47	48
A3 drawing Hor Scale 1500 Ver Scale 100 Datum (m) 100.000		
Link Name	47	
Section Type	150mm	
Slope (1:X)	60.0	
Cover Level (m)	111.820	111.691
Invert Level (m)	110.470	110.081
Length (m)	23.343	



Node Name	6263	
A3 drawing Hor Scale 1500 Ver Scale 100 Datum (m) 107.000		
	Link Name	62
	Section Type	150mm
	Slope (1:X)	17.9
	Cover Level (m)	117.958116.817
	Invert Level (m)	116.608115.332
	Length (m)	22.870

Node Name	64	65
A3 drawing Hor Scale 1500 Ver Scale 100 Datum (m) 105.000		
Link Name	64	
Section Type	150mm	
Slope (1:X)	30.4	
Cover Level (m)	116.602	115.979
Invert Level (m)	115.252 114.489	
Length (m)	23.230	

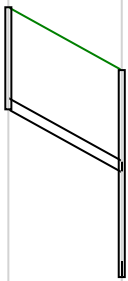


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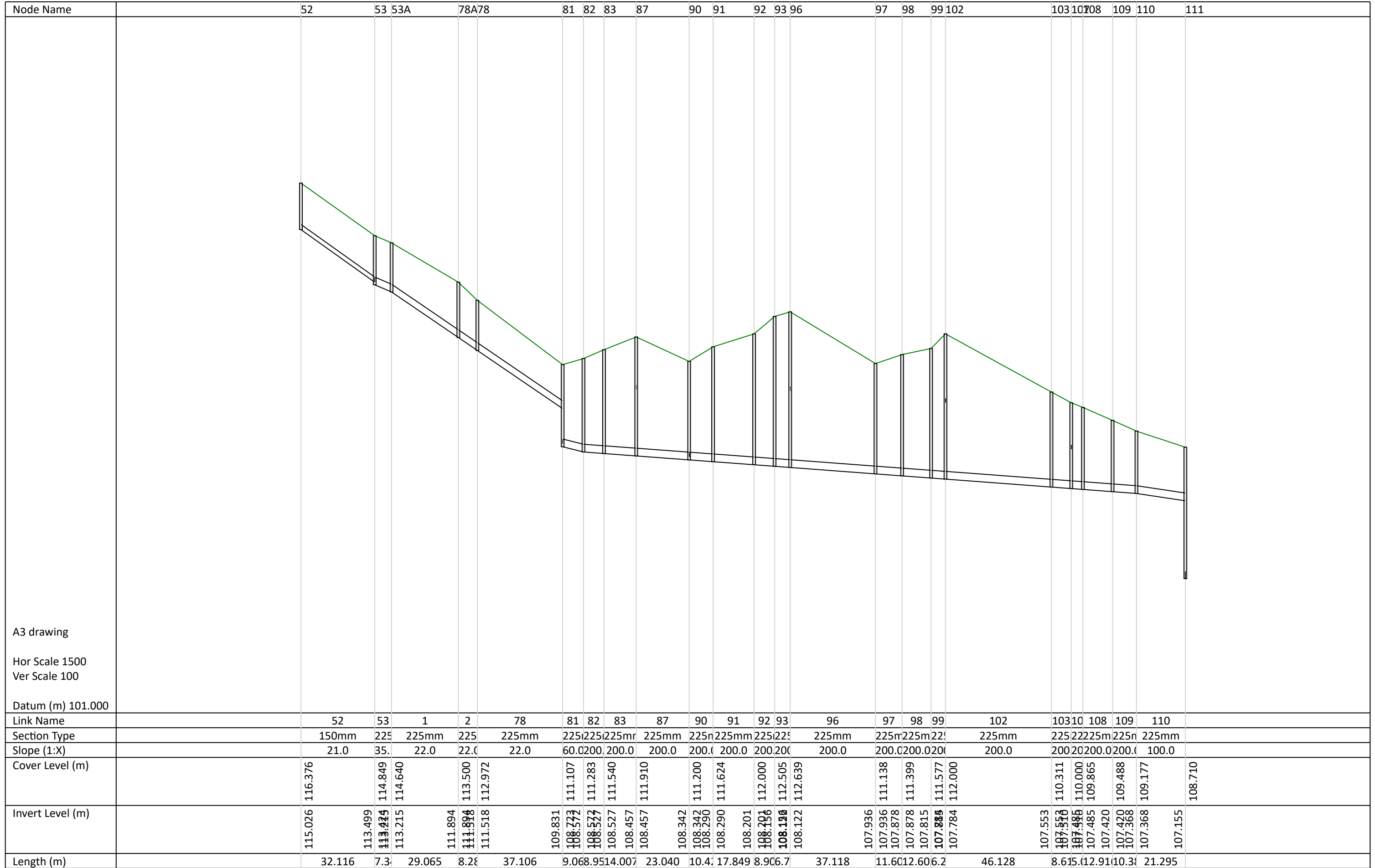
Waterman Moylan Consulting

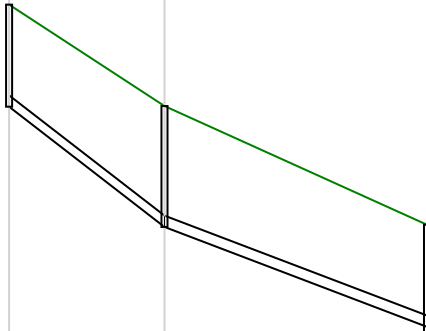
File: south west SW+FW.pfd
Network: Foul West
Natalia Freire Almeida
08/04/2025

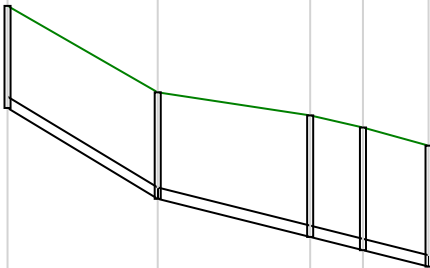
Page 4

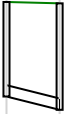
Node Name	67	68
A3 drawing Hor Scale 1500 Ver Scale 100 Datum (m) 103.000		
Link Name	67	
Section Type	150mm	
Slope (1:X)	27.1	
Cover Level (m)	114.588	113.757
Invert Level (m)	113.238	112.407
Length (m)	22.504	

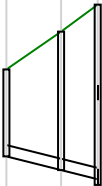
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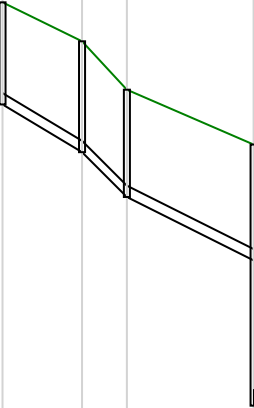


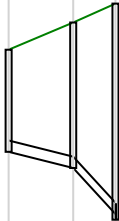
Node Name	54		55	53	
A3 drawing Hor Scale 1500 Ver Scale 100 Datum (m) 105.000					
	Link Name		54	55	
	Section Type		150mm	150mm	
	Slope (1:X)		19.4	39.4	
	Cover Level (m)		117.760	116.419	114.849
Invert Level (m)		116.410 114.820	114.820	113.499	
Length (m)		30.835	52.089		

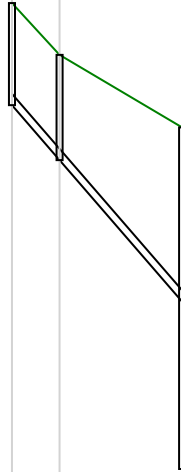
Node Name	58	59	57	56	55
A3 drawing Hor Scale 1500 Ver Scale 100 Datum (m) 106.000					
Link Name	58	59	57	56	
Section Type	150mm	150mm	150mm	150mm	
Slope (1:X)	24.8	60.0	60.0	60.0	
Cover Level (m)	118.267	117.124	116.819	116.659	116.419
Invert Level (m)	116.917	115.716	115.212	115.037	114.820
Length (m)	29.801	30.248	10.413	13.016	

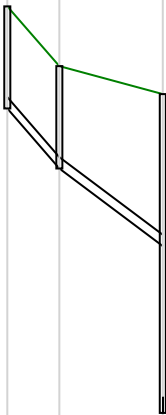
Node Name	60 59	
A3 drawing Hor Scale 1500 Ver Scale 100 Datum (m) 106.000		
	Link Name	60
	Section Type	150n
	Slope (1:X)	60.0
	Cover Level (m)	117.142 117.124
	Invert Level (m)	115.892 115.716
	Length (m)	10.54

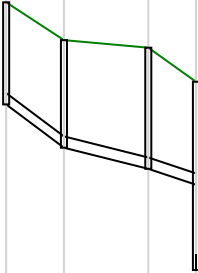
Node Name	798081		
A3 drawing Hor Scale 1500 Ver Scale 100 Datum (m) 100.000			
	Link Name	79	80
	Section Type	150m	150m
	Slope (1:X)	60.0	60.0
	Cover Level (m)	110.250 109.100 108.919	110.750 108.998 108.998
	Invert Level (m)	111.107	
Length (m)	10.857.2		

Node Name	84	85	86	87
A3 drawing Hor Scale 1500 Ver Scale 100 Datum (m) 101.000				
Link Name	84	85	86	
Section Type	150mm	150mm	150mm	
Slope (1:X)	25.0	15.0	30.0	
Cover Level (m)	113.790	113.275	112.635	111.910
Invert Level (m)	112.440	111.809	111.808	110.378
Length (m)	15.781	8.89	25.138	

Node Name	888990		
A3 drawing Hor Scale 1500 Ver Scale 100 Datum (m) 100.000			
	Link Name	88	89
	Section Type	150m	150
	Slope (1:X)	60.0	13.8
	Cover Level (m)	110.590 109.240	110.950 108.419
Invert Level (m)	111.200		
Length (m)	12.818.38		

Node Name	94	95	96
A3 drawing Hor Scale 1500 Ver Scale 100 Datum (m) 101.000			
Link Name	94	95	
Section Type	150r	150mm	
Slope (1:X)	13.0	13.0	
Cover Level (m)	114.283	113.598	112.639
Invert Level (m)	112.933	112.206	110.335
Length (m)	9.44	24.317	

Node Name	100	101	102
A3 drawing Hor Scale 1500 Ver Scale 100 Datum (m) 100.000			
Link Name	100	101	
Section Type	150n	150mm	
Slope (1:X)	13.0	20.0	
Cover Level (m)	113.160	112.370	112.000
Invert Level (m)	111.810 111.016	111.016 109.990	
Length (m)	10.3	20.525	

Node Name	104	105	106	107
A3 drawing Hor Scale 1500 Ver Scale 100 Datum (m) 99.000				
Link Name	104	105	106	
Section Type	150mm	150mm	150mm	
Slope (1:X)	20.0	60.0	45.0	
Cover Level (m)	111.050	110.550	110.450	110.000
Invert Level (m)	109.700 109.127	109.127 108.848	108.848 108.638	
Length (m)	11.46	16.736	9.45	

UK and Ireland Office Locations

