

deposits. Wardell Armstrong concluded that the published geological information was inaccurate. Reference to local shaft sections and their ground investigation data led them to conclude that *'The Arley seam does not pose any potential problem to the surface stability of the site because of its depth, limited extent and proximity to the faulted zone'* and *'the position with regard to shallow mining has been properly investigated and no further regard need now be given to potential problems of shallow mining of the site'*.

4.2 Ground Investigation Data

4.2.1 Engineered Fill

The majority of the Unit 3 Site is underlain by a cover of engineered fill that increases in thickness towards the River Roch. The engineered fill ranged in thickness from 100 mm in trial pit TP209 to 3.7 m in borehole BH107B and was absent along the eastern edge of the site.

The engineered fill typically consisted of compact and interlayered brown and grey firm to stiff sandy clay and slightly clayey slightly silty very sandy gravel with much gravel to cobble size and occasionally boulder sized fragments of concrete, sandstone, brick, road scalpings, and traces of plastic, metal and wood. The fill had been compacted in layers estimated to be 250 to 350 mm thick, contained no void spaces and became difficult to excavate at depth due to the density of the material and the presence of boulder size obstructions.

4.2.2 Glacial Till

Heterogeneous Glacial Till deposits were revealed in all the exploratory holes that penetrated the engineered fill. The Glacial Till can be subdivided into deposits of Boulder Clay and Glacial Sand and Gravel. However, the deposits have been classified as Glacial Till on all the exploratory hole logs.

Along the eastern edge of the site where the fill was absent, a 600 mm to 1.20 m thick superficial layer of stiff Boulder Clay was encountered. The Boulder Clay comprised stiff slightly fissured friable mottled grey brown, orange brown and grey silty gravelly very sandy clay/silt.

The upper layer of Boulder Clay was absent in exploratory holes BH102, BH105, BH106, TP204 and TP209, where the fill rested directly upon very loose to loose Glacial Sand and Gravel. The Glacial Sand and Gravel consisted of light grey brown slightly silty fine medium sand of occasional fine to medium coal gravel and thin laminations of coal sand. The Glacial Sand and Gravel was not fully penetrated by any of the trial pits due to its tendency to collapse when groundwater was struck. The thickness of the Glacial Sand and Gravel varied between 400 mm in borehole BH104 to 3.1 m in borehole BH105 and was not encountered in boreholes BH102 and BH107B.

The majority of the Glacial Till comprised firm mottled red brown and grey brown sandy very silty clay very thinly interbedded with loose red brown clayey very silty fine to medium sand. These interbedded clays and sands increased in thickness from south (4.5 m in BH106) to north (7.9 m in BH101). The base of these interbedded soils increased in depth from 9.0 m (79.6 m AOD) in borehole BH106 to 11.4 m (78.5 m AOD) in borehole BH101.

The basal layer of the Glacial Till comprised stiff to very stiff closely fissured dark grey brown sandy silty clay with some rounded becoming more angular with depth fine to coarse gravel size weak fragments of siltstone, sandstone and mudstone. The basal layer of Boulder Clay rested upon the rockhead and increased in thickness from 1.4 m in borehole BH106 to 2.3 m in borehole BH102.

4.2.3 Lower Coal Measures

The Lower Coal Measures were encountered at the base of all the boreholes at depths ranging between 10.4 m (78.2 m AOD) in borehole BH106 to 13.3 m (75.5 m AOD) in borehole BH102. The rockhead apparently increased in depth from south to north, as shown on the schematic cross section presented on drawing number 8951/3.

The Lower Coal Measures comprised red brown fine-medium grained weak sandstone, recovered as angular gravel size sandstone fragments in a matrix of firm red brown sandy clay. Maximum thicknesses of 200 mm of Lower Coal Measures were proved in the boreholes.

4.2.4 Groundwater

Seepages of groundwater were recorded within the Glacial Till deposits in all of the boreholes and those trial pits excavated down the eastern side of the site.

No seepages were recorded within the engineered fill.

The hydraulic gradient beneath the site appears to flow from the north east corner towards the south west and the River Roch beyond.

Table 4.2.4 Groundwater Records

Exploratory Hole	Depth to Groundwater (m)	Groundwater Level (m AOD)	Remarks
BH101	2.28	87.62	Monitored in standpipe
BH102	0.91	87.89	Monitored in standpipe
BH103	1.90	87.20	Monitored in standpipe
BH104A	3.53	85.07	Monitored in standpipe
BH105	2.54	86.16	Monitored in standpipe
BH106	1.78	86.82	Monitored in standpipe
BH107B	4.10	84.5	Monitored in standpipe
TP201	1.70	88.8	Completion level
TP202	1.60	87.3	Completion level
TP203	1.45	87.25	Completion level
TP204	2.40	86.2	Completion level
TP210	1.80	87.8	Completion level

7. CONCLUSIONS

The investigation showed the site to be underlain by a wedge shaped layer of Engineered Fill up to 3.7 m thick resting upon heterogeneous Glacial Till deposits. The Lower Coal Measures rockhead was proved at depths between 10.4 and 13.3 m.

Groundwater was encountered between depths of 1.45 and 4.10 m in the Glacial Till Deposits.

The warehouse structure may be supported upon spread foundations bearing upon the Glacial Till and the Engineered Fill. A full discussion is presented in section 5.2.

A ground bearing floor slab may be adopted. Estimates of floor settlement are given in section 5.3.

Retaining wall design parameters are presented in section 5.4.

A preliminary CBR value of 5% is recommended for the design of external paved areas.

Elevated concentrations of hazardous ground gases were recorded in the borehole installations requiring short-term and long-term ground gas precautions to be taken, details of which are given in sections 6.7.2 and 6.7.3.

Groundworkers will be required to take standard health and safety precautions in order to minimise contact with the made ground, as discussed in section 6.7.3.

The Design Sulphate Class for the site is DS-2. The ACEC Class is AC-4z.

Consideration should be given to the type of drinking water supply piping used, due to the presence of hydrocarbons in the made ground.

The Environment Agency should be informed that some materials have been placed on the site which fall outside the waste disposal licence, especially the presence of TPH and PAH in the soil and groundwater samples.

This report is based on the results of the desk study, the fieldwork and laboratory testing carried out and on an examination of the recovered samples. The possibility that different conditions may exist other than at the exploratory hole positions, or at greater depth, should not be ruled out. In particular, groundwater records apply only to the time and place of investigation, since wide variations may occur through seasonal or other causes.

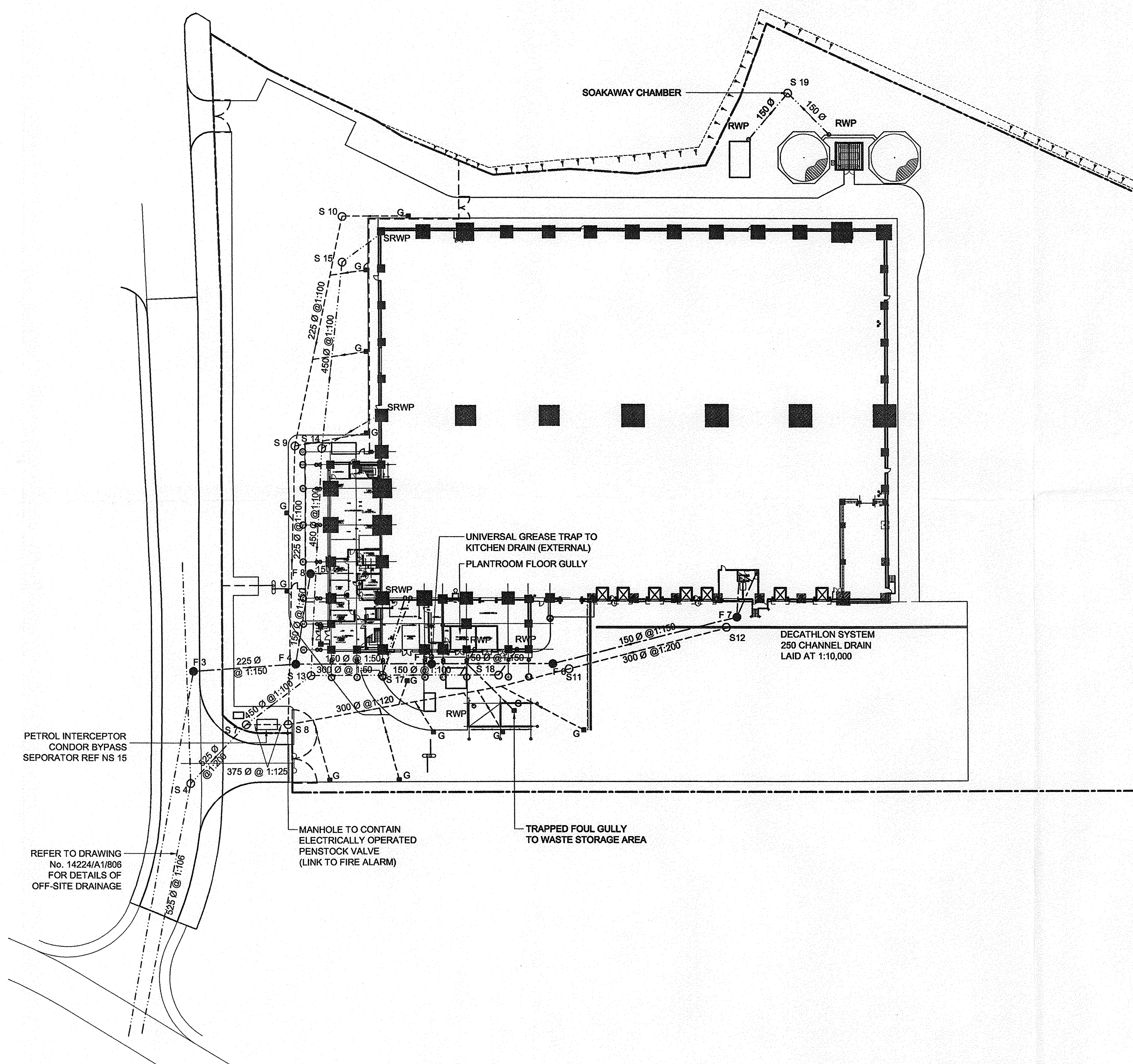
Samples from the investigation will be retained for a period of four weeks from the date of this report, unless instructions to the contrary are received.

ANNEX 4

Drainage Record Drawings

- key :**

	-	SURFACE WATER DRAIN
	-	SURFACE WATER ROOF DRAIN
	-	FOUL WATER DRAIN
	-	SURFACE WATER MANHOLE
	-	FOUL WATER MANHOLE
	-	LAND DRAIN MANHOLE
	-	CATCHPIT MANHOLE
	-	GULLY
	-	RAINWATER PIPE
	-	RODDING EYE
	-	SOIL VENT PIPE
	-	COVER LEVEL
	-	SOFFIT LEVEL
	-	INVERT LEVEL
	-	BACK DROP
	-	SIPHONIC RAINWATER PIPE



MANHOLE SCHEDULE							
MANHOLE	COVER LEVEL (m)	INVERT LEVEL (m)	DEPTH (m)	TYPE	CHAMBER DIAMETER (mm)	COVER TYPE	COMMENTS
S 4	88.518	86.145	2.373	B	1500	D400	
S 7	89.150	86.225 (5250 OUT) 86.790 (4500 IN)	2.925	B	1200	B125	
S 8	89.250	86.515 (3750 OUT) 87.110 (2250 IN)	2.735	B	1350	B125	PENSTOCK CHAMBER
S 9	89.500	87.650	1.850	B	1200	B125	
S 10	89.100	88.100	1.000	B	1200	C250	
S 11	88.800	87.040	1.760	B	1200	D400	
S 12	87.950	87.200	0.750	B	1200	D400	
S 13	89.100	86.940 (4500 OUT) 87.237 (3000 IN)	1.600	B	1350	C250	
S 14	89.350	87.380	1.970	B	1350	C125	
S 15	89.100	87.750	1.350	B	1350	C250	VENTED COVER
S 16	DELETED	DELETED	DELETED	DELETED	DELETED	DELETED	DELETED
S 17	89.100	87.520	1.580	E	1200	B125	VENTED COVER
S 18	88.900	87.900	1.000	B	1200	D400	VENTED COVER
S 19	88.400	87.200 MIN	1.200MIN	N/A	2400	B125	SOAKAWAY CHAMBER
F 3	88.955	86.302	2.653	B	1200	D400	
F 4	89.100	86.510	2.590	B	1200	C250	
F 5	89.100	86.690	2.410	B	1200	B125	
F 6	88.800	86.850	1.950	B	1200	D400	
F 7	88.000	87.100	0.900	B	1200	D400	
F 8	89.250	86.630	2.620	B	1200	B125	

NOTE:
INVERT LEVELS GIVEN
ARE FOR THE LOWEST
PIPE IN MANHOLES

D	Status Amended	GB	17.11.2007
C	Status amended Drainage layout revised to contractors comments. Manhole schedule updated.	GB	29.03.2008
B	1. Positions of Smoker's Shelter, Gas Meter House and Generator House amended	GD	18.12.2007
A	Drainage layout and levels revised in loading dock area	GB	02.12.2007
rev	amendments	by	date

• burksgreen

Burks Green
Sherwood House,
Sherwood Avenue,
Newark, Nottinghamshire,
NG24 1QQ

T +44 (0) 1636 605 707
F +44 (0) 1636 610 698
W www.burksgreen.co.uk
E mail@burksgreen.co.uk

Client



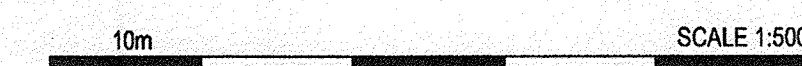
Project:

Roach Bank Farm

Title: **Co-ordinated Drainage Layout**

Drawing Status: Final Issue	Date Created: 14.10.2003	Drawing Scale: 1:500
Drawing Number: 14224 /A1 / 310		Rev: D
Project Leader: DD	Drawn By: DW	Initial Review: GB

FINAL ISSUE



notes :

1. IF THIS DRAWING HAS BEEN RECEIVED ELECTRONICALLY IT IS THE RECIPIENTS RESPONSIBILITY TO PRINT THE DOCUMENT TO THE CORRECT SCALE
2. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS STATED OTHERWISE IT IS RECOMMENDED THAT INFORMATION IS NOT SCALED OFF THIS DRAWING
3. THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT DRAWINGS AND SPECIFICATIONS

MANHOLE SCHEDULE							
MANHOLE	COVER LEVEL (m)	INVERT LEVEL (m)	DEPTH (m)	TYPE	CHAMBER DIAMETER (mm)	COVER TYPE	COMMENTS
S 2	86.700	84.679	2.021	B	1800	B125	
S 3	87.554	84.795	2.759	B	1500	D400	
F 1A	86.700	83.240	3.460	A	1200	B125	
F 1	86.700	83.740	2.960	B	1200	B125	
F 2	87.489	84.000	3.489	A	1200	D400	

NOTE:
INVERT LEVELS GIVEN
ARE FOR THE LOWEST
PIPE IN MANHOLES

KEY - DRAINAGE

- FOUL WATER DRAINAGE
- HIGHWAY DRAINAGE
- SURFACE WATER DRAINAGE

H	Status Amended	GB	17.11.2004
G	Drainage System Revised from MH S2 to River outfall Manhole S2 levels and pipe diameter revised	GB	01.10.2004
F	Surface water drainage route revised between MH S1 to S3.	GB	09.09.2004
E	Drainage layout revised.	GB	23.04.2004
D	Status amended. Manhole schedule added. Outfall head-wall detail deleted. Foul drainage levels revised.	GB	29.03.04
C	Section A-A added.	GB	30.12.2003
B	Outfall detail added. Drainage revised to Bury MBC comments.	GB	25.11.2003
A	F4 - F3, F3 - F2 & S5 - S4 amended. Unit 4 Spurs added.	DJW	21.10.2003

rev	amendments	by	date
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burksgreen

Burks Green
Sherwood House,
Newark, Nottinghamshire,
NG24 1QQ

T +44 (0) 1636 605 700
F +44 (0) 1636 610 696
W www.burksgreen.com
E mail@burksgreen.com

Client:



Project:

Roach Bank Farm

Title:

Overall Site Drainage

Drawing Status:	Date Created:	Drawing Scale:
Final Issue	09.10.2003	1:500

Drawing Number	Rev
14224 /A1 / 806	H

Project Leader:	Drawn By:	Initial Review:
TG	GD	GB

ANNEX 5

Existing Surface Water Network Model

Design Settings

Rainfall Methodology	FEH-22	Maximum Time of Concentration (mins)	30.00	Preferred Cover Depth (m)	1.200
Return Period (years)	100	Maximum Rainfall (mm/hr)	50.0	Include Intermediate Ground	✓
Additional Flow (%)	0	Minimum Velocity (m/s)	1.00	Enforce best practice design rules	✓
CV	0.750	Connection Type	Level Soffits		
Time of Entry (mins)	5.00	Minimum Backdrop Height (m)	0.600		

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Node Type	Manhole Type	Diameter (mm)	Width (mm)	Easting (m)	Northing (m)	Depth (m)
EX_CHANNELDRAIN		5.00	88.000	Manhole	1 STANDARD			381455.511	409044.277	0.325
12	0.126	5.00	87.950	Manhole	1 STANDARD	450	450	381474.543	409088.261	0.750
11	0.083	5.00	88.800	Manhole	1 STANDARD	1200		381479.184	409116.998	1.760
10	0.131	5.00	89.100	Manhole	1 STANDARD	1200		381579.031	409128.226	1.000
9	0.080	5.00	89.500	Manhole	1 STANDARD	1200		381541.770	409149.203	1.850
8	0.061	5.00	89.250	Manhole	1 STANDARD	1350		381492.774	409171.678	2.735
18	0.040	5.00	88.900	Manhole	1 STANDARD	1200		381484.361	409131.047	1.000
17	0.295	5.00	89.100	Manhole	1 STANDARD	1200		381492.673	409148.399	1.580
15	0.216	5.00	89.100	Manhole	1 STANDARD	1350		381572.307	409126.318	1.350
14	0.233	5.00	89.350	Manhole	1 STANDARD	1350		381539.277	409145.387	1.970
13	0.059	5.00	89.100	Manhole	1 STANDARD	1350		381500.507	409164.322	2.160
7			89.150	Manhole	1 STANDARD	1500		381497.507	409177.515	2.925
S4			88.518	Manhole	1 STANDARD	1500		381492.094	409192.255	2.373

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	Velocity Equation	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	Link Type	T of C (mins)	Rain (mm/hr)	Lateral Area (ha)	Lateral Ins Point (%)
6.001	EX_CHANNELDRAIN	12	72.500	0.600	Colebrook-White	87.675	87.650	0.025	2900.0	300	1 STANDARD	9.27	50.0	0.126	50
1.000	12	11	29.109	0.600	Colebrook-White	87.200	87.040	0.160	181.9	300	1 STANDARD	9.69	50.0		
1.001	11	8	56.343	0.600	Colebrook-White	87.040	86.590	0.450	125.2	300	1 STANDARD	10.36	50.0		
2.000	10	9	42.760	0.600	Colebrook-White	88.100	87.650	0.450	95.0	225	1 STANDARD	5.53	50.0		
2.001	9	8	53.904	0.600	Colebrook-White	87.650	87.110	0.540	99.8	225	1 STANDARD	6.22	50.0		
1.002	8	7	7.515	0.600	Colebrook-White	86.515	86.455	0.060	125.3	375	1 STANDARD	10.44	50.0		
3.000	18	17	19.240	0.600	Colebrook-White	87.900	87.670	0.230	83.7	150	1 STANDARD	5.29	50.0		
3.001	17	13	17.746	0.600	Colebrook-White	87.520	87.237	0.283	62.7	300	1 STANDARD	5.44	50.0		
4.000	15	14	38.140	0.600	Colebrook-White	87.750	87.380	0.370	103.1	450	1 STANDARD	5.32	50.0		
4.001	14	13	43.147	0.600	Colebrook-White	87.380	86.940	0.440	98.1	450	1 STANDARD	5.67	50.0		
3.002	13	7	13.529	0.600	Colebrook-White	86.940	86.790	0.150	90.2	450	1 STANDARD	5.77	50.0		
1.003	7	S4	15.703	0.600	Colebrook-White	86.225	86.145	0.080	196.3	525	1 STANDARD	10.60	50.0		

Name	US Node	DS Node	Vel (m/s)	Flow (l/s)	Σ Area (ha)
6.001	EX_CHANNELDRAIN	12	0.283	17.1	0.126
1.000	12	11	1.162	34.2	0.252
1.001	11	8	1.403	45.4	0.335
2.000	10	9	1.341	17.8	0.131
2.001	9	8	1.308	28.6	0.211
1.002	8	7	1.617	82.3	0.607
3.000	18	17	1.100	5.4	0.040
3.001	17	13	1.988	45.4	0.335
4.000	15	14	2.002	29.3	0.216
4.001	14	13	2.053	60.9	0.449
3.002	13	7	2.141	114.2	0.843
1.003	7	S4	1.595	196.5	1.450

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
6.001	72.500	2900.0	300	1 STANDARD	88.000	87.675	0.025	87.950	87.650	0.000
1.000	29.109	181.9	300	1 STANDARD	87.950	87.200	0.450	88.800	87.040	1.460
1.001	56.343	125.2	300	1 STANDARD	88.800	87.040	1.460	89.250	86.590	2.360
2.000	42.760	95.0	225	1 STANDARD	89.100	88.100	0.775	89.500	87.650	1.625
2.001	53.904	99.8	225	1 STANDARD	89.500	87.650	1.625	89.250	87.110	1.915
1.002	7.515	125.3	375	1 STANDARD	89.250	86.515	2.360	89.150	86.455	2.320
3.000	19.240	83.7	150	1 STANDARD	88.900	87.900	0.850	89.100	87.670	1.280
3.001	17.746	62.7	300	1 STANDARD	89.100	87.520	1.280	89.100	87.237	1.563
4.000	38.140	103.1	450	1 STANDARD	89.100	87.750	0.900	89.350	87.380	1.520
4.001	43.147	98.1	450	1 STANDARD	89.350	87.380	1.520	89.100	86.940	1.710
3.002	13.529	90.2	450	1 STANDARD	89.100	86.940	1.710	89.150	86.790	1.910
1.003	15.703	196.3	525	1 STANDARD	89.150	86.225	2.400	88.518	86.145	1.848

Link	US Node	Dia (mm)	Width (mm)	Node Type	MH Type	DS Node	Dia (mm)	Width (mm)	Node Type	MH Type
6.001	EX_CHANNELDRAIN			Manhole	1 STANDARD	12	450	450	Manhole	1 STANDARD
1.000	12	450	450	Manhole	1 STANDARD	11	1200		Manhole	1 STANDARD
1.001	11	1200		Manhole	1 STANDARD	8	1350		Manhole	1 STANDARD
2.000	10	1200		Manhole	1 STANDARD	9	1200		Manhole	1 STANDARD
2.001	9	1200		Manhole	1 STANDARD	8	1350		Manhole	1 STANDARD
1.002	8	1350		Manhole	1 STANDARD	7	1500		Manhole	1 STANDARD
3.000	18	1200		Manhole	1 STANDARD	17	1200		Manhole	1 STANDARD
3.001	17	1200		Manhole	1 STANDARD	13	1350		Manhole	1 STANDARD
4.000	15	1350		Manhole	1 STANDARD	14	1350		Manhole	1 STANDARD
4.001	14	1350		Manhole	1 STANDARD	13	1350		Manhole	1 STANDARD
3.002	13	1350		Manhole	1 STANDARD	7	1500		Manhole	1 STANDARD
1.003	7	1500		Manhole	1 STANDARD	S4	1500		Manhole	1 STANDARD

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Width (mm)	Node Type	MH Type	Connections	Link	IL (m)	Dia (mm)	Link Type	
EX_CHANNELDRAIN	381455.511	409044.277	88.000	0.325			Manhole	1 STANDARD		0	6.001	87.675	300	1 STANDARD
12	381474.543	409088.261	87.950	0.750	450	450	Manhole	1 STANDARD		1	6.001	87.650	300	1 STANDARD
11	381479.184	409116.998	88.800	1.760	1200		Manhole	1 STANDARD		0	1.000	87.200	300	1 STANDARD
										1	1.000	87.040	300	1 STANDARD
10	381579.031	409128.226	89.100	1.000	1200		Manhole	1 STANDARD		0	1.001	87.040	300	1 STANDARD
9	381541.770	409149.203	89.500	1.850	1200		Manhole	1 STANDARD		0	2.000	88.100	225	1 STANDARD
										1	2.000	87.650	225	1 STANDARD
8	381492.774	409171.678	89.250	2.735	1350		Manhole	1 STANDARD		0	2.001	87.650	225	1 STANDARD
										1	2.001	87.110	225	1 STANDARD
										2	1.001	86.590	300	1 STANDARD
18	381484.361	409131.047	88.900	1.000	1200		Manhole	1 STANDARD		0	1.002	86.515	375	1 STANDARD
17	381492.673	409148.399	89.100	1.580	1200		Manhole	1 STANDARD		0	3.000	87.900	150	1 STANDARD
										1	3.000	87.670	150	1 STANDARD
										0	3.001	87.520	300	1 STANDARD

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Width (mm)	Node Type	MH Type	Connections	Link	IL (m)	Dia (mm)	Link Type	
15	381572.307	409126.318	89.100	1.350	1350		Manhole	1 STANDARD		0	4.000	87.750	450	1 STANDARD
14	381539.277	409145.387	89.350	1.970	1350		Manhole	1 STANDARD		1	4.000	87.380	450	1 STANDARD
13	381500.507	409164.322	89.100	2.160	1350		Manhole	1 STANDARD		0	4.001	87.380	450	1 STANDARD
7	381497.507	409177.515	89.150	2.925	1500		Manhole	1 STANDARD		1	3.002	86.940	450	1 STANDARD
S4	381492.094	409192.255	88.518	2.373	1500		Manhole	1 STANDARD		2	3.001	87.237	300	1 STANDARD
										0	3.002	86.940	450	1 STANDARD
										1	3.002	86.790	450	1 STANDARD
										2	1.002	86.455	375	1 STANDARD
										0	1.003	86.225	525	1 STANDARD
										1	1.003	86.145	525	1 STANDARD

Simulation Settings

Rainfall Methodology	FEH-22	Winter CV	0.840	Drain Down Time (mins)	240	Check Discharge Rate(s)	x
Rainfall Events	Singular	Analysis Speed	Normal	Additional Storage (m³/ha)	20.0	Check Discharge Volume	x
Summer CV	0.750	Skip Steady State	x	Starting Level (m)			

Storm Durations

15 | 30 | 60 | 120 | 180 | 240 | 360

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)	Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
1	0	0	0	100	0	0	0
30	0	0	0	100	45	0	0

Results for 1 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	EX_CHANNELDRAIN	12	87.785	0.110	2.0	0.0000	0.0000	OK
15 minute winter	6.001:50%	12	87.781	0.119	11.0	0.0000	0.0000	OK
15 minute winter	12	11	87.300	0.100	19.0	0.3575	0.0000	OK
15 minute winter	11	12	87.143	0.103	25.6	0.2145	0.0000	OK
15 minute winter	10	10	88.169	0.069	11.4	0.2591	0.0000	OK
15 minute winter	9	11	87.741	0.091	18.0	0.1818	0.0000	OK
15 minute winter	8	11	86.661	0.146	46.4	0.2745	0.0000	OK
15 minute winter	18	10	87.943	0.043	3.5	0.0835	0.0000	OK
15 minute winter	17	10	87.617	0.097	29.1	0.4723	0.0000	OK
15 minute winter	15	10	87.822	0.072	18.9	0.3357	0.0000	OK
15 minute winter	14	11	87.482	0.102	38.8	0.3876	0.0000	OK
15 minute winter	13	11	87.094	0.154	71.2	0.3055	0.0000	OK
15 minute winter	7	11	86.456	0.231	117.9	0.4078	0.0000	OK
15 minute winter	S4	11	86.352	0.207	117.8	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)
15 minute winter	EX_CHANNELDRAIN	6.001	6.001:50%	-2.0	-0.173	-0.098	0.8938	
15 minute winter	EX_CHANNELDRAIN	6.001	12	8.9	0.468	0.448	0.7006	
15 minute winter	12	1.000	11	18.7	0.895	0.228	0.6091	
15 minute winter	11	1.001	8	24.8	1.171	0.250	1.1944	
15 minute winter	10	2.000	9	11.0	0.902	0.207	0.5419	
15 minute winter	9	2.001	8	17.4	1.175	0.335	0.7990	
15 minute winter	8	1.002	7	46.3	1.270	0.259	0.2742	
15 minute winter	18	3.000	17	3.4	0.820	0.174	0.0795	
15 minute winter	17	3.001	13	28.5	1.517	0.203	0.3346	
15 minute winter	15	4.000	14	18.4	0.860	0.058	0.8247	
15 minute winter	14	4.001	13	38.0	1.024	0.116	1.6189	
15 minute winter	13	3.002	7	71.9	1.611	0.211	0.6042	
15 minute winter	7	1.003	S4	117.8	1.385	0.341	1.3366	58.3

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.95%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	EX_CHANNELDRAIN	11	87.903	0.228	3.8	0.0000	0.0000	OK
15 minute winter	6.001:50%	11	87.903	0.240	41.0	0.0000	0.0000	OK
15 minute winter	12	12	87.563	0.363	77.1	1.2932	0.0000	SURCHARGED
15 minute winter	11	12	87.408	0.368	100.0	0.7629	0.0000	SURCHARGED
15 minute winter	10	11	88.257	0.157	42.7	0.5880	0.0000	OK
15 minute winter	9	12	88.041	0.391	68.0	0.7805	0.0000	SURCHARGED
15 minute winter	8	11	86.959	0.444	170.8	0.8325	0.0000	SURCHARGED
15 minute winter	18	10	87.993	0.093	13.1	0.1805	0.0000	OK
15 minute winter	17	10	87.743	0.223	108.8	1.0863	0.0000	OK
15 minute winter	15	10	87.895	0.145	70.4	0.6711	0.0000	OK
15 minute winter	14	10	87.589	0.209	145.4	0.7917	0.0000	OK
15 minute winter	13	11	87.298	0.358	270.4	0.7089	0.0000	OK
15 minute winter	7	11	86.845	0.620	438.6	1.0947	0.0000	SURCHARGED
15 minute winter	S4	11	86.589	0.444	438.5	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)
15 minute winter	EX_CHANNELDRAIN	6.001	6.001:50%	-3.8	-0.232	-0.191	2.1374	
15 minute winter	EX_CHANNELDRAIN	6.001	12	38.3	0.787	1.916	1.7393	
15 minute winter	12	1.000	11	73.0	1.188	0.889	2.0498	
15 minute winter	11	1.001	8	98.0	1.419	0.988	3.9676	
15 minute winter	10	2.000	9	42.0	1.194	0.787	1.4817	
15 minute winter	9	2.001	8	60.3	1.519	1.160	2.0789	
15 minute winter	8	1.002	7	172.2	1.695	0.964	0.8289	
15 minute winter	18	3.000	17	12.7	1.145	0.656	0.2147	
15 minute winter	17	3.001	13	107.1	2.056	0.762	0.9253	
15 minute winter	15	4.000	14	69.4	1.212	0.218	2.2101	
15 minute winter	14	4.001	13	144.0	1.376	0.441	4.4537	
15 minute winter	13	3.002	7	270.1	2.189	0.793	1.6621	
15 minute winter	7	1.003	S4	438.5	2.046	1.270	3.2257	217.9

Results for 100 year Critical Storm Duration. Lowest mass balance: 99.91%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	EX_CHANNELDRAIN	11	88.000	0.325	4.7	0.0000	0.1636	FLOOD
15 minute winter	6.001:50%	12	87.980	0.317	51.5	0.9650	0.0000	PONDING
15 minute winter	12	11	87.950	0.750	96.8	2.6720	0.2739	FLOOD
15 minute winter	11	11	87.770	0.730	109.5	1.5146	0.0000	SURCHARGED
15 minute winter	10	12	88.694	0.594	53.6	2.2285	0.0000	SURCHARGED
15 minute winter	9	12	88.354	0.704	75.6	1.4053	0.0000	SURCHARGED
15 minute winter	8	11	87.146	0.631	200.3	1.1851	0.0000	SURCHARGED
15 minute winter	18	10	88.011	0.111	16.4	0.2139	0.0000	OK
15 minute winter	17	10	87.800	0.280	136.9	1.3619	0.0000	OK
15 minute winter	15	10	87.916	0.166	88.4	0.7693	0.0000	OK
15 minute winter	14	10	87.615	0.235	182.6	0.8904	0.0000	OK
15 minute winter	13	11	87.435	0.495	337.8	0.9791	0.0000	SURCHARGED
15 minute winter	7	11	86.985	0.760	536.0	1.3427	0.0000	SURCHARGED
15 minute winter	S4	11	86.622	0.477	536.0	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 winter	EX_CHANNELDRAIN	6.001	6.001:50%	7.8	-0.243	0.390	2.5527	
15 minute winter	EX_CHANNELDRAIN	6.001	12	51.5	0.833	2.578	2.5517	
15 minute winter	12	1.000	11	87.4	1.241	1.064	2.0498	
15 minute winter	11	1.001	8	110.7	1.572	1.116	3.9676	
15 minute winter	10	2.000	9	44.9	1.204	0.842	1.7006	
15 minute winter	9	2.001	8	69.7	1.753	1.340	2.1095	
15 minute winter	8	1.002	7	201.1	1.824	1.126	0.8289	
15 minute winter	18	3.000	17	16.1	1.167	0.830	0.2901	
15 minute winter	17	3.001	13	133.2	2.102	0.948	1.1176	
15 minute winter	15	4.000	14	87.2	1.279	0.274	2.6053	
15 minute winter	14	4.001	13	180.9	1.406	0.554	5.2166	
15 minute winter	13	3.002	7	336.1	2.261	0.987	1.9714	
15 minute winter	7	1.003	S4	536.0	2.482	1.552	3.3146	273.8

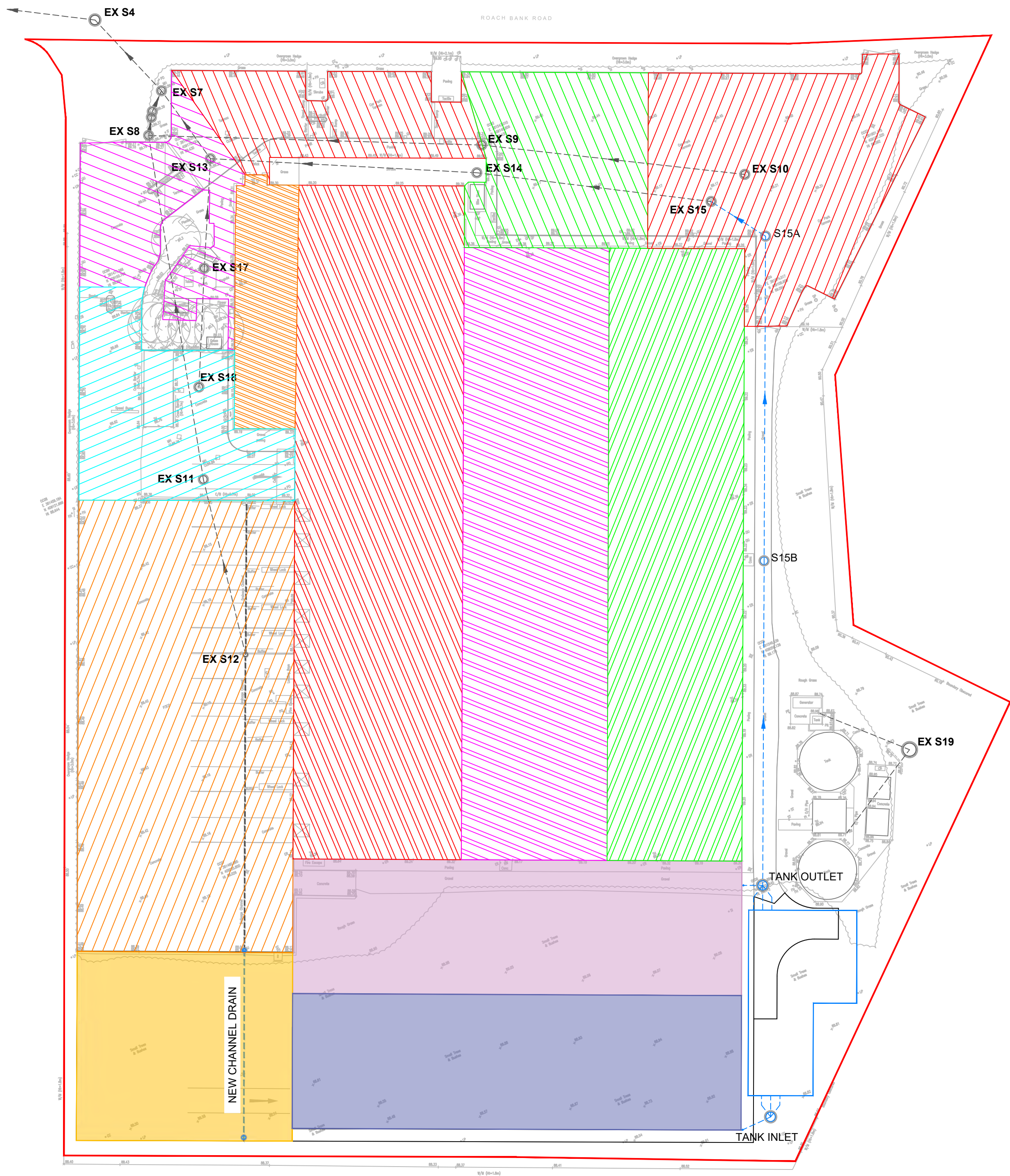
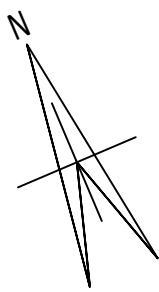
Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 99.89%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
30 minute winter	EX_CHANNELDRAIN	17	88.000	0.325	5.5	0.0000	0.0247	FLOOD
15 minute winter	6.001:50%	13	87.988	0.326	75.4	7.9965	0.0000	PONDING
15 minute winter	12	9	87.950	0.750	111.2	2.6723	12.0245	FLOOD
15 minute winter	11	10	87.874	0.834	109.9	1.7298	0.0000	SURCHARGED
15 minute winter	10	10	89.100	1.000	77.4	3.7510	5.7062	FLOOD
15 minute winter	9	11	88.867	1.217	89.5	2.4282	0.0000	SURCHARGED
15 minute winter	8	11	87.369	0.854	218.5	1.6036	0.0000	SURCHARGED
15 minute winter	18	12	88.660	0.760	23.7	1.4679	0.0000	FLOOD RISK
15 minute winter	17	11	88.380	0.860	190.1	4.1816	0.0000	SURCHARGED
15 minute winter	15	11	88.049	0.299	127.8	1.3853	0.0000	OK
15 minute winter	14	11	88.013	0.633	251.7	2.4029	0.0000	SURCHARGED
15 minute winter	13	11	87.703	0.763	456.0	1.5101	0.0000	SURCHARGED
15 minute winter	7	11	87.188	0.963	667.8	1.7018	0.0000	SURCHARGED
15 minute summer	S4	11	86.642	0.497	654.3	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 winter	EX_CHANNELDRAIN	6.001	6.001:50%	-5.5	-0.227	-0.278	2.5527	
30 minute winter	EX_CHANNELDRAIN	6.001	12	60.8	0.944	3.040	2.5517	
15 minute winter	12	1.000	11	92.9	1.319	1.131	2.0498	
15 minute winter	11	1.001	8	110.4	1.570	1.113	3.9676	
15 minute winter	10	2.000	9	48.5	1.222	0.909	1.7006	
15 minute winter	9	2.001	8	81.6	2.053	1.569	2.1438	
15 minute winter	8	1.002	7	214.2	1.942	1.199	0.8289	
15 minute winter	18	3.000	17	23.8	1.351	1.224	0.3387	
15 minute winter	17	3.001	13	183.4	2.604	1.305	1.2497	
15 minute winter	15	4.000	14	121.9	1.264	0.383	5.1549	
15 minute winter	14	4.001	13	240.5	1.518	0.737	6.8364	
15 minute winter	13	3.002	7	454.8	2.871	1.336	2.1219	
15 minute winter	7	1.003	S4	667.1	3.088	1.932	3.3581	380.9

ANNEX 6

Impermeable Area Plan



NOTES

- THIS DRAWING TO BE READ IN CONJUNCTION WITH ALL RELEVANT WEETWOOD DRAWINGS. ANY DISCREPANCIES, ERRORS OR OMISSIONS TO BE BROUGHT TO THE ATTENTION OF WEETWOOD.
- ANNUAL EXCEEDANCE PROBABILITY RAINFALL EVENTS:
 - 100.0% (1:1) AEP RAINFALL EVENT
 - 50.0% (2:2) AEP RAINFALL EVENT
 - 43.5% (QBAR) AEP RAINFALL EVENT
 - 3.3% (1:30) AEP RAINFALL EVENT
 - 1.0% (1:100) AEP RAINFALL EVENT
- PROPOSED SITE LAYOUT TAKEN FROM UMC ARCHITECTS 'PROPOSED SITE PLAN' DRAWING (REF: 21663-F0002-B, AUG 2022).
- EXISTING LEVEL INFORMATION TAKEN FROM N D OLIVER & CO 'TOPOGRAPHIC SURVEY' (REF: 11903, JUL 2022).
- EXISTING DRAINAGE LOCATION TAKEN FROM CLIENT SUPPLIED RECORDS DRAWING BY BURKS GREEN (NOV 2004)
 - 'COORDINATED DRAINAGE LAYOUT' (REF: 14224/ A1 / 310 REV D)
 - 'INTERCEPTOR DETAILS' (REF: 14224/ A1 / 318 REV A)
 - 'OVERALL SITE DRAINAGE' (REF: 14224 / A1 / 806 REV H)

IMPERMEABLE AREA KEY

- PROPOSED SURFACE WATER SEWER
- EXISTING SURFACE WATER SEWER
- SITE BOUNDARY

PROPOSED IMPERMEABLE AREA

- NEW CHANNEL DRAIN (0.106ha)
- TANK INLET (0.158ha)
- TANK OUTLET (0.158ha)
- TOTAL = 0.422ha

EXISTING IMPERMEABLE AREA

- S8 (0.061ha)
- S9 (0.080ha)
- S10 (0.131ha)
- S11 (0.083ha)
- S12 (0.252ha)
- S13 (0.059ha)
- S14 (0.233ha)
- S15 (0.216ha)
- S17 (0.295ha)
- S18 (0.040ha)
- TOTAL = 1.450ha

P1	11.03.26	ISSUED TO ACCOMPANY DoC TECHNICAL NOTE	DSH	TB
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REV	DATE	DESCRIPTION	DRAWN BY	CHECK BY
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Development • Planning • Environment

Park House, Ffordd
Byrmwr Gwair, Mold
CH7 1FQ
Tel 01352 700045
info@weetwood.net
www.weetwood.net

Client
ROACH PILSWORTH LTD

Drawing Status PLANNING	Date MAR 2026
Project UNIT 3 - L'OREAL FACILITY ROACH BANK ROAD, BURY	Scale (A1) 1:500
Drawing Number 5655-WTWD-00-XX-DR-D-105	Drawn by DSH
Drawing Title IMPERMEABLE AREA PLAN	Check by TB
	Revision P1

ANNEX 7

Proposed Surface Water Network Model

Design Settings

Rainfall Methodology	FEH-22	Maximum Time of Concentration (mins)	30.00	Preferred Cover Depth (m)	1.200
Return Period (years)	100	Maximum Rainfall (mm/hr)	50.0	Include Intermediate Ground	✓
Additional Flow (%)	0	Minimum Velocity (m/s)	1.00	Enforce best practice design rules	✓
CV	0.750	Connection Type	Level Soffits		
Time of Entry (mins)	5.00	Minimum Backdrop Height (m)	0.600		

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Node Type	Manhole Type	Diameter (mm)	Width (mm)	Easting (m)	Northing (m)	Depth (m)
CHANNEL DRAIN	0.035	5.00	88.150	Junction		450	450	381443.391	409015.968	0.470
EX_CHANNELDRAIN	0.035	5.00	88.150	Junction		450	450	381455.511	409044.277	0.475
12	0.126	5.00	87.950	Manhole	1 STANDARD	450	450	381474.378	409088.261	0.750
11	0.083	5.00	88.800	Manhole	1 STANDARD	1200		381479.184	409116.998	1.760
10	0.131	5.00	89.100	Manhole	1 STANDARD	1200		381579.031	409128.226	1.000
9	0.080	5.00	89.500	Manhole	1 STANDARD	1200		381541.770	409149.203	1.850
8	0.061	5.00	89.250	Manhole	1 STANDARD	1350		381492.774	409171.678	2.735
18	0.040	5.00	88.900	Manhole	1 STANDARD	1200		381484.361	409131.047	1.000
17	0.295	5.00	89.100	Manhole	1 STANDARD	1200		381492.673	409148.399	1.580
TANK_IN	0.158	5.00	89.330	Manhole	1 STANDARD	1500		381523.324	408986.317	0.880
TANK_OUT	0.158	5.00	89.330	Manhole	1 STANDARD	1500		381536.773	409021.230	0.920
15B			89.150	Manhole	1 STANDARD	1500		381557.497	409069.466	0.970
15A			89.100	Manhole	1 STANDARD	1500		381578.221	409117.703	1.150
15	0.216	5.00	89.100	Manhole	1 STANDARD	1350		381572.307	409126.318	1.350
14	0.233	5.00	89.350	Manhole	1 STANDARD	1350		381539.277	409145.387	1.970
13	0.059	5.00	89.100	Manhole	1 STANDARD	1350		381500.507	409164.322	2.160
7			89.150	Manhole	1 STANDARD	1500		381497.507	409177.515	2.925
S4			88.518	Manhole	1 STANDARD	1500		381492.094	409192.255	2.373

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	Velocity Equation	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	Link Type	T of C (mins)	Rain (mm/hr)	Lateral Area (ha)	Lateral Ins Point (%)
6.000	CHANNEL DRAIN	EX_CHANNELDRAIN	30.794	0.600	Colebrook-White	87.680	87.675	0.005	6158.9	450	1 STANDARD	7.06	50.0	0.036	50
6.001	EX_CHANNELDRAIN	12	72.500	0.600	Colebrook-White	87.675	87.650	0.025	2900.0	300	1 STANDARD	11.33	50.0	0.126	50
1.000	12	11	29.136	0.600	Colebrook-White	87.200	87.040	0.160	182.1	300	1 STANDARD	11.75	50.0		
1.001	11	8	56.343	0.600	Colebrook-White	87.040	86.590	0.450	125.2	300	1 STANDARD	12.42	50.0		
2.000	10	9	42.760	0.600	Colebrook-White	88.100	87.650	0.450	95.0	225	1 STANDARD	5.53	50.0		
2.001	9	8	53.904	0.600	Colebrook-White	87.650	87.110	0.540	99.8	225	1 STANDARD	6.22	50.0		
1.002	8	7	7.515	0.600	Colebrook-White	86.515	86.455	0.060	125.3	375	1 STANDARD	12.50	50.0		
3.000	18	17	19.240	0.600	Colebrook-White	87.900	87.670	0.230	83.7	150	1 STANDARD	5.29	50.0		
3.001	17	13	17.746	0.600	Colebrook-White	87.520	87.237	0.283	62.7	300	1 STANDARD	5.44	50.0		
5.000	TANK_IN	TANK_OUT	6.000	0.600	Colebrook-White	88.450	88.410	0.040	150.0	300	1 STANDARD	5.08	50.0		
5.001	TANK_OUT	15B	52.499	0.600	Colebrook-White	88.410	88.180	0.230	228.3	300	1 STANDARD	5.92	50.0		
5.002	15B	15A	52.500	0.600	Colebrook-White	88.180	87.950	0.230	228.3	300	1 STANDARD	6.77	50.0		
5.003	15A	15	10.450	0.600	Colebrook-White	87.950	87.900	0.050	209.0	300	1 STANDARD	6.93	50.0		
4.000	15	14	38.140	0.600	Colebrook-White	87.750	87.380	0.370	103.1	450	1 STANDARD	7.25	50.0		

Name	US Node	DS Node	Vel (m/s)	Flow (l/s)	Σ Area (ha)
6.000	CHANNEL DRAIN	EX_CHANNELDRAIN	0.249	9.6	0.071
6.001	EX_CHANNELDRAIN	12	0.283	31.4	0.232
1.000	12	11	1.162	48.5	0.358
1.001	11	8	1.403	59.8	0.441
2.000	10	9	1.341	17.8	0.131
2.001	9	8	1.308	28.6	0.211
1.002	8	7	1.617	96.6	0.713
3.000	18	17	1.100	5.4	0.040
3.001	17	13	1.988	45.4	0.335
5.000	TANK_IN	TANK_OUT	1.281	21.4	0.158
5.001	TANK_OUT	15B	1.036	42.8	0.316
5.002	15B	15A	1.036	42.8	0.316
5.003	15A	15	1.084	42.8	0.316
4.000	15	14	2.002	72.1	0.532

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	Velocity Equation	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	Link Type	T of C (mins)	Rain (mm/hr)	Lateral Area (ha)	Lateral Ins Point (%)
4.001	14	13	43.147	0.600	Colebrook-White	87.380	86.940	0.440	98.1	450	1 STANDARD	7.60	50.0		
3.002	13	7	13.529	0.600	Colebrook-White	86.940	86.790	0.150	90.2	450	1 STANDARD	7.70	50.0		
1.003	7	S4	15.703	0.600	Colebrook-White	86.225	86.145	0.080	196.3	525	1 STANDARD	12.66	50.0		

Name	US Node	DS Node	Vel (m/s)	Flow (l/s)	Σ Area (ha)
4.001	14	13	2.053	103.7	0.765
3.002	13	7	2.141	157.1	1.159
1.003	7	S4	1.595	253.7	1.872

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
6.000	30.794	6158.9	450	1 STANDARD	88.150	87.680	0.020	88.150	87.675	0.025
6.001	72.500	2900.0	300	1 STANDARD	88.150	87.675	0.175	87.950	87.650	0.000
1.000	29.136	182.1	300	1 STANDARD	87.950	87.200	0.450	88.800	87.040	1.460
1.001	56.343	125.2	300	1 STANDARD	88.800	87.040	1.460	89.250	86.590	2.360
2.000	42.760	95.0	225	1 STANDARD	89.100	88.100	0.775	89.500	87.650	1.625
2.001	53.904	99.8	225	1 STANDARD	89.500	87.650	1.625	89.250	87.110	1.915
1.002	7.515	125.3	375	1 STANDARD	89.250	86.515	2.360	89.150	86.455	2.320

Link	US Node	Dia (mm)	Width (mm)	Node Type	MH Type	DS Node	Dia (mm)	Width (mm)	Node Type	MH Type
6.000	CHANNEL DRAIN	450	450	Junction		EX_CHANNELDRAIN	450	450	Junction	
6.001	EX_CHANNELDRAIN	450	450	Junction		12	450	450	Manhole	1 STANDARD
1.000	12	450	450	Manhole	1 STANDARD	11	1200		Manhole	1 STANDARD
1.001	11	1200		Manhole	1 STANDARD	8	1350		Manhole	1 STANDARD
2.000	10	1200		Manhole	1 STANDARD	9	1200		Manhole	1 STANDARD
2.001	9	1200		Manhole	1 STANDARD	8	1350		Manhole	1 STANDARD
1.002	8	1350		Manhole	1 STANDARD	7	1500		Manhole	1 STANDARD

Pipeline Schedule

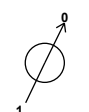
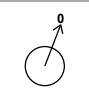
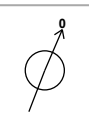
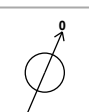
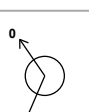
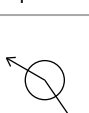
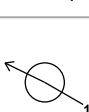
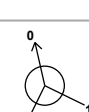
Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
3.000	19.240	83.7	150	1 STANDARD	88.900	87.900	0.850	89.100	87.670	1.280
3.001	17.746	62.7	300	1 STANDARD	89.100	87.520	1.280	89.100	87.237	1.563
5.000	6.000	150.0	300	1 STANDARD	89.330	88.450	0.580	89.330	88.410	0.620
5.001	52.499	228.3	300	1 STANDARD	89.330	88.410	0.620	89.150	88.180	0.670
5.002	52.500	228.3	300	1 STANDARD	89.150	88.180	0.670	89.100	87.950	0.850
5.003	10.450	209.0	300	1 STANDARD	89.100	87.950	0.850	89.100	87.900	0.900
4.000	38.140	103.1	450	1 STANDARD	89.100	87.750	0.900	89.350	87.380	1.520
4.001	43.147	98.1	450	1 STANDARD	89.350	87.380	1.520	89.100	86.940	1.710
3.002	13.529	90.2	450	1 STANDARD	89.100	86.940	1.710	89.150	86.790	1.910
1.003	15.703	196.3	525	1 STANDARD	89.150	86.225	2.400	88.518	86.145	1.848

Link	US Node	Dia (mm)	Width (mm)	Node Type	MH Type	DS Node	Dia (mm)	Width (mm)	Node Type	MH Type
3.000	18	1200		Manhole	1 STANDARD	17	1200		Manhole	1 STANDARD
3.001	17	1200		Manhole	1 STANDARD	13	1350		Manhole	1 STANDARD
5.000	TANK_IN	1500		Manhole	1 STANDARD	TANK_OUT	1500		Manhole	1 STANDARD
5.001	TANK_OUT	1500		Manhole	1 STANDARD	15B	1500		Manhole	1 STANDARD
5.002	15B	1500		Manhole	1 STANDARD	15A	1500		Manhole	1 STANDARD
5.003	15A	1500		Manhole	1 STANDARD	15	1350		Manhole	1 STANDARD
4.000	15	1350		Manhole	1 STANDARD	14	1350		Manhole	1 STANDARD
4.001	14	1350		Manhole	1 STANDARD	13	1350		Manhole	1 STANDARD
3.002	13	1350		Manhole	1 STANDARD	7	1500		Manhole	1 STANDARD
1.003	7	1500		Manhole	1 STANDARD	S4	1500		Manhole	1 STANDARD

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Width (mm)	Node Type	MH Type	Connections	Link	IL (m)	Dia (mm)	Link Type	
CHANNEL DRAIN	381443.391	409015.968	88.150	0.470	450	450	Junction							
									0	6.000	87.680	450	1 STANDARD	
EX_CHANNELDRAIN	381455.511	409044.277	88.150	0.475	450	450	Junction			1	6.000	87.675	450	1 STANDARD
									0	6.001	87.675	300	1 STANDARD	
12	381474.378	409088.261	87.950	0.750	450	450	Manhole	1 STANDARD		1	6.001	87.650	300	1 STANDARD
									0	1.000	87.200	300	1 STANDARD	
11	381479.184	409116.998	88.800	1.760	1200		Manhole	1 STANDARD		1	1.000	87.040	300	1 STANDARD
									0	1.001	87.040	300	1 STANDARD	
10	381579.031	409128.226	89.100	1.000	1200		Manhole	1 STANDARD						
									0	2.000	88.100	225	1 STANDARD	
9	381541.770	409149.203	89.500	1.850	1200		Manhole	1 STANDARD		1	2.000	87.650	225	1 STANDARD
									0	2.001	87.650	225	1 STANDARD	
8	381492.774	409171.678	89.250	2.735	1350		Manhole	1 STANDARD		1	2.001	87.110	225	1 STANDARD
									2	1.001	86.590	300	1 STANDARD	
									0	1.002	86.515	375	1 STANDARD	
18	381484.361	409131.047	88.900	1.000	1200		Manhole	1 STANDARD						
									0	3.000	87.900	150	1 STANDARD	

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Width (mm)	Node Type	MH Type	Connections	Link	IL (m)	Dia (mm)	Link Type	
17	381492.673	409148.399	89.100	1.580	1200		Manhole	1 STANDARD		1	3.000	87.670	150	1 STANDARD
TANK_IN	381523.324	408986.317	89.330	0.880	1500		Manhole	1 STANDARD		0	3.001	87.520	300	1 STANDARD
TANK_OUT	381536.773	409021.230	89.330	0.920	1500		Manhole	1 STANDARD		1	5.000	88.410	300	1 STANDARD
15B	381557.497	409069.466	89.150	0.970	1500		Manhole	1 STANDARD		0	5.001	88.410	300	1 STANDARD
15A	381578.221	409117.703	89.100	1.150	1500		Manhole	1 STANDARD		1	5.002	87.950	300	1 STANDARD
15	381572.307	409126.318	89.100	1.350	1350		Manhole	1 STANDARD		0	5.003	87.950	300	1 STANDARD
14	381539.277	409145.387	89.350	1.970	1350		Manhole	1 STANDARD		1	4.000	87.750	450	1 STANDARD
13	381500.507	409164.322	89.100	2.160	1350		Manhole	1 STANDARD		1	4.001	86.940	450	1 STANDARD
										2	3.001	87.237	300	1 STANDARD
										0	3.002	86.940	450	1 STANDARD

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Width (mm)	Node Type	MH Type	Connections	Link	IL (m)	Dia (mm)	Link Type	
7	381497.507	409177.515	89.150	2.925	1500		Manhole	1 STANDARD		1	3.002	86.790	450	1 STANDARD
									2	1.002	86.455	375	1 STANDARD	
									0	1.003	86.225	525	1 STANDARD	
S4	381492.094	409192.255	88.518	2.373	1500		Manhole	1 STANDARD		1	1.003	86.145	525	1 STANDARD

Simulation Settings

Rainfall Methodology	FEH-22	Winter CV	0.840	Drain Down Time (mins)	240	Check Discharge Rate(s)	x
Rainfall Events	Singular	Analysis Speed	Normal	Additional Storage (m³/ha)	20.0	Check Discharge Volume	x
Summer CV	0.750	Skip Steady State	x	Starting Level (m)			

Storm Durations

15 | 30 | 60 | 120 | 180 | 240 | 360

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)	Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
1	0	0	0	100	0	0	0
30	0	0	0	100	45	0	0

Node 15A Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	87.950	Product Number	CTL-SHE-0081-3000-1100-3000
Design Depth (m)	1.100	Min Outlet Diameter (m)	0.100
Design Flow (l/s)	3.0	Min Node Diameter (mm)	1200