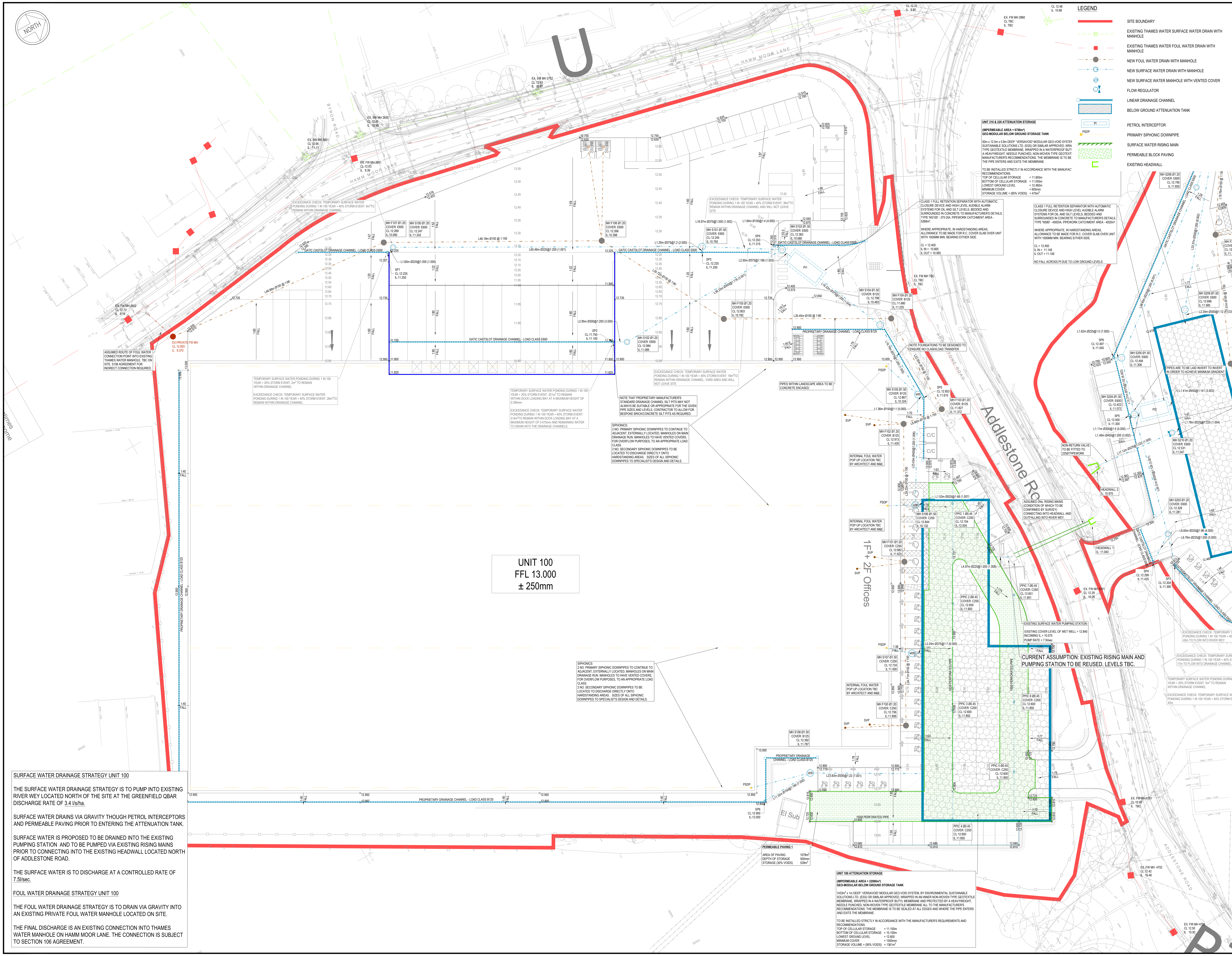

CLASS 1 FULL RETENTION SEPARATOR WITH AUTOMATIC CLOSURE DEVICE AND HIGH LEVEL AUDIBLE ALARM SYSTEMS FOR OIL AND SILT LEVELS, BEDDED AND SURROUNDED IN CONCRETE TO MANUFACTURER'S DETAILS. TYPE 'NS100' - 375 DIA. PIPEWORK CATCHMENT AREA - 5368m².

WHERE APPROPRIATE, IN HARDSTANDING AREAS, ALLOWANCE TO BE MADE FOR R.C. COVER SLAB OVER UNIT WITH 1000MM MIN. BEARING EITHER SIDE.

CL = 12.400
IL IN = 10.665
IL OUT = 10.565

CLASS 1 FULL RETENTION SEPARATOR WITH AUTOMATIC CLOSURE DEVICE AND HIGH LEVEL AUDIBLE ALARM SYSTEMS FOR OIL AND SILT LEVELS, BEDDED AND SURROUNDED IN CONCRETE TO MANUFACTURER'S DETAILS. TYPE 'NS80' - 450DIA. PIPEWORK CATCHMENT AREA - 4020m².

WHERE APPROPRIATE, IN HARDSTANDING AREAS, ALLOWANCE TO BE MADE FOR R.C. COVER SLAB OVER UNIT WITH 1000MM MIN. BEARING EITHER SIDE.

CL = 12.450
IL IN = 11.149
IL OUT = 11.149

NO FALL ACROSS PI DUE TO LOW GROUND LEVELS

UNIT 210 & 220 ATTENUATION STORAGE

(IMPERMEABLE AREA = 6788m²)
GEO-MODULAR BELOW GROUND STORAGE TANK

50m x 12.5m x 0.8m DEEP `VERSAVOID' MODULAR GEO-VOID SYSTEM SUSTAINABLE SOLUTIONS LTD. (ESS) OR SIMILAR APPROVED, WRA TYPE GEOTEXTILE MEMBRANE, WRAPPED IN A WATERPROOF BUTY A HEAVYWEIGHT, NEEDLE PUNCHED, NON-WOVEN TYPE GEOTEXT MANUFACTURER'S RECOMMENDATIONS. THE MEMBRANE IS TO BE THE PIPE ENTERS AND EXITS THE MEMBRANE.

TO BE INSTALLED STRICTLY IN ACCORDANCE WITH THE MANUFACT RECOMMENDATIONS.

TOP OF CELLULAR STORAGE	= 11.855m
BOTTOM OF CELLULAR STORAGE	= 11.055m
LOWEST GROUND LEVEL	= 12.460m
MINIMUM COVER	= 605mm
STORAGE VOLUME = (95% VOIDS)	= 475m³

PERMEABLE PAVING 1

AREA OF PAVING	1078m²
DEPTH OF STORAGE	500mm
STORAGE (30% VOIDS)	539m³

UNIT 100 ATTENUATION STORAGE

(IMPERMEABLE AREA = 22080m²)
GEO-MODULAR BELOW GROUND STORAGE TANK

1433m² x 1m DEEP `VERSAVOID' MODULAR GEO-VOID SYSTEM, BY ENVIRONMENTAL SUSTAINABLE SOLUTIONS LTD. (ESS) OR SIMILAR APPROVED, WRAPPED IN AN INNER NON-WOVEN TYPE GEOTEXTILE MEMBRANE, WRAPPED IN A WATERPROOF BUTYL MEMBRANE AND PROTECTED BY A HEAVYWEIGHT, NEEDLE PUNCHED, NON-WOVEN TYPE GEOTEXTILE MEMBRANE ALL TO THE MANUFACTURER'S RECOMMENDATIONS. THE MEMBRANE IS TO BE SEALED AT ALL EDGES AND WHERE THE PIPE ENTERS AND EXITS THE MEMBRANE.

TO BE INSTALLED STRICTLY IN ACCORDANCE WITH THE MANUFACTURER'S REQUIREMENTS AND RECOMMENDATIONS.

TOP OF CELLULAR STORAGE	= 11.100m
BOTTOM OF CELLULAR STORAGE	= 10.100m
LOWEST GROUND LEVEL	= 12.600
MINIMUM COVER	= 1500mm
STORAGE VOLUME = (95% VOIDS)	= 1361m³

SURFACE WATER DRAINAGE STRATEGY UNIT 100

THE SURFACE WATER DRAINAGE STRATEGY IS TO PUMP INTO EXISTING RIVER WEY LOCATED NORTH OF THE SITE AT THE GREENFIELD QBAR DISCHARGE RATE OF 3.4 l/s/ha.

SURFACE WATER DRAINS VIA GRAVITY THOUGH PETROL INTERCEPTORS AND PERMEABLE PAVING PRIOR TO ENTERING THE ATTENUATION TANK.

SURFACE WATER IS PROPOSED TO BE DRAINED INTO THE EXISTING PUMPING STATION AND TO BE PUMPED VIA EXISTING RISING MAINS PRIOR TO CONNECTING INTO THE EXISTING HEADWALL LOCATED NORTH OF ADDLESTONE ROAD.

THE SURFACE WATER IS TO DISCHARGE AT A CONTROLLED RATE OF 7.5l/sec.

FOUL WATER DRAINAGE STRATEGY UNIT 100

THE FOUL WATER DRAINAGE STRATEGY IS TO DRAIN VIA GRAVITY INTO AN EXISTING PRIVATE FOUL WATER MANHOLE LOCATED ON SITE.

THE FINAL DISCHARGE IS AN EXISTING CONNECTION INTO THAMES WATER MANHOLE ON HAMM MOOR LANE. THE CONNECTION IS SUBJECT TO SECTION 106 AGREEMENT.

LEGEND

- SITE BOUNDARY
- EXISTING THAMES WATER SURFACE WATER DRAIN WITH MANHOLE
- EXISTING THAMES WATER FOUL WATER DRAIN WITH MANHOLE
- NEW FOUL WATER DRAIN WITH MANHOLE
- NEW SURFACE WATER DRAIN WITH MANHOLE
- NEW SURFACE WATER MANHOLE WITH VENTED COVER
- FLOW REGULATOR
- LINEAR DRAINAGE CHANNEL
- BELOW GROUND ATTENUATION TANK
- PETROL INTERCEPTOR
- PRIMARY SIPHONIC DOWNPIPE
- SURFACE WATER RISING MAIN
- PERMEABLE BLOCK PAVING
- EXISTING HEADWALL

DRAINAGE NOTES

1. ALL PRIVATE DRAINAGE WORKS ARE TO BE CARRIED OUT IN ACCORDANCE WITH BS EN 752:2008 AND BUILDING REGULATIONS PART H.
2. ALL DRAINAGE WORKS WITHIN ADOPTABLE AREAS ARE TO COMPLY WITH THE REQUIREMENTS OF THE WATER UK/WATER RESEARCH CENTRE PUBLICATION `SEWERS FOR ADOPTION' (CURRENT EDITION).
3. ALL CONNECTIONS TO EXISTING PUBLIC SEWERS TO BE IN ACCORDANCE WITH AND TO THE SATISFACTION OF THE LOCAL AUTHORITY.
4. CONCRETE PROTECTION (BEDDING CLASS `Z') TO PIPEWORK TO BE PROVIDED AS FOLLOWS;
(I) ALL PIPEWORK WITHIN SOFT AREAS WITH A COVER OF LESS THAN 600mm.
(II) ALL PIPEWORK BENEATH ROADS, CAR PARKS AND ALL OTHER TRAFFICKED HARDSTANDING AREAS WITH A COVER LESS THAN 1200mm.
(III) ALL PIPEWORK ADJACENT TO EXISTING AND PROPOSED TREES/DENSE VEGETATION IN LANDSCAPED AREAS.
AN EXPANSION JOINT SHALL BE PROVIDED AT ALL JOINT LOCATIONS.
5. ALL BELOW GROUND FOUL DRAINAGE FROM WITHIN BUILDING FOOTPRINT TO BE 100mm DIA. UNLESS STATED OTHERWISE. REFER TO SEPARATE NOTE FOR RECOMMENDED MINIMUM GRADIENTS.
ALL BELOW GROUND SURFACE WATER DRAINAGE FROM RWP LOCATIONS TO MAIN CARRIER DRAINS TO MATCH THE DIAMETER OF THE DOWNPIPE (TO ARCHITECT'S AND SPECIALIST CONTRACTOR'S DETAILS) UNLESS STATED OTHERWISE.
ALL BELOW GROUND DRAINAGE FROM ROAD GULLIES TO BE 150mm DIA. UNLESS STATED OTHERWISE.
6. ALL PIPEWORK IN MANHOLES ARE TO BE LAID SOFFIT TO SOFFIT UNLESS NOTED OTHERWISE. ALL CHAMBER INVERT LEVELS, SHOWN ON THE DRAWING, ARE FOR THE OUTGOING PIPE.
7. ALL INTERNAL DRAINAGE TO BE TO THE ARCHITECT'S AND M & E ENGINEER'S DRAWINGS AND DETAILS.
8. THE POSITION AND INVERT LEVELS OF ALL EXISTING DRAINS, SEWERS AND MANHOLES TO BE CONFIRMED BY THE CONTRACTOR PRIOR TO THE COMMENCEMENT OF THE PROPOSED WORKS AND ANY DISCREPANCIES REPORTED IMMEDIATELY TO BRADBROOK CONSULTANTS.
9. ALL PIPES ARE TO HAVE A CLASS `S' BED AND SURROUND UNLESS NOTED OTHERWISE (SEE NOTE 4 ABOVE).
10. ALL CONCRETE PIPES ARE TO BE HIGH STRENGTH AND TO BE IN ACCORDANCE WITH BS EN 1916 AND BS 5911.
11. ALL VITRIFIED CLAY PIPES ARE TO BE IN ACCORDANCE WITH BS EN 295.
12. FOR SETTING OUT OF FOUL AND RAINWATER OUTLETS REFER TO THE ARCHITECT'S DRAWINGS.
13. THIS DRAWING TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT ENGINEER'S AND ARCHITECT'S DRAWINGS, SPECIFICATIONS AND DOCUMENTATION.
14. THE CONTRACTOR IS TO ALLOW FOR GREASE TRAPS IN THE KITCHEN AND OTHER APPROPRIATE AREAS.
15. DRAINAGE CHANNELS AND SILT PITS TO BE DESIGNED BY A SPECIALIST MANUFACTURER FOR CRITICAL STORMS OF 1:5 YEAR RETURN PERIOD, TO SUIT SITE CONDITIONS AND IN ACCORDANCE WITH LOAD CLASS REQUIREMENTS AS SHOWN ON THE PLAN.
DESIGN TO BE SUBMITTED FOR COMMENT TO PRIOR TO ORDERING.
16. ALL EXTERNAL FINISHED LEVELS AND MANHOLE COVER LEVELS SHOWN ON THIS DRAWING ARE INDICATIVE AND SUBJECT TO ADJUSTMENT ON SITE TO SUIT THE FINISHED GROUND LEVELS. FOR FINAL LEVELS REFER TO THE ARCHITECT'S DRAWINGS.
17. ALL LEVELS ARE IN METRES AND ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.
18. ANY COORDINATES PROVIDED FOR MANHOLES OR INSPECTION CHAMBERS ARE RELEVANT TO THE MAIN DRAINAGE RUN INTERSECTION AND NOT THE CENTRE OF THE MANHOLE.
19. CHALK AND LIMESTONE ARE NOT TO BE USED AS BEDDING OR BACKFILLING MATERIAL IN SOILS WITH A PH VALUE LESS THAN 7.
20. A CCTV DRAINAGE SURVEY IS TO BE CARRIED OUT BOTH AT THE PRE-COMMENCEMENT OF CONSTRUCTION AND AT THE COMPLETION OF THE CONTRACT TO PROVE THE INTEGRITY OF THE AS-BUILT DRAINAGE SYSTEMS. AT THE COMPLETION OF THE CONTRACT THIS IS TO BE CARRIED OUT PRIOR TO THE ISSUE OF THE PRACTICAL COMPLETION CERTIFICATE.
21. SEWERS, MANHOLES, GULLIES, DRAINAGE CHANNELS AND SILT PITS SHOULD BE INSPECTED AT 6 MONTHLY INTERVALS AND CLEANED OUT AT 12 MONTHLY INTERVALS. A FULL CCTV SURVEY SHOULD ALSO BE CARRIED OUT AT 10 YEARLY INTERVALS. REFER ALSO TO SPECIALIST DRAINAGE CHANNEL AND PETROL INTERCEPTOR MANUFACTURER'S INFORMATION AND MAINTENANCE REQUIREMENTS.
IN ALL INSTANCES, INSPECTION AND CLEANING SHOULD BE CARRIED OUT ONLY BY A SPECIALIST CONTRACTOR AND IN ACCORDANCE WITH THE GUIDELINES GIVEN IN `SAFE WORKING IN SEWERS AND AT SEWAGE WORKS' PUBLISHED BY NATIONAL JOINT HEALTH AND SAFETY COMMITTEE FOR THE WATER SERVICES.

IMPORTANT NOTE:
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FOR NEW CONSTRUCTION, COLUMN FOUNDATIONS/STRIP FOOTINGS MUST BE TAKEN DOWN TO BELOW INVERT LEVEL OF ANY NEARBY, ADJACENT SERVICES (DRAINAGE, GAS, WATER, ETC.)

USE OF THERMOPLASTIC PIPES
IF THERMOPLASTIC PIPES ARE TO BE USED THEY ARE TO BE OF THE STRUCTURED WALL TYPE AND SHALL COMPLY WITH WIS 4-35-01 AND BS EN 13476 AND MUST BE BSI KITEMARKED (E.G. POLYSEWER/RIDGISEWER BY POLYPIPE CIVILS, ULTRARIB BY WAVIN OR SIMILAR). PIPES ARE TO BE INSTALLED STRICTLY IN ACCORDANCE WITH THE MANUFACTURER'S REQUIREMENTS AND RECOMMENDATIONS. NOTE: ALL INSTALLATION MUST BE IN ACCORDANCE WITH BUILDING REGULATIONS PART: H, BS EN 752:2008, SPECIFICATION FOR HIGHWAY WORKS AND ALL RELEVANT BRITISH AND EUROPEAN CODES OF PRACTICE.

REFER TO THE ARCHITECT'S DETAILS FOR THE INTERNAL, ABOVE GROUND, DRAINAGE LAYOUT.
RECOMMENDED MINIMUM GRADIENTS FOR BELOW GROUND FOUL DRAINAGE CONNECTIONS:
100 DIA. AT 1:40,
100 DIA. AT 1:80 WITH MIN 1 NO. WC CONNECTION,
150 DIA. AT 1:150 WITH MIN 5 NO. WC CONNECTIONS.
FINAL FOUL DRAINAGE CONNECTIONS TO BE COORDINATED WITH THE ARCHITECT'S INTERNAL DRAINAGE LAYOUT PLANS.

Rev.	Tech	Date	Description
P1	JJ	27.04.22	PRELIMINARY ISSUE.

HDR | Bradbrook Consulting
Berkhamsted Office
Bourne House
Prince Edward Street
Berkhamsted
Herts, HP4 3EZ
United Kingdom
T: +44 (0)20 8669 1903
E: info@bradbrookconsulting.com
W: www.bradbrookconsulting.com

Client: BRIDGE

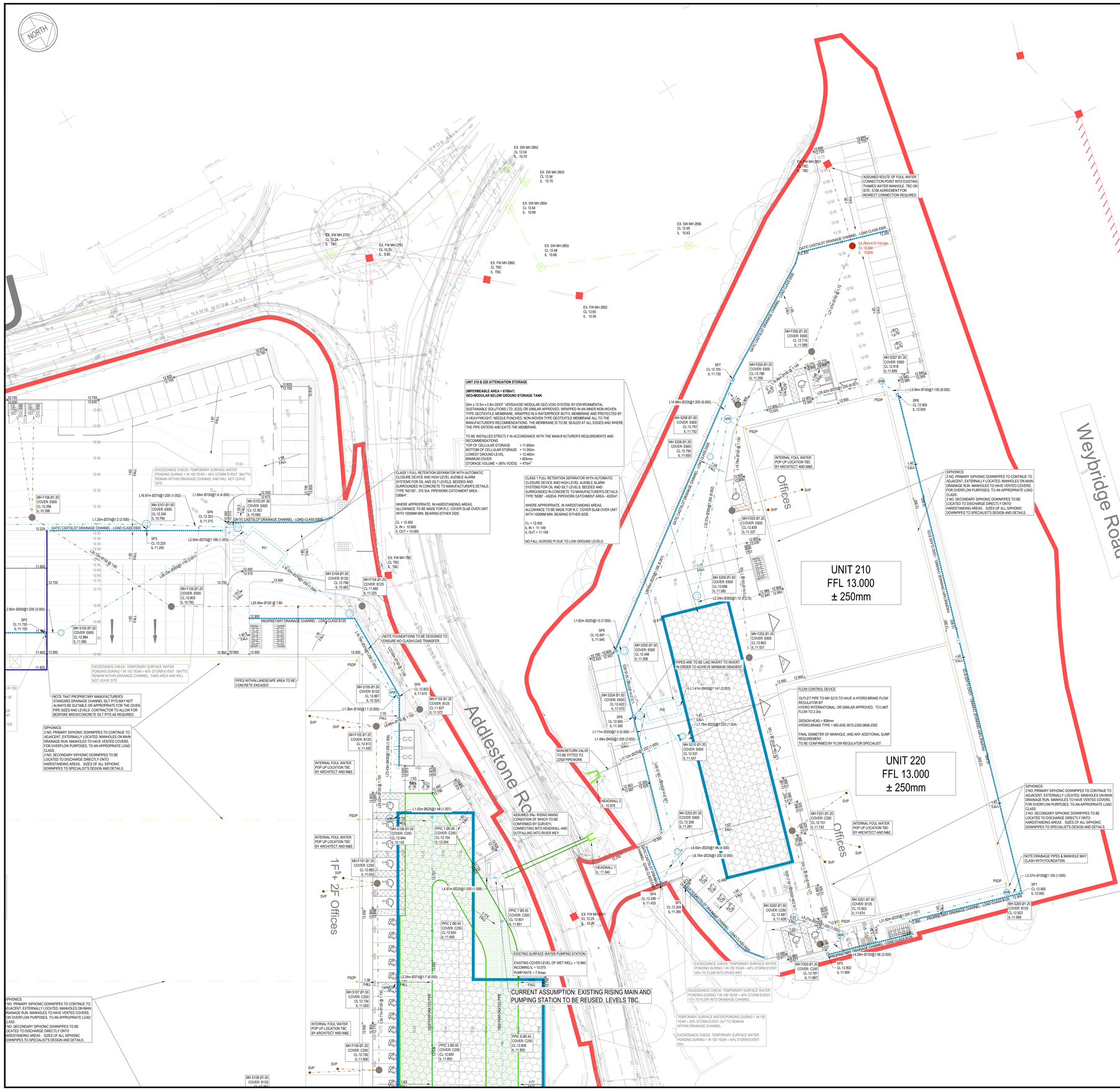
Project Title: **WEYBRIDGE BUSINESS PARK, WEYBRIDGE**

Drawing Title: **DRAINAGE LAYOUT AND EXTERNAL LEVELS**
SHEET 1 OF 2

Purpose of Issue: Information ○ Preliminary ● Approval ○ Tender ○ Construction ○ Record Copy ○

First Issue Date	Drawn By	Scale	Checked
APRIL 22	JJ	1 : 250 @ A0	NDH

Drawing Number	Rev.
10334617-HDR-XX-XX-DR-C-300	P1



DRAINAGE NOTES

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REFER TO THE ARCHITECT'S DETAILS FOR THE INTERNAL, ABOVE GROUND, DRAINAGE LAYOUT.
RECOMMENDED MINIMUM GRADIENTS FOR BELOW GROUND FOUL DRAINAGE CONNECTIONS:
100 DIA. AT 1:40,
100 DIA. AT 1:80 WITH MIN 1 NO. WC CONNECTION,
150 DIA. AT 1:150 WITH MIN 5 NO. WC CONNECTIONS.
FINAL FOUL DRAINAGE CONNECTIONS TO BE COORDINATED WITH THE ARCHITECT'S INTERNAL DRAINAGE LAYOUT PLANS.

SURFACE WATER DRAINAGE STRATEGY UNIT 210 & 220
THE SURFACE WATER DRAINAGE STRATEGY IS TO DISCHARGE VIA GRAVITY INTO RIVER WEY LOCATED NORTH OF THE SITE AT GREENFIELD QBAR DISCHARGE RATE OF 3.4 l/s/ha.

SURFACE WATER DRAINS THOUGH PETROL INTERCEPTORS PRIOR TO ENTERING THE ATTENUATION TANK.

SURFACE WATER IS PROPOSED TO BE DISCHARGED INTO RIVER WEY VIA AN EXISTING HEADWALL LOCATED NORTH OF ADDLESTONE ROAD. THE SURFACE WATER IS TO DISCHARGE AT A CONTROLLED RATE OF 2.3l/sec.

FOUL WATER DRAINAGE STRATEGY UNIT 210 & 220
THE FOUL WATER DRAINAGE STRATEGY IS TO DRAIN VIA GRAVITY INTO AN EXISTING PRIVATE FOUL WATER MANHOLE LOCATED ON SITE.

THE FINAL DISCHARGE IS AN EXISTING CONNECTION INTO THAMES WATER MANHOLE MH 2801 LOCATED IN THE SITE. THE CONNECTION IS SUBJECT TO SECTION 106 AGREEMENT.

Rev	Init	Date	Description
P1	JJ	27.04.22	PRELIMINARY ISSUE

Bradbrook Consulting
Berkhamsted Office
Bourne House
Prince Edward Street
Berkhamsted
Herts, HP4 3EZ
United Kingdom
T: +44 (0)20 8869 1903
E: info@bradbrookconsulting.com
W: www.bradbrookconsulting.com

Client: BRIDGE

Project Title: **WEYBRIDGE BUSINESS PARK, WEYBRIDGE**

Drawing Title: **DRAINAGE LAYOUT AND EXTERNAL LEVELS SHEET 2 OF 2**

Purpose of Issue: Information ○ Preliminary ● Approval ○ Tender ○ Construction ○ Record Copy ○

First Issue Date	Drawn By	Scale	Checked
APRIL 22	JJ	1 : 250 @ A0	NDH

Drawing Number: **10334617-HDR-XX-XX-DR-C-301** Rev: **P1**

APPENDIX L

DRAINAGE NETWORK CALCULATIONS

Time Area Diagram for Storm

Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	1.450	4-8	0.543

Total Area Contributing (ha) = 1.993

Total Pipe Volume (m^3) = 18.372

Existing Network Details for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type
1.000	1.600	0.008	200.0	0.089	5.00	0.0	0.600	o	225	Pipe/Conduit
1.001	65.460	0.327	200.2	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit
2.000	1.200	0.485	2.5	0.204	5.00	0.0	0.600	o	375	Pipe/Conduit
1.002	16.970	0.085	199.6	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit
3.000	2.950	0.015	196.7	0.195	5.00	0.0	0.600	o	300	Pipe/Conduit
3.001	38.230	0.330	115.8	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit
4.000	1.840	0.410	4.5	0.039	5.00	0.0	0.600	o	150	Pipe/Conduit
1.003	2.500	0.015	166.7	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit
1.004	16.320	0.082	199.0	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit

Network Results Table

PN	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Vel (m/s)	Cap (l/s)
1.000	11.250	0.089	0.0	0.92	36.6
1.001	11.242	0.089	0.0	0.92	36.6
2.000	11.250	0.204	0.0	11.59	1279.9
1.002	10.765	0.293	0.0	1.28	141.2
3.000	11.100	0.195	0.0	1.12	79.0
3.001	11.085	0.195	0.0	1.46	103.2
4.000	11.315	0.039	0.0	4.79	84.7
1.003	10.680	0.527	0.0	1.40	154.7
1.004	10.565	0.527	0.0	1.28	141.4

Existing Network Details for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type
1.005	16.790	0.084	199.9	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit
5.000	1.360	0.986	1.4	0.033	5.00	0.0	0.600	o	150	Pipe/Conduit
1.006	23.430	0.117	200.3	0.238	5.00	0.0	0.600	o	450	Pipe/Conduit
1.007	1.530	0.212	7.2	0.445	5.00	0.0	0.600	o	525	Pipe/Conduit
6.000	2.240	0.300	7.5	0.452	5.00	0.0	0.600	o	375	Pipe/Conduit
7.000	11.320	0.063	179.7	0.047	5.00	0.0	0.600	o	150	Pipe/Conduit
7.001	23.830	1.087	21.9	0.251	5.00	0.0	0.600	o	300	Pipe/Conduit
8.000	1.000	0.940	1.1	0.000	5.00	0.0	0.600	o	150	Pipe/Conduit

Network Results Table

PN	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Vel (m/s)	Cap (l/s)
1.005	10.483	0.527	0.0	1.28	141.1
5.000	11.610	0.033	0.0	8.65	152.9
1.006	10.324	0.798	0.0	1.43	227.9
1.007	10.312	1.243	0.0	8.37	1812.7
6.000	11.000	0.452	0.0	6.67	736.2
7.000	12.000	0.047	0.0	0.75	13.2
7.001	11.787	0.298	0.0	3.37	238.4
8.000	12.040	0.000	0.0	9.85	174.1

Existing Network Details for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type
9.000	0.800	0.800	1.0	0.000	5.00	0.0	0.600	o	150	Pipe/Conduit
10.000	0.800	0.750	1.1	0.000	5.00	0.0	0.600	o	150	Pipe/Conduit
11.000	0.800	0.750	1.1	0.000	5.00	0.0	0.600	o	150	Pipe/Conduit
12.000	0.800	0.750	1.1	0.000	5.00	0.0	0.600	o	150	Pipe/Conduit
13.000	0.800	0.750	1.1	0.000	5.00	0.0	0.600	o	150	Pipe/Conduit
14.000	0.800	0.751	1.1	0.000	5.00	0.0	0.600	o	150	Pipe/Conduit
1.008	4.970	0.025	198.8	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit
1.009	17.500	-0.965	-18.1	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit

Network Results Table

PN	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Vel (m/s)	Cap (l/s)
9.000	11.900	0.000	0.0	10.16	179.6
10.000	11.850	0.000	0.0	9.84	173.9
11.000	11.850	0.000	0.0	9.84	173.9
12.000	11.850	0.000	0.0	9.84	173.9
13.000	11.850	0.000	0.0	9.84	173.9
14.000	11.851	0.000	0.0	9.85	174.0
1.008	10.100	1.993	0.0	0.92	36.7
1.009	10.075	1.993	0.0	0.00	0.0

Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
SP1	12.225	0.975	Open Manhole	1200	1.000	11.250	225				
MH S100	12.247	1.005	Open Manhole	1200	1.001	11.242	225	1.000	11.242	225	
SP3	12.225	0.975	Open Manhole	1200	2.000	11.250	375				
MH S101	12.245	1.480	Open Manhole	1500	1.002	10.765	375	1.001	10.915	225	
								2.000	10.765	375	
SP2	11.750	0.650	Open Manhole	1200	3.000	11.100	300				
MH S102	12.884	1.799	Open Manhole	1200	3.001	11.085	300	3.000	11.085	300	
SP4	12.353	1.038	Open Manhole	1200	4.000	11.315	150				
MH S103	12.363	1.683	Open Manhole	1500	1.003	10.680	375	1.002	10.680	375	
								3.001	10.755	300	
								4.000	10.905	150	
PI1	12.400	1.835	Open Manhole	1200	1.004	10.565	375	1.003	10.665	375	100
MH S104	12.798	2.315	Open Manhole	1500	1.005	10.483	375	1.004	10.483	375	
SP5	12.853	1.243	Open Manhole	1200	5.000	11.610	150				
MH S105	12.867	2.543	Open Manhole	1500	1.006	10.324	450	1.005	10.399	375	
								5.000	10.624	150	
MH S106	12.844	2.637	Open Manhole	1500	1.007	10.312	525	1.006	10.207	450	
MH S107	12.734	1.734	Open Manhole	1500	6.000	11.000	375				
SP6	12.900	0.900	Open Manhole	1200	7.000	12.000	150				
MH S108	12.392	0.605	Open Manhole	1500	7.001	11.787	300	7.000	11.937	150	
PPIC1	12.754	0.714	Open Manhole	1200	8.000	12.040	150				
PPIC2	12.650	0.750	Open Manhole	1200	9.000	11.900	150				
PPIC3	12.600	0.750	Open Manhole	1200	10.000	11.850	150				
PPIC4	12.600	0.750	Open Manhole	1200	11.000	11.850	150				
PPIC5	12.600	0.750	Open Manhole	1200	12.000	11.850	150				

Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
PPIC6	12.600	0.750	Open Manhole	1200	13.000	11.850	150				
PPIC7	12.600	0.749	Open Manhole	1200	14.000	11.851	150				
TANK	12.600	2.500	Open Manhole	1200	1.008	10.100	225	1.007	10.100	525	
								6.000	10.700	375	750
								7.001	10.700	300	675
								8.000	11.100	150	925
								9.000	11.100	150	925
								10.000	11.100	150	925
								11.000	11.100	150	925
								12.000	11.100	150	925
								13.000	11.100	150	925
								14.000	11.100	150	925
PS	12.840	2.765	Open Manhole	1200	1.009	10.075	150	1.008	10.075	225	
HW1	12.400	1.360	Open Manhole	0		OUTFALL		1.009	11.040	150	

No coordinates have been specified, layout information cannot be produced.

PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	o	225	SP1	12.225	11.250	0.750	Open Manhole	1200
1.001	o	225	MH S100	12.247	11.242	0.780	Open Manhole	1200
2.000	o	375	SP3	12.225	11.250	0.600	Open Manhole	1200
1.002	o	375	MH S101	12.245	10.765	1.105	Open Manhole	1500
3.000	o	300	SP2	11.750	11.100	0.350	Open Manhole	1200
3.001	o	300	MH S102	12.884	11.085	1.499	Open Manhole	1200
4.000	o	150	SP4	12.353	11.315	0.888	Open Manhole	1200
1.003	o	375	MH S103	12.363	10.680	1.308	Open Manhole	1500

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	1.600	200.0	MH S100	12.247	11.242	0.780	Open Manhole	1200
1.001	65.460	200.2	MH S101	12.245	10.915	1.105	Open Manhole	1500
2.000	1.200	2.5	MH S101	12.245	10.765	1.105	Open Manhole	1500
1.002	16.970	199.6	MH S103	12.363	10.680	1.308	Open Manhole	1500
3.000	2.950	196.7	MH S102	12.884	11.085	1.499	Open Manhole	1200
3.001	38.230	115.8	MH S103	12.363	10.755	1.308	Open Manhole	1500
4.000	1.840	4.5	MH S103	12.363	10.905	1.308	Open Manhole	1500
1.003	2.500	166.7	PI1	12.400	10.665	1.360	Open Manhole	1200

PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.004	o	375	PI1	12.400	10.565	1.460	Open Manhole	1200
1.005	o	375	MH S104	12.798	10.483	1.940	Open Manhole	1500
5.000	o	150	SP5	12.853	11.610	1.093	Open Manhole	1200
1.006	o	450	MH S105	12.867	10.324	2.093	Open Manhole	1500
1.007	o	525	MH S106	12.844	10.312	2.007	Open Manhole	1500
6.000	o	375	MH S107	12.734	11.000	1.359	Open Manhole	1500
7.000	o	150	SP6	12.900	12.000	0.750	Open Manhole	1200
7.001	o	300	MH S108	12.392	11.787	0.305	Open Manhole	1500

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.004	16.320	199.0	MH S104	12.798	10.483	1.940	Open Manhole	1500
1.005	16.790	199.9	MH S105	12.867	10.399	2.093	Open Manhole	1500
5.000	1.360	1.4	MH S105	12.867	10.624	2.093	Open Manhole	1500
1.006	23.430	200.3	MH S106	12.844	10.207	2.187	Open Manhole	1500
1.007	1.530	7.2	TANK	12.600	10.100	1.975	Open Manhole	1200
6.000	2.240	7.5	TANK	12.600	10.700	1.525	Open Manhole	1200
7.000	11.320	179.7	MH S108	12.392	11.937	0.305	Open Manhole	1500
7.001	23.830	21.9	TANK	12.600	10.700	1.600	Open Manhole	1200

PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
8.000	o	150	PPIC1	12.754	12.040	0.564	Open Manhole	1200
9.000	o	150	PPIC2	12.650	11.900	0.600	Open Manhole	1200
10.000	o	150	PPIC3	12.600	11.850	0.600	Open Manhole	1200
11.000	o	150	PPIC4	12.600	11.850	0.600	Open Manhole	1200
12.000	o	150	PPIC5	12.600	11.850	0.600	Open Manhole	1200
13.000	o	150	PPIC6	12.600	11.850	0.600	Open Manhole	1200
14.000	o	150	PPIC7	12.600	11.851	0.599	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
8.000	1.000	1.1	TANK	12.600	11.100	1.350	Open Manhole	1200
9.000	0.800	1.0	TANK	12.600	11.100	1.350	Open Manhole	1200
10.000	0.800	1.1	TANK	12.600	11.100	1.350	Open Manhole	1200
11.000	0.800	1.1	TANK	12.600	11.100	1.350	Open Manhole	1200
12.000	0.800	1.1	TANK	12.600	11.100	1.350	Open Manhole	1200
13.000	0.800	1.1	TANK	12.600	11.100	1.350	Open Manhole	1200
14.000	0.800	1.1	TANK	12.600	11.100	1.350	Open Manhole	1200

PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.008	o	225	TANK	12.600	10.100	2.275	Open Manhole	1200
1.009	o	150	PS	12.840	10.075	2.615	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.008	4.970	198.8	PS	12.840	10.075	2.540	Open Manhole	1200
1.009	17.500	-18.1	HW1	12.400	11.040	1.210	Open Manhole	0

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1.009	HW1	12.400	11.040	0.000	0	0

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Manhole Headloss Coeff (Global)	0.500	Inlet Coeffiecient	0.800
Areal Reduction Factor	1.000	Foul Sewage per hectare (l/s)	0.000	Flow per Person per Day (l/per/day)	0.000
Hot Start (mins)	0	Additional Flow - % of Total Flow	0.000	Run Time (mins)	60
Hot Start Level (mm)	0	MADD Factor * 10m³/ha Storage	2.000	Output Interval (mins)	1

Number of Input Hydrographs	0	Number of Offline Controls	0	Number of Time/Area Diagrams	7
Number of Online Controls	1	Number of Storage Structures	1	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FEH	Summer Storms	Yes
Return Period (years)	100	Winter Storms	Yes
FEH Rainfall Version	2013	Cv (Summer)	0.750
Site Location	GB 506317 164697 TQ 06317 64697	Cv (Winter)	0.840
Data Type	Point	Storm Duration (mins)	30

Online Controls for Storm

Pump Manhole: PS, DS/PN: 1.009, Volume (m³): 3.3

Invert Level (m) 10.075

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.200	7.5000	1.200	7.5000	2.200	7.5000	3.200	7.5000	4.200	7.5000	5.200	7.5000
0.400	7.5000	1.400	7.5000	2.400	7.5000	3.400	7.5000	4.400	7.5000	5.400	7.5000
0.600	7.5000	1.600	7.5000	2.600	7.5000	3.600	7.5000	4.600	7.5000	5.600	7.5000
0.800	7.5000	1.800	7.5000	2.800	7.5000	3.800	7.5000	4.800	7.5000	5.800	7.5000
1.000	7.5000	2.000	7.5000	3.000	7.5000	4.000	7.5000	5.000	7.5000	6.000	7.5000

Storage Structures for Storm

Complex Manhole: TANK, DS/PN: 1.008

Cellular Storage

Invert Level (m) 10.100 Infiltration Coefficient Side (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Base (m/hr) 0.00000 Safety Factor 2.0

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	1433.0	0.0	1.000	1433.0	0.0	1.001	0.0	0.0

Porous Car Park

Infiltration Coefficient Base (m/hr)	0.00000	Porosity	0.30	Slope (1:X)	65.0
Membrane Percolation (mm/hr)	1000	Invert Level (m)	12.100	Depression Storage (mm)	5
Max Percolation (l/s)	43.0	Width (m)	24.2	Evaporation (mm/day)	3
Safety Factor	2.0	Length (m)	6.4	Membrane Depth (mm)	0

Porous Car Park

Infiltration Coefficient Base (m/hr)	0.00000	Porosity	0.30	Slope (1:X)	63.0
Membrane Percolation (mm/hr)	1000	Invert Level (m)	12.100	Depression Storage (mm)	5
Max Percolation (l/s)	113.3	Width (m)	68.0	Evaporation (mm/day)	3
Safety Factor	2.0	Length (m)	6.0	Membrane Depth (mm)	0

Porous Car Park

Infiltration Coefficient Base (m/hr)	0.00000	Porosity	0.30	Slope (1:X)	0.0
Membrane Percolation (mm/hr)	1000	Invert Level (m)	12.100	Depression Storage (mm)	5
Max Percolation (l/s)	144.4	Width (m)	8.0	Evaporation (mm/day)	3
Safety Factor	2.0	Length (m)	65.0	Membrane Depth (mm)	0

Time Area Diagram at Pipe Number 8.000 for Storm

Total Area (ha) 0.038

Time From: (mins)	To:	Area (ha)	Time From: (mins)	To:	Area (ha)
0	4	0.019	4	8	0.019

Time Area Diagram at Pipe Number 9.000 for Storm

Total Area (ha) 0.038

Time From: (mins)	To:	Area (ha)	Time From: (mins)	To:	Area (ha)
0	4	0.019	4	8	0.019

Time Area Diagram at Pipe Number 10.000 for Storm

Total Area (ha) 0.038

Time From: (mins)	To:	Area (ha)	Time From: (mins)	To:	Area (ha)
0	4	0.019	4	8	0.019

Time Area Diagram at Pipe Number 11.000 for Storm

Total Area (ha) 0.038

Time From: (mins)	To:	Area (ha)	Time From: (mins)	To:	Area (ha)
0	4	0.019	4	8	0.019

Time Area Diagram at Pipe Number 12.000 for Storm

Total Area (ha) 0.038

Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)
0	4	0.019	4	8	0.019

Time Area Diagram at Pipe Number 13.000 for Storm

Total Area (ha) 0.038

Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)
0	4	0.019	4	8	0.019

Time Area Diagram at Pipe Number 14.000 for Storm

Total Area (ha) 0.038

Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)
0	4	0.019	4	8	0.019

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

Simulation Criteria

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

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 7
Number of Online Controls 1 Number of Storage Structures 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FEH Data Type Point
FEH Rainfall Version 2013 Cv (Summer) 0.750
Site Location GB 506317 164697 TQ 06317 64697 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep 2.5 Second Increment (Extended) Inertia Status OFF
DTS Status ON

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years) 2, 30, 100
Climate Change (%) 0, 0, 20

WARNING: Half Drain Time has not been calculated as the structure is too full.

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SP1	15 Winter	2	+0%	30/15 Summer	100/15 Winter			11.360	-0.115	0.000	0.47			14.1	OK
1.001	MH S100	15 Winter	2	+0%	30/15 Summer				11.342	-0.125	0.000	0.38			13.4	OK
2.000	SP3	15 Winter	2	+0%	100/15 Summer				11.336	-0.289	0.000	0.12			32.6	OK
1.002	MH S101	15 Winter	2	+0%	30/15 Summer				10.994	-0.146	0.000	0.39			44.4	OK
3.000	SP2	15 Winter	2	+0%	30/15 Summer	100/15 Summer			11.270	-0.130	0.000	0.60			30.8	OK

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

PN	US/MH Name	Level Exceeded
1.000	SP1	1
1.001	MH S100	
2.000	SP3	
1.002	MH S101	
3.000	SP2	20

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
3.001	MH S102	15 Winter	2	+0%	30/15 Summer				11.203	-0.182	0.000	0.32			30.8	OK
4.000	SP4	15 Winter	2	+0%	30/15 Summer				11.355	-0.110	0.000	0.16			6.2	OK
1.003	MH S103	15 Winter	2	+0%	30/15 Summer				10.969	-0.086	0.000	0.94			80.3	OK
1.004	PI1	15 Winter	2	+0%	30/15 Summer				10.802	-0.138	0.000	0.72			80.6	OK
1.005	MH S104	15 Winter	2	+0%	30/15 Summer				10.717	-0.141	0.000	0.71			80.2	OK
5.000	SP5	15 Winter	2	+0%	100/240 Winter				11.639	-0.121	0.000	0.08			5.3	OK
1.006	MH S105	15 Winter	2	+0%	30/15 Summer				10.629	-0.145	0.000	0.62			116.6	OK
1.007	MH S106	15 Winter	2	+0%	30/15 Summer				10.580	-0.257	0.000	0.50			176.9	OK
6.000	MH S107	15 Winter	2	+0%	100/15 Summer				11.151	-0.224	0.000	0.34			72.2	OK
7.000	SP6	15 Winter	2	+0%	30/15 Summer				12.088	-0.062	0.000	0.63			7.4	OK
7.001	MH S108	15 Winter	2	+0%	100/480 Winter				11.884	-0.203	0.000	0.22			47.3	OK
8.000	PPIC1	15 Winter	2	+0%					12.068	-0.122	0.000	0.08			4.8	OK
9.000	PPIC2	15 Winter	2	+0%	100/360 Winter				11.929	-0.121	0.000	0.09			4.8	OK
10.000	PPIC3	15 Winter	2	+0%	100/240 Winter				11.880	-0.120	0.000	0.09			4.8	OK
11.000	PPIC4	15 Winter	2	+0%	100/240 Winter				11.880	-0.120	0.000	0.09			4.8	OK
12.000	PPIC5	15 Winter	2	+0%	100/240 Winter				11.880	-0.120	0.000	0.09			4.8	OK
13.000	PPIC6	15 Winter	2	+0%	100/240 Winter				11.880	-0.120	0.000	0.09			4.8	OK
14.000	PPIC7	15 Winter	2	+0%	100/240 Winter				11.881	-0.120	0.000	0.09			4.8	OK
1.008	TANK	480 Winter	2	+0%	2/120 Winter				10.437	0.112	0.000	0.35			9.5	SURCHARGED
1.009	PS	600 Winter	2	+0%	2/30 Summer				10.471	0.246	0.000	1.72			7.5	SURCHARGED

PN	US/MH Name	Level Exceeded
3.001	MH S102	
4.000	SP4	
1.003	MH S103	
1.004	PI1	
1.005	MH S104	
5.000	SP5	
1.006	MH S105	

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

PN	US/MH Name	Level Exceeded
1.007	MH S106	
6.000	MH S107	
7.000	SP6	
7.001	MH S108	
8.000	PPIC1	
9.000	PPIC2	
10.000	PPIC3	
11.000	PPIC4	
12.000	PPIC5	
13.000	PPIC6	
14.000	PPIC7	
1.008	TANK	
1.009	PS	

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

Simulation Criteria

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

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 7
Number of Online Controls 1 Number of Storage Structures 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FEH Data Type Point
FEH Rainfall Version 2013 Cv (Summer) 0.750
Site Location GB 506317 164697 TQ 06317 64697 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep 2.5 Second Increment (Extended) Inertia Status OFF
DTS Status ON

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years) 2, 30, 100
Climate Change (%) 0, 0, 20

WARNING: Half Drain Time has not been calculated as the structure is too full.

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
1.000	SP1	15 Winter	30	+0%	30/15 Summer	100/15 Winter			11.817	0.342	0.000	0.99			29.5
1.001	MH S100	15 Winter	30	+0%	30/15 Summer				11.801	0.334	0.000	0.76			27.0
2.000	SP3	15 Winter	30	+0%	100/15 Summer				11.621	-0.004	0.000	0.27			74.7
1.002	MH S101	15 Winter	30	+0%	30/15 Summer				11.611	0.471	0.000	0.79			90.1
3.000	SP2	15 Winter	30	+0%	30/15 Summer	100/15 Summer			11.720	0.320	0.000	1.23			62.8

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

PN	US/MH Name	Status	Level Exceeded
1.000	SP1	SURCHARGED	1
1.001	MH S100	SURCHARGED	
2.000	SP3	OK	
1.002	MH S101	SURCHARGED	
3.000	SP2	FLOOD RISK	20

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
3.001	MH S102	15 Winter	30	+0%	30/15 Summer				11.692	0.307	0.000	0.63			60.6	SURCHARGED
4.000	SP4	15 Winter	30	+0%	30/15 Summer				11.598	0.133	0.000	0.36			14.3	SURCHARGED
1.003	MH S103	15 Winter	30	+0%	30/15 Summer				11.560	0.505	0.000	1.93			163.9	SURCHARGED
1.004	PI1	15 Winter	30	+0%	30/15 Summer				11.398	0.458	0.000	1.49			166.7	SURCHARGED
1.005	MH S104	15 Winter	30	+0%	30/15 Summer				11.244	0.386	0.000	1.50			170.3	SURCHARGED
5.000	SP5	15 Winter	30	+0%	100/240 Winter				11.657	-0.103	0.000	0.21			13.3	OK
1.006	MH S105	15 Winter	30	+0%	30/15 Summer				11.096	0.322	0.000	1.30			246.8	SURCHARGED
1.007	MH S106	15 Winter	30	+0%	30/15 Summer				10.892	0.055	0.000	1.15			406.5	SURCHARGED
6.000	MH S107	15 Winter	30	+0%	100/15 Summer				11.268	-0.107	0.000	0.84			180.7	OK
7.000	SP6	15 Winter	30	+0%	30/15 Summer				12.238	0.088	0.000	1.56			18.5	SURCHARGED
7.001	MH S108	15 Winter	30	+0%	100/480 Winter				11.949	-0.138	0.000	0.56			117.7	OK
8.000	PPIC1	15 Winter	30	+0%					12.085	-0.105	0.000	0.20			12.1	OK
9.000	PPIC2	15 Winter	30	+0%	100/360 Winter				11.947	-0.103	0.000	0.22			12.1	OK
10.000	PPIC3	15 Winter	30	+0%	100/240 Winter				11.898	-0.102	0.000	0.22			12.1	OK
11.000	PPIC4	15 Winter	30	+0%	100/240 Winter				11.898	-0.102	0.000	0.22			12.1	OK
12.000	PPIC5	15 Winter	30	+0%	100/240 Winter				11.898	-0.102	0.000	0.22			12.1	OK
13.000	PPIC6	15 Winter	30	+0%	100/240 Winter				11.898	-0.102	0.000	0.22			12.1	OK
14.000	PPIC7	15 Winter	30	+0%	100/240 Winter				11.899	-0.102	0.000	0.22			12.1	OK
1.008	TANK	600 Winter	30	+0%	2/120 Winter				10.846	0.521	0.000	0.35			9.4	SURCHARGED
1.009	PS	720 Winter	30	+0%	2/30 Summer				10.871	0.646	0.000	1.72			7.5	SURCHARGED

PN	US/MH Name	Level Exceeded
3.001	MH S102	
4.000	SP4	
1.003	MH S103	
1.004	PI1	
1.005	MH S104	
5.000	SP5	
1.006	MH S105	

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

PN	US/MH Name	Level Exceeded
1.007	MH S106	
6.000	MH S107	
7.000	SP6	
7.001	MH S108	
8.000	PPIC1	
9.000	PPIC2	
10.000	PPIC3	
11.000	PPIC4	
12.000	PPIC5	
13.000	PPIC6	
14.000	PPIC7	
1.008	TANK	
1.009	PS	

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

Simulation Criteria

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

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 7
Number of Online Controls 1 Number of Storage Structures 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FEH Data Type Point
FEH Rainfall Version 2013 Cv (Summer) 0.750
Site Location GB 506317 164697 TQ 06317 64697 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep 2.5 Second Increment (Extended) Inertia Status OFF
DTS Status ON

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years) 2, 30, 100
Climate Change (%) 0, 0, 20

WARNING: Half Drain Time has not been calculated as the structure is too full.

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
1.000	SP1	15 Winter	100	+20%	30/15 Summer	100/15 Winter			12.227	0.752	1.979	1.49			44.5
1.001	MH S100	15 Winter	100	+20%	30/15 Summer				12.209	0.742	0.000	1.23			43.5
2.000	SP3	15 Winter	100	+20%	100/15 Summer				12.110	0.485	0.000	0.44			119.5
1.002	MH S101	960 Winter	100	+20%	30/15 Summer				12.085	0.945	0.000	0.11			12.1
3.000	SP2	960 Winter	100	+20%	30/15 Summer	100/15 Summer			12.071	0.671	321.277	0.16			8.0

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

PN	US/MH Name	Status	Level Exceeded
1.000	SP1	FLOOD	1
1.001	MH S100	FLOOD RISK	
2.000	SP3	FLOOD RISK	
1.002	MH S101	FLOOD RISK	
3.000	SP2	FLOOD	20

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
3.001	MH S102	960 Winter	100	+20%	30/15 Summer				12.074	0.689	0.000	0.08			8.0	SURCHARGED
4.000	SP4	720 Winter	100	+20%	30/15 Summer				12.083	0.618	0.000	0.05			2.0	FLOOD RISK
1.003	MH S103	960 Winter	100	+20%	30/15 Summer				12.085	1.030	0.000	0.25			21.7	FLOOD RISK
1.004	PI1	960 Winter	100	+20%	30/15 Summer				12.087	1.147	0.000	0.19			21.7	SURCHARGED
1.005	MH S104	720 Winter	100	+20%	30/15 Summer				12.093	1.235	0.000	0.24			27.5	SURCHARGED
5.000	SP5	720 Winter	100	+20%	100/240 Winter				12.099	0.339	0.000	0.03			1.7	SURCHARGED
1.006	MH S105	720 Winter	100	+20%	30/15 Summer				12.099	1.325	0.000	0.22			41.3	SURCHARGED
1.007	MH S106	600 Winter	100	+20%	30/15 Summer				12.103	1.266	0.000	0.21			74.0	SURCHARGED
6.000	MH S107	600 Winter	100	+20%	100/15 Summer				12.110	0.735	0.000	0.13			27.5	SURCHARGED
7.000	SP6	15 Winter	100	+20%	30/15 Summer				12.448	0.298	0.000	2.40			28.6	SURCHARGED
7.001	MH S108	600 Winter	100	+20%	100/480 Winter				12.116	0.029	0.000	0.09			18.1	FLOOD RISK
8.000	PPIC1	600 Winter	100	+20%					12.109	-0.081	0.000	0.04			2.3	OK
9.000	PPIC2	600 Winter	100	+20%	100/360 Winter				12.109	0.059	0.000	0.04			2.3	SURCHARGED
10.000	PPIC3	600 Winter	100	+20%	100/240 Winter				12.109	0.109	0.000	0.04			2.3	SURCHARGED
11.000	PPIC4	600 Winter	100	+20%	100/240 Winter				12.109	0.109	0.000	0.04			2.3	SURCHARGED
12.000	PPIC5	600 Winter	100	+20%	100/240 Winter				12.109	0.109	0.000	0.04			2.3	SURCHARGED
13.000	PPIC6	600 Winter	100	+20%	100/240 Winter				12.109	0.109	0.000	0.04			2.3	SURCHARGED
14.000	PPIC7	600 Winter	100	+20%	100/240 Winter				12.109	0.108	0.000	0.04			2.3	SURCHARGED
1.008	TANK	600 Winter	100	+20%	2/120 Winter				12.108	1.783	0.000	0.40			10.6	SURCHARGED
1.009	PS	600 Winter	100	+20%	2/30 Summer				12.145	1.920	0.000	1.72			7.5	SURCHARGED

PN	US/MH Name	Level Exceeded
3.001	MH S102	
4.000	SP4	
1.003	MH S103	
1.004	PI1	
1.005	MH S104	
5.000	SP5	
1.006	MH S105	

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

PN	US/MH Name	Level Exceeded
1.007	MH S106	
6.000	MH S107	
7.000	SP6	
7.001	MH S108	
8.000	PPIC1	
9.000	PPIC2	
10.000	PPIC3	
11.000	PPIC4	
12.000	PPIC5	
13.000	PPIC6	
14.000	PPIC7	
1.008	TANK	
1.009	PS	

Time Area Diagram for Storm

Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	1.450	4-8	0.543

Total Area Contributing (ha) = 1.993

Total Pipe Volume (m^3) = 18.372

Existing Network Details for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type
1.000	1.600	0.008	200.0	0.089	5.00	0.0	0.600	o	225	Pipe/Conduit
1.001	65.460	0.327	200.2	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit
2.000	1.200	0.485	2.5	0.204	5.00	0.0	0.600	o	375	Pipe/Conduit
1.002	16.970	0.085	199.6	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit
3.000	2.950	0.015	196.7	0.195	5.00	0.0	0.600	o	300	Pipe/Conduit
3.001	38.230	0.330	115.8	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit
4.000	1.840	0.410	4.5	0.039	5.00	0.0	0.600	o	150	Pipe/Conduit
1.003	2.500	0.015	166.7	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit
1.004	16.320	0.082	199.0	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit

Network Results Table

PN	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Vel (m/s)	Cap (l/s)
1.000	11.250	0.089	0.0	0.92	36.6
1.001	11.242	0.089	0.0	0.92	36.6
2.000	11.250	0.204	0.0	11.59	1279.9
1.002	10.765	0.293	0.0	1.28	141.2
3.000	11.100	0.195	0.0	1.12	79.0
3.001	11.085	0.195	0.0	1.46	103.2
4.000	11.315	0.039	0.0	4.79	84.7
1.003	10.680	0.527	0.0	1.40	154.7
1.004	10.565	0.527	0.0	1.28	141.4

Existing Network Details for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type
1.005	16.790	0.084	199.9	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit
5.000	1.360	0.986	1.4	0.033	5.00	0.0	0.600	o	150	Pipe/Conduit
1.006	23.430	0.117	200.3	0.238	5.00	0.0	0.600	o	450	Pipe/Conduit
1.007	1.530	0.212	7.2	0.445	5.00	0.0	0.600	o	525	Pipe/Conduit
6.000	2.240	0.300	7.5	0.452	5.00	0.0	0.600	o	375	Pipe/Conduit
7.000	11.320	0.063	179.7	0.047	5.00	0.0	0.600	o	150	Pipe/Conduit
7.001	23.830	1.087	21.9	0.251	5.00	0.0	0.600	o	300	Pipe/Conduit
8.000	1.000	0.940	1.1	0.000	5.00	0.0	0.600	o	150	Pipe/Conduit

Network Results Table

PN	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Vel (m/s)	Cap (l/s)
1.005	10.483	0.527	0.0	1.28	141.1
5.000	11.610	0.033	0.0	8.65	152.9
1.006	10.324	0.798	0.0	1.43	227.9
1.007	10.312	1.243	0.0	8.37	1812.7
6.000	11.000	0.452	0.0	6.67	736.2
7.000	12.000	0.047	0.0	0.75	13.2
7.001	11.787	0.298	0.0	3.37	238.4
8.000	12.040	0.000	0.0	9.85	174.1

Existing Network Details for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type
9.000	0.800	0.800	1.0	0.000	5.00	0.0	0.600	o	150	Pipe/Conduit
10.000	0.800	0.750	1.1	0.000	5.00	0.0	0.600	o	150	Pipe/Conduit
11.000	0.800	0.750	1.1	0.000	5.00	0.0	0.600	o	150	Pipe/Conduit
12.000	0.800	0.750	1.1	0.000	5.00	0.0	0.600	o	150	Pipe/Conduit
13.000	0.800	0.750	1.1	0.000	5.00	0.0	0.600	o	150	Pipe/Conduit
14.000	0.800	0.751	1.1	0.000	5.00	0.0	0.600	o	150	Pipe/Conduit
1.008	4.970	0.025	198.8	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit
1.009	17.500	-0.965	-18.1	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit

Network Results Table

PN	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Vel (m/s)	Cap (l/s)
9.000	11.900	0.000	0.0	10.16	179.6
10.000	11.850	0.000	0.0	9.84	173.9
11.000	11.850	0.000	0.0	9.84	173.9
12.000	11.850	0.000	0.0	9.84	173.9
13.000	11.850	0.000	0.0	9.84	173.9
14.000	11.851	0.000	0.0	9.85	174.0
1.008	10.100	1.993	0.0	0.92	36.7
1.009	10.075	1.993	0.0	0.00	0.0

Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
SP1	12.225	0.975	Open Manhole	1200	1.000	11.250	225				
MH S100	12.247	1.005	Open Manhole	1200	1.001	11.242	225	1.000	11.242	225	
SP3	12.225	0.975	Open Manhole	1200	2.000	11.250	375				
MH S101	12.245	1.480	Open Manhole	1500	1.002	10.765	375	1.001	10.915	225	
								2.000	10.765	375	
SP2	11.750	0.650	Open Manhole	1200	3.000	11.100	300				
MH S102	12.884	1.799	Open Manhole	1200	3.001	11.085	300	3.000	11.085	300	
SP4	12.353	1.038	Open Manhole	1200	4.000	11.315	150				
MH S103	12.363	1.683	Open Manhole	1500	1.003	10.680	375	1.002	10.680	375	
								3.001	10.755	300	
								4.000	10.905	150	
PI1	12.400	1.835	Open Manhole	1200	1.004	10.565	375	1.003	10.665	375	100
MH S104	12.798	2.315	Open Manhole	1500	1.005	10.483	375	1.004	10.483	375	
SP5	12.853	1.243	Open Manhole	1200	5.000	11.610	150				
MH S105	12.867	2.543	Open Manhole	1500	1.006	10.324	450	1.005	10.399	375	
								5.000	10.624	150	
MH S106	12.844	2.637	Open Manhole	1500	1.007	10.312	525	1.006	10.207	450	
MH S107	12.734	1.734	Open Manhole	1500	6.000	11.000	375				
SP6	12.900	0.900	Open Manhole	1200	7.000	12.000	150				
MH S108	12.392	0.605	Open Manhole	1500	7.001	11.787	300	7.000	11.937	150	
PPIC1	12.754	0.714	Open Manhole	1200	8.000	12.040	150				
PPIC2	12.650	0.750	Open Manhole	1200	9.000	11.900	150				
PPIC3	12.600	0.750	Open Manhole	1200	10.000	11.850	150				
PPIC4	12.600	0.750	Open Manhole	1200	11.000	11.850	150				
PPIC5	12.600	0.750	Open Manhole	1200	12.000	11.850	150				

Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
PPIC6	12.600	0.750	Open Manhole	1200	13.000	11.850	150				
PPIC7	12.600	0.749	Open Manhole	1200	14.000	11.851	150				
TANK	12.600	2.500	Open Manhole	1200	1.008	10.100	225	1.007	10.100	525	
								6.000	10.700	375	750
								7.001	10.700	300	675
								8.000	11.100	150	925
								9.000	11.100	150	925
								10.000	11.100	150	925
								11.000	11.100	150	925
								12.000	11.100	150	925
								13.000	11.100	150	925
								14.000	11.100	150	925
PS	12.840	2.765	Open Manhole	1200	1.009	10.075	150	1.008	10.075	225	
HW1	12.400	1.360	Open Manhole	0		OUTFALL		1.009	11.040	150	

No coordinates have been specified, layout information cannot be produced.

PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	o	225	SP1	12.225	11.250	0.750	Open Manhole	1200
1.001	o	225	MH S100	12.247	11.242	0.780	Open Manhole	1200
2.000	o	375	SP3	12.225	11.250	0.600	Open Manhole	1200
1.002	o	375	MH S101	12.245	10.765	1.105	Open Manhole	1500
3.000	o	300	SP2	11.750	11.100	0.350	Open Manhole	1200
3.001	o	300	MH S102	12.884	11.085	1.499	Open Manhole	1200
4.000	o	150	SP4	12.353	11.315	0.888	Open Manhole	1200
1.003	o	375	MH S103	12.363	10.680	1.308	Open Manhole	1500

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	1.600	200.0	MH S100	12.247	11.242	0.780	Open Manhole	1200
1.001	65.460	200.2	MH S101	12.245	10.915	1.105	Open Manhole	1500
2.000	1.200	2.5	MH S101	12.245	10.765	1.105	Open Manhole	1500
1.002	16.970	199.6	MH S103	12.363	10.680	1.308	Open Manhole	1500
3.000	2.950	196.7	MH S102	12.884	11.085	1.499	Open Manhole	1200
3.001	38.230	115.8	MH S103	12.363	10.755	1.308	Open Manhole	1500
4.000	1.840	4.5	MH S103	12.363	10.905	1.308	Open Manhole	1500
1.003	2.500	166.7	PI1	12.400	10.665	1.360	Open Manhole	1200

PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.004	o	375	PI1	12.400	10.565	1.460	Open Manhole	1200
1.005	o	375	MH S104	12.798	10.483	1.940	Open Manhole	1500
5.000	o	150	SP5	12.853	11.610	1.093	Open Manhole	1200
1.006	o	450	MH S105	12.867	10.324	2.093	Open Manhole	1500
1.007	o	525	MH S106	12.844	10.312	2.007	Open Manhole	1500
6.000	o	375	MH S107	12.734	11.000	1.359	Open Manhole	1500
7.000	o	150	SP6	12.900	12.000	0.750	Open Manhole	1200
7.001	o	300	MH S108	12.392	11.787	0.305	Open Manhole	1500

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.004	16.320	199.0	MH S104	12.798	10.483	1.940	Open Manhole	1500
1.005	16.790	199.9	MH S105	12.867	10.399	2.093	Open Manhole	1500
5.000	1.360	1.4	MH S105	12.867	10.624	2.093	Open Manhole	1500
1.006	23.430	200.3	MH S106	12.844	10.207	2.187	Open Manhole	1500
1.007	1.530	7.2	TANK	12.600	10.100	1.975	Open Manhole	1200
6.000	2.240	7.5	TANK	12.600	10.700	1.525	Open Manhole	1200
7.000	11.320	179.7	MH S108	12.392	11.937	0.305	Open Manhole	1500
7.001	23.830	21.9	TANK	12.600	10.700	1.600	Open Manhole	1200

PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
8.000	o	150	PPIC1	12.754	12.040	0.564	Open Manhole	1200
9.000	o	150	PPIC2	12.650	11.900	0.600	Open Manhole	1200
10.000	o	150	PPIC3	12.600	11.850	0.600	Open Manhole	1200
11.000	o	150	PPIC4	12.600	11.850	0.600	Open Manhole	1200
12.000	o	150	PPIC5	12.600	11.850	0.600	Open Manhole	1200
13.000	o	150	PPIC6	12.600	11.850	0.600	Open Manhole	1200
14.000	o	150	PPIC7	12.600	11.851	0.599	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
8.000	1.000	1.1	TANK	12.600	11.100	1.350	Open Manhole	1200
9.000	0.800	1.0	TANK	12.600	11.100	1.350	Open Manhole	1200
10.000	0.800	1.1	TANK	12.600	11.100	1.350	Open Manhole	1200
11.000	0.800	1.1	TANK	12.600	11.100	1.350	Open Manhole	1200
12.000	0.800	1.1	TANK	12.600	11.100	1.350	Open Manhole	1200
13.000	0.800	1.1	TANK	12.600	11.100	1.350	Open Manhole	1200
14.000	0.800	1.1	TANK	12.600	11.100	1.350	Open Manhole	1200

PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.008	o	225	TANK	12.600	10.100	2.275	Open Manhole	1200
1.009	o	150	PS	12.840	10.075	2.615	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.008	4.970	198.8	PS	12.840	10.075	2.540	Open Manhole	1200
1.009	17.500	-18.1	HW1	12.400	11.040	1.210	Open Manhole	0

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1.009	HW1	12.400	11.040	0.000	0	0

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Manhole Headloss Coeff (Global)	0.500	Inlet Coeffiecient	0.800
Areal Reduction Factor	1.000	Foul Sewage per hectare (l/s)	0.000	Flow per Person per Day (l/per/day)	0.000
Hot Start (mins)	0	Additional Flow - % of Total Flow	0.000	Run Time (mins)	60
Hot Start Level (mm)	0	MADD Factor * 10m³/ha Storage	2.000	Output Interval (mins)	1

Number of Input Hydrographs	0	Number of Offline Controls	0	Number of Time/Area Diagrams	7
Number of Online Controls	1	Number of Storage Structures	1	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FEH	Summer Storms	Yes
Return Period (years)	100	Winter Storms	Yes
FEH Rainfall Version	2013	Cv (Summer)	0.750
Site Location	GB 506317 164697 TQ 06317 64697	Cv (Winter)	0.840
Data Type	Point	Storm Duration (mins)	30

Online Controls for Storm

Pump Manhole: PS, DS/PN: 1.009, Volume (m³): 3.3

Invert Level (m) 10.075

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.200	7.5000	1.200	7.5000	2.200	7.5000	3.200	7.5000	4.200	7.5000	5.200	7.5000
0.400	7.5000	1.400	7.5000	2.400	7.5000	3.400	7.5000	4.400	7.5000	5.400	7.5000
0.600	7.5000	1.600	7.5000	2.600	7.5000	3.600	7.5000	4.600	7.5000	5.600	7.5000
0.800	7.5000	1.800	7.5000	2.800	7.5000	3.800	7.5000	4.800	7.5000	5.800	7.5000
1.000	7.5000	2.000	7.5000	3.000	7.5000	4.000	7.5000	5.000	7.5000	6.000	7.5000

Storage Structures for Storm

Complex Manhole: TANK, DS/PN: 1.008

Cellular Storage

Invert Level (m) 10.100 Infiltration Coefficient Side (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Base (m/hr) 0.00000 Safety Factor 2.0

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	1433.0	0.0	1.000	1433.0	0.0	1.001	0.0	0.0

Porous Car Park

Infiltration Coefficient Base (m/hr)	0.00000	Porosity	0.30	Slope (1:X)	65.0
Membrane Percolation (mm/hr)	1000	Invert Level (m)	12.100	Depression Storage (mm)	5
Max Percolation (l/s)	43.0	Width (m)	24.2	Evaporation (mm/day)	3
Safety Factor	2.0	Length (m)	6.4	Membrane Depth (mm)	0

Porous Car Park

Infiltration Coefficient Base (m/hr)	0.00000	Porosity	0.30	Slope (1:X)	63.0
Membrane Percolation (mm/hr)	1000	Invert Level (m)	12.100	Depression Storage (mm)	5
Max Percolation (l/s)	113.3	Width (m)	68.0	Evaporation (mm/day)	3
Safety Factor	2.0	Length (m)	6.0	Membrane Depth (mm)	0

Porous Car Park

Infiltration Coefficient Base (m/hr)	0.00000	Porosity	0.30	Slope (1:X)	0.0
Membrane Percolation (mm/hr)	1000	Invert Level (m)	12.100	Depression Storage (mm)	5
Max Percolation (l/s)	144.4	Width (m)	8.0	Evaporation (mm/day)	3
Safety Factor	2.0	Length (m)	65.0	Membrane Depth (mm)	0

Time Area Diagram at Pipe Number 8.000 for Storm

Total Area (ha) 0.038

Time From: (mins)	To:	Area (ha)	Time From: (mins)	To:	Area (ha)
0	4	0.019	4	8	0.019

Time Area Diagram at Pipe Number 9.000 for Storm

Total Area (ha) 0.038

Time From: (mins)	To:	Area (ha)	Time From: (mins)	To:	Area (ha)
0	4	0.019	4	8	0.019

Time Area Diagram at Pipe Number 10.000 for Storm

Total Area (ha) 0.038

Time From: (mins)	To:	Area (ha)	Time From: (mins)	To:	Area (ha)
0	4	0.019	4	8	0.019

Time Area Diagram at Pipe Number 11.000 for Storm

Total Area (ha) 0.038

Time From: (mins)	To:	Area (ha)	Time From: (mins)	To:	Area (ha)
0	4	0.019	4	8	0.019

Time Area Diagram at Pipe Number 12.000 for Storm

Total Area (ha) 0.038

Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)
0	4	0.019	4	8	0.019

Time Area Diagram at Pipe Number 13.000 for Storm

Total Area (ha) 0.038

Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)
0	4	0.019	4	8	0.019

Time Area Diagram at Pipe Number 14.000 for Storm

Total Area (ha) 0.038

Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)
0	4	0.019	4	8	0.019

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

Simulation Criteria

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

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 7
Number of Online Controls 1 Number of Storage Structures 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FEH Data Type Point
FEH Rainfall Version 2013 Cv (Summer) 0.750
Site Location GB 506317 164697 TQ 06317 64697 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep 2.5 Second Increment (Extended) Inertia Status OFF
DTS Status ON

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years) 100
Climate Change (%) 40

WARNING: Half Drain Time has not been calculated as the structure is too full.

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SP1	960 Winter	100	+40%	100/15 Summer	100/15 Summer			12.254	0.779	28.636	0.14			4.3	FLOOD
1.001	MH S100	960 Winter	100	+40%	100/15 Summer	100/600 Winter			12.254	0.787	6.882	0.12			4.3	FLOOD
2.000	SP3	960 Winter	100	+40%	100/15 Summer	100/480 Winter			12.264	0.639	38.760	0.04			9.8	FLOOD
1.002	MH S101	960 Winter	100	+40%	100/15 Summer	100/600 Winter			12.264	1.124	18.749	0.12			13.9	FLOOD
3.000	SP2	960 Winter	100	+40%	100/15 Summer	100/15 Summer			12.265	0.865	514.983	0.18			9.4	FLOOD

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

PN	US/MH Name	Level Exceeded
1.000	SP1	9
1.001	MH S100	3
2.000	SP3	5
1.002	MH S101	4
3.000	SP2	28

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
3.001	MH S102	960 Winter	100	+40%	100/15 Summer				12.265	0.880	0.000	0.10			9.4	SURCHARGED
4.000	SP4	960 Winter	100	+40%	100/15 Summer				12.267	0.802	0.000	0.05			1.9	FLOOD RISK
1.003	MH S103	960 Winter	100	+40%	100/15 Summer				12.267	1.212	0.000	0.29			24.6	FLOOD RISK
1.004	PI1	960 Winter	100	+40%	100/15 Summer				12.269	1.329	0.000	0.22			24.5	FLOOD RISK
1.005	MH S104	720 Winter	100	+40%	100/15 Summer				12.277	1.419	0.000	0.27			30.5	SURCHARGED
5.000	SP5	600 Winter	100	+40%	100/15 Winter				12.308	0.548	0.000	0.04			2.3	SURCHARGED
1.006	MH S105	600 Winter	100	+40%	100/15 Summer				12.307	1.533	0.000	0.29			54.1	SURCHARGED
1.007	MH S106	480 Winter	100	+40%	100/15 Summer				12.335	1.498	0.000	0.29			101.5	SURCHARGED
6.000	MH S107	480 Winter	100	+40%	100/15 Summer				12.343	0.968	0.000	0.18			38.3	SURCHARGED
7.000	SP6	15 Winter	100	+40%	100/15 Summer				12.567	0.417	0.000	2.77			33.0	SURCHARGED
7.001	MH S108	480 Winter	100	+40%	100/120 Winter				12.351	0.264	0.000	0.12			25.3	FLOOD RISK
8.000	PPIC1	480 Winter	100	+40%	100/180 Winter				12.342	0.152	0.000	0.05			3.2	SURCHARGED
9.000	PPIC2	480 Winter	100	+40%	100/120 Winter				12.342	0.292	0.000	0.06			3.2	SURCHARGED
10.000	PPIC3	480 Winter	100	+40%	100/120 Winter				12.342	0.342	0.000	0.06			3.2	FLOOD RISK
11.000	PPIC4	480 Winter	100	+40%	100/120 Winter				12.342	0.342	0.000	0.06			3.2	FLOOD RISK
12.000	PPIC5	480 Winter	100	+40%	100/120 Winter				12.342	0.342	0.000	0.06			3.2	FLOOD RISK
13.000	PPIC6	480 Winter	100	+40%	100/120 Winter				12.342	0.342	0.000	0.06			3.2	FLOOD RISK
14.000	PPIC7	480 Winter	100	+40%	100/120 Winter				12.342	0.341	0.000	0.06			3.2	FLOOD RISK
1.008	TANK	480 Winter	100	+40%	100/15 Summer				12.342	2.017	0.000	0.50			13.4	FLOOD RISK
1.009	PS	480 Winter	100	+40%	100/15 Summer				12.374	2.149	0.000	1.72			7.5	SURCHARGED

PN	US/MH Name	Level Exceeded
3.001	MH S102	
4.000	SP4	
1.003	MH S103	
1.004	PI1	
1.005	MH S104	
5.000	SP5	
1.006	MH S105	

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

PN	US/MH Name	Level Exceeded
1.007	MH S106	
6.000	MH S107	
7.000	SP6	
7.001	MH S108	
8.000	PPIC1	
9.000	PPIC2	
10.000	PPIC3	
11.000	PPIC4	
12.000	PPIC5	
13.000	PPIC6	
14.000	PPIC7	
1.008	TANK	
1.009	PS	

Time Area Diagram for Storm

Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.465	4-8	0.215

Total Area Contributing (ha) = 0.680

Total Pipe Volume (m^3) = 13.790

Existing Network Details for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type
1.000	2.570	0.017	151.2	0.014	5.00	0.0	0.600	o	150	Pipe/Conduit
1.001	31.800	0.159	200.0	0.077	5.00	0.0	0.600	o	225	Pipe/Conduit
2.000	4.280	0.076	56.3	0.007	5.00	0.0	0.600	o	150	Pipe/Conduit
1.002	9.270	0.046	201.5	0.077	5.00	0.0	0.600	o	300	Pipe/Conduit
1.003	10.230	0.228	44.9	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit
3.000	6.760	0.034	198.8	0.043	5.00	0.0	0.600	o	225	Pipe/Conduit
4.000	6.650	0.069	96.4	0.024	5.00	0.0	0.600	o	225	Pipe/Conduit
3.001	26.300	0.209	125.8	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit

Network Results Table

PN	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Vel (m/s)	Cap (l/s)
1.000	12.000	0.014	0.0	0.81	14.4
1.001	11.908	0.091	0.0	0.92	36.6
2.000	11.900	0.007	0.0	1.34	23.7
1.002	11.674	0.175	0.0	1.10	78.0
1.003	11.628	0.175	0.0	2.35	166.4
3.000	11.390	0.043	0.0	0.92	36.7
4.000	11.425	0.024	0.0	1.33	53.0
3.001	11.281	0.067	0.0	1.40	99.0

Existing Network Details for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type
5.000	1.110	0.228	4.9	0.097	5.00	0.0	0.600	o	300	Pipe/Conduit
6.000	14.980	0.075	199.7	0.107	5.00	0.0	0.600	o	225	Pipe/Conduit
6.001	39.450	0.197	200.3	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit
7.000	1.620	0.337	4.8	0.092	5.00	0.0	0.600	o	225	Pipe/Conduit
6.002	12.310	0.236	52.2	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit
3.002	1.490	0.007	212.9	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit
3.003	1.410	0.010	141.0	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit
8.000	3.940	0.026	151.5	0.010	5.00	0.0	0.600	o	150	Pipe/Conduit
8.001	27.970	0.147	190.3	0.066	5.00	0.0	0.600	o	225	Pipe/Conduit

Network Results Table

PN	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Vel (m/s)	Cap (l/s)
5.000	11.300	0.097	0.0	7.17	506.9
6.000	11.730	0.107	0.0	0.92	36.6
6.001	11.655	0.107	0.0	0.92	36.6
7.000	11.870	0.092	0.0	6.01	238.9
6.002	11.308	0.199	0.0	2.51	277.6
3.002	11.072	0.363	0.0	1.39	221.0
3.003	11.065	0.363	0.0	1.71	272.0
8.000	12.000	0.010	0.0	0.81	14.4
8.001	11.899	0.076	0.0	0.94	37.6

Existing Network Details for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type
8.002	34.160	0.167	204.6	0.066	5.00	0.0	0.600	o	300	Pipe/Conduit
8.003	2.240	0.185	12.1	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit
1.004	1.780	0.008	222.5	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit
1.005	17.120	0.077	222.3	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit

Network Results Table

PN	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Vel (m/s)	Cap (l/s)
8.002	11.752	0.142	0.0	1.10	77.4
8.003	11.585	0.142	0.0	4.54	321.1
1.004	11.055	0.680	0.0	0.87	34.7
1.005	11.047	0.680	0.0	0.87	34.7

Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
SP1	12.900	0.900	Open Manhole	1200	1.000	12.000	150				
MH S200	12.923	1.015	Open Manhole	1200	1.001	11.908	225	1.000	11.983	150	
SP2	12.802	0.902	Open Manhole	1200	2.000	11.900	150				
MH S201	12.903	1.229	Open Manhole	1500	1.002	11.674	300	1.001	11.749	225	
								2.000	11.824	150	
MH S202	12.687	1.059	Open Manhole	1500	1.003	11.628	300	1.002	11.628	300	
SP3	12.304	0.914	Open Manhole	1200	3.000	11.390	225				
SP4	12.299	0.874	Open Manhole	1200	4.000	11.425	225				
MH S203	12.328	1.047	Open Manhole	1200	3.001	11.281	300	3.000	11.356	225	
								4.000	11.356	225	
SP5	12.400	1.100	Open Manhole	1200	5.000	11.300	300				
SP7	12.705	0.975	Open Manhole	1200	6.000	11.730	225				
MH S206	12.795	1.140	Open Manhole	1200	6.001	11.655	225	6.000	11.655	225	
SP6	12.497	0.627	Open Manhole	1200	7.000	11.870	225				
MH S205	12.494	1.186	Open Manhole	1500	6.002	11.308	375	6.001	11.458	225	
								7.000	11.533	225	75
MH S204	12.422	1.350	Open Manhole	1500	3.002	11.072	450	3.001	11.072	300	
								5.000	11.072	300	
								6.002	11.072	375	
PI2	12.450	1.385	Open Manhole	1200	3.003	11.065	450	3.002	11.065	450	
SP8	12.905	0.905	Open Manhole	1200	8.000	12.000	150				
MH S207	12.918	1.019	Open Manhole	1200	8.001	11.899	225	8.000	11.974	150	
MH S208	12.791	1.039	Open Manhole	1500	8.002	11.752	300	8.001	11.752	225	
MH S209	12.696	1.111	Open Manhole	1500	8.003	11.585	300	8.002	11.585	300	
TANK	12.600	1.545	Open Manhole	1200	1.004	11.055	225	1.003	11.400	300	420

Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
								3.003	11.055	450	
								8.003	11.400	300	420
MH S210 (FC)	12.531	1.484	Open Manhole	1200	1.005	11.047	225	1.004	11.047	225	
HW2	11.250	0.280	Open Manhole	0		OUTFALL		1.005	10.970	225	

No coordinates have been specified, layout information cannot be produced.

PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	o	150	SP1	12.900	12.000	0.750	Open Manhole	1200
1.001	o	225	MH S200	12.923	11.908	0.790	Open Manhole	1200
2.000	o	150	SP2	12.802	11.900	0.752	Open Manhole	1200
1.002	o	300	MH S201	12.903	11.674	0.929	Open Manhole	1500
1.003	o	300	MH S202	12.687	11.628	0.759	Open Manhole	1500
3.000	o	225	SP3	12.304	11.390	0.689	Open Manhole	1200
4.000	o	225	SP4	12.299	11.425	0.649	Open Manhole	1200
3.001	o	300	MH S203	12.328	11.281	0.747	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	2.570	151.2	MH S200	12.923	11.983	0.790	Open Manhole	1200
1.001	31.800	200.0	MH S201	12.903	11.749	0.929	Open Manhole	1500
2.000	4.280	56.3	MH S201	12.903	11.824	0.929	Open Manhole	1500
1.002	9.270	201.5	MH S202	12.687	11.628	0.759	Open Manhole	1500
1.003	10.230	44.9	TANK	12.600	11.400	0.900	Open Manhole	1200
3.000	6.760	198.8	MH S203	12.328	11.356	0.747	Open Manhole	1200
4.000	6.650	96.4	MH S203	12.328	11.356	0.747	Open Manhole	1200
3.001	26.300	125.8	MH S204	12.422	11.072	1.050	Open Manhole	1500

PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
5.000	o	300	SP5	12.400	11.300	0.800	Open Manhole	1200
6.000	o	225	SP7	12.705	11.730	0.750	Open Manhole	1200
6.001	o	225	MH S206	12.795	11.655	0.915	Open Manhole	1200
7.000	o	225	SP6	12.497	11.870	0.402	Open Manhole	1200
6.002	o	375	MH S205	12.494	11.308	0.811	Open Manhole	1500
3.002	o	450	MH S204	12.422	11.072	0.900	Open Manhole	1500
3.003	o	450	PI2	12.450	11.065	0.935	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
5.000	1.110	4.9	MH S204	12.422	11.072	1.050	Open Manhole	1500
6.000	14.980	199.7	MH S206	12.795	11.655	0.915	Open Manhole	1200
6.001	39.450	200.3	MH S205	12.494	11.458	0.811	Open Manhole	1500
7.000	1.620	4.8	MH S205	12.494	11.533	0.736	Open Manhole	1500
6.002	12.310	52.2	MH S204	12.422	11.072	0.975	Open Manhole	1500
3.002	1.490	212.9	PI2	12.450	11.065	0.935	Open Manhole	1200
3.003	1.410	141.0	TANK	12.600	11.055	1.095	Open Manhole	1200

PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
8.000	o	150	SP8	12.905	12.000	0.755	Open Manhole	1200
8.001	o	225	MH S207	12.918	11.899	0.794	Open Manhole	1200
8.002	o	300	MH S208	12.791	11.752	0.739	Open Manhole	1500
8.003	o	300	MH S209	12.696	11.585	0.811	Open Manhole	1500
1.004	o	225	TANK	12.600	11.055	1.320	Open Manhole	1200
1.005	o	225	MH S210 (FC)	12.531	11.047	1.259	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
8.000	3.940	151.5	MH S207	12.918	11.974	0.794	Open Manhole	1200
8.001	27.970	190.3	MH S208	12.791	11.752	0.814	Open Manhole	1500
8.002	34.160	204.6	MH S209	12.696	11.585	0.811	Open Manhole	1500
8.003	2.240	12.1	TANK	12.600	11.400	0.900	Open Manhole	1200
1.004	1.780	222.5	MH S210 (FC)	12.531	11.047	1.259	Open Manhole	1200
1.005	17.120	222.3	HW2	11.250	10.970	0.055	Open Manhole	0

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1.005	HW2	11.250	10.970	0.000	0	0

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Manhole Headloss Coeff (Global)	0.500	Inlet Coeffiecient	0.800
Areal Reduction Factor	1.000	Foul Sewage per hectare (l/s)	0.000	Flow per Person per Day (l/per/day)	0.000
Hot Start (mins)	0	Additional Flow - % of Total Flow	0.000	Run Time (mins)	60
Hot Start Level (mm)	0	MADD Factor * 10m³/ha Storage	2.000	Output Interval (mins)	1

Number of Input Hydrographs	0	Number of Offline Controls	0	Number of Time/Area Diagrams	0
Number of Online Controls	1	Number of Storage Structures	1	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FEH	Summer Storms	Yes
Return Period (years)	100	Winter Storms	Yes
FEH Rainfall Version	2013	Cv (Summer)	0.750
Site Location	GB 506317 164697 TQ 06317 64697	Cv (Winter)	0.840
Data Type	Point	Storm Duration (mins)	30

Online Controls for Storm

Hydro-Brake® Optimum Manhole: MH S210 (FC), DS/PN: 1.005, Volume (m³): 1.7

Unit Reference	MD-SHE-0075-2300-0808-2300	Sump Available	Yes
Design Head (m)	0.808	Diameter (mm)	75
Design Flow (l/s)	2.3	Invert Level (m)	11.047
Flush-Flo™	Calculated	Minimum Outlet Pipe Diameter (mm)	100
Objective	Minimise upstream storage	Suggested Manhole Diameter (mm)	1200
Application	Surface		

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.808	2.3	Kick-Flo®	0.512	1.9
Flush-Flo™	0.241	2.3	Mean Flow over Head Range	-	2.0

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

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.0	0.600	2.0	1.600	3.1	2.600	3.9	5.000	5.3	7.500	6.5
0.200	2.3	0.800	2.3	1.800	3.3	3.000	4.2	5.500	5.6	8.000	6.7
0.300	2.3	1.000	2.5	2.000	3.5	3.500	4.5	6.000	5.8	8.500	6.9
0.400	2.2	1.200	2.8	2.200	3.6	4.000	4.8	6.500	6.1	9.000	7.1
0.500	1.9	1.400	3.0	2.400	3.8	4.500	5.1	7.000	6.3	9.500	7.3

Storage Structures for Storm

Cellular Storage Manhole: TANK, DS/PN: 1.004

Invert Level (m) 11.055 Infiltration Coefficient Side (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Base (m/hr) 0.00000 Safety Factor 2.0

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	625.0	0.0	0.800	625.0	0.0	0.801	0.0	0.0

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

Simulation Criteria

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

Number of Input Hydrographs	0	Number of Offline Controls	0	Number of Time/Area Diagrams	0
Number of Online Controls	1	Number of Storage Structures	1	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FEH	Data Type	Point
FEH Rainfall Version	2013	Cv (Summer)	0.750
Site Location	GB 506317 164697 TQ 06317 64697	Cv (Winter)	0.840

Margin for Flood Risk Warning (mm)	300.0	DVD Status	OFF
Analysis Timestep	2.5 Second Increment (Extended)	Inertia Status	OFF
DTS Status	ON		

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years)	2, 30, 100
Climate Change (%)	0, 0, 20

WARNING: Half Drain Time has not been calculated as the structure is too full.

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SP1	15 Winter	2	+0%	100/15 Summer				12.046	-0.104	0.000	0.20			2.2	OK
1.001	MH S200	15 Winter	2	+0%	30/15 Winter				12.011	-0.122	0.000	0.42			14.3	OK
2.000	SP2	15 Winter	2	+0%	100/15 Summer				11.925	-0.125	0.000	0.06			1.1	OK
1.002	MH S201	15 Winter	2	+0%	30/15 Winter				11.817	-0.157	0.000	0.46			27.5	OK
1.003	MH S202	15 Winter	2	+0%	100/480 Winter				11.725	-0.203	0.000	0.23			27.5	OK

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

PN	US/MH Name	Level Exceeded
1.000	SP1	
1.001	MH S200	
2.000	SP2	
1.002	MH S201	
1.003	MH S202	

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
3.000	SP3	15 Winter	2	+0%	100/15 Summer	100/960 Winter			11.465	-0.150	0.000	0.24			6.8
4.000	SP4	15 Winter	2	+0%	100/15 Summer	100/720 Winter			11.474	-0.176	0.000	0.10			3.8
3.001	MH S203	15 Winter	2	+0%	100/15 Summer				11.350	-0.231	0.000	0.12			10.7
5.000	SP5	15 Winter	2	+0%	100/15 Summer				11.372	-0.228	0.000	0.13			15.5
6.000	SP7	15 Winter	2	+0%	30/15 Summer				11.848	-0.107	0.000	0.52			16.9
6.001	MH S206	15 Winter	2	+0%	30/15 Summer				11.766	-0.114	0.000	0.48			16.8
7.000	SP6	15 Winter	2	+0%	100/480 Winter				11.935	-0.160	0.000	0.18			14.7
6.002	MH S205	15 Winter	2	+0%	100/15 Summer				11.409	-0.274	0.000	0.16			31.1
3.002	MH S204	480 Winter	2	+0%	30/360 Winter				11.285	-0.237	0.000	0.06			8.3
3.003	PI2	480 Winter	2	+0%	30/240 Winter				11.284	-0.231	0.000	0.06			8.3
8.000	SP8	15 Winter	2	+0%	100/15 Summer				12.039	-0.111	0.000	0.15			1.6
8.001	MH S207	15 Winter	2	+0%	100/15 Summer				11.991	-0.133	0.000	0.34			12.0
8.002	MH S208	15 Winter	2	+0%	100/15 Summer				11.867	-0.185	0.000	0.31			21.9
8.003	MH S209	15 Winter	2	+0%	100/480 Winter				11.677	-0.208	0.000	0.20			21.8
1.004	TANK	480 Winter	2	+0%	2/360 Winter				11.284	0.004	0.000	0.18			5.3
1.005	MH S210 (FC)	360 Winter	2	+0%	2/240 Winter				11.325	0.053	0.000	0.07			2.3

PN	US/MH Name	Status	Level Exceeded
3.000	SP3	OK	1
4.000	SP4	OK	2
3.001	MH S203	OK	
5.000	SP5	OK	
6.000	SP7	OK	
6.001	MH S206	OK	
7.000	SP6	OK	
6.002	MH S205	OK	
3.002	MH S204	OK	
3.003	PI2	OK	
8.000	SP8	OK	

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

PN	US/MH Name	Status	Level Exceeded
8.001	MH S207	OK	
8.002	MH S208	OK	
8.003	MH S209	OK	
1.004	TANK	SURCHARGED	
1.005	MH S210 (FC)	SURCHARGED	

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

Simulation Criteria

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

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 1 Number of Storage Structures 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FEH Data Type Point
FEH Rainfall Version 2013 Cv (Summer) 0.750
Site Location GB 506317 164697 TQ 06317 64697 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep 2.5 Second Increment (Extended) Inertia Status OFF
DTS Status ON

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years) 2, 30, 100
Climate Change (%) 0, 0, 20

WARNING: Half Drain Time has not been calculated as the structure is too full.

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SP1	15 Winter	30	+0%	100/15 Summer				12.144	-0.006	0.000	0.51			5.5	OK
1.001	MH S200	15 Winter	30	+0%	30/15 Winter				12.138	0.005	0.000	0.99			33.9	SURCHARGED
2.000	SP2	15 Winter	30	+0%	100/15 Summer				11.987	-0.063	0.000	0.15			2.6	OK
1.002	MH S201	15 Winter	30	+0%	30/15 Winter				11.982	0.008	0.000	1.04			62.7	SURCHARGED
1.003	MH S202	15 Winter	30	+0%	100/480 Winter				11.786	-0.142	0.000	0.53			63.7	OK

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

PN	US/MH Name	Level Exceeded
1.000	SP1	
1.001	MH S200	
2.000	SP2	
1.002	MH S201	
1.003	MH S202	

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
3.000	SP3	720 Winter	30	+0%	100/15 Summer	100/960 Winter			11.569	-0.046	0.000	0.05			1.4
4.000	SP4	720 Winter	30	+0%	100/15 Summer	100/720 Winter			11.569	-0.081	0.000	0.02			0.8
3.001	MH S203	720 Winter	30	+0%	100/15 Summer				11.569	-0.012	0.000	0.02			2.2
5.000	SP5	720 Winter	30	+0%	100/15 Summer				11.570	-0.030	0.000	0.03			3.2
6.000	SP7	15 Winter	30	+0%	30/15 Summer				12.051	0.096	0.000	1.25			40.2
6.001	MH S206	15 Winter	30	+0%	30/15 Summer				11.933	0.053	0.000	1.14			39.4
7.000	SP6	15 Winter	30	+0%	100/480 Winter				11.977	-0.118	0.000	0.45			36.8
6.002	MH S205	720 Winter	30	+0%	100/15 Summer				11.570	-0.113	0.000	0.03			6.6
3.002	MH S204	720 Winter	30	+0%	30/360 Winter				11.570	0.048	0.000	0.09			11.6
3.003	PI2	720 Winter	30	+0%	30/240 Winter				11.569	0.054	0.000	0.09			11.5
8.000	SP8	15 Winter	30	+0%	100/15 Summer				12.073	-0.077	0.000	0.37			4.0
8.001	MH S207	15 Winter	30	+0%	100/15 Summer				12.065	-0.059	0.000	0.86			30.0
8.002	MH S208	15 Winter	30	+0%	100/15 Summer				11.954	-0.098	0.000	0.77			54.8
8.003	MH S209	15 Winter	30	+0%	100/480 Winter				11.737	-0.148	0.000	0.51			54.7
1.004	TANK	720 Winter	30	+0%	2/360 Winter				11.569	0.289	0.000	0.18			5.3
1.005	MH S210 (FC)	720 Winter	30	+0%	2/240 Winter				11.608	0.336	0.000	0.07			2.3

PN	US/MH Name	Status	Level Exceeded
3.000	SP3	OK	1
4.000	SP4	OK	2
3.001	MH S203	OK	
5.000	SP5	OK	
6.000	SP7	SURCHARGED	
6.001	MH S206	SURCHARGED	
7.000	SP6	OK	
6.002	MH S205	OK	
3.002	MH S204	SURCHARGED	
3.003	PI2	SURCHARGED	
8.000	SP8	OK	

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

PN	US/MH Name	Status	Level Exceeded
8.001	MH S207	OK	
8.002	MH S208	OK	
8.003	MH S209	OK	
1.004	TANK	SURCHARGED	
1.005	MH S210 (FC)	SURCHARGED	

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

Simulation Criteria

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

Number of Input Hydrographs	0	Number of Offline Controls	0	Number of Time/Area Diagrams	0
Number of Online Controls	1	Number of Storage Structures	1	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FEH	Data Type	Point
FEH Rainfall Version	2013	Cv (Summer)	0.750
Site Location	GB 506317 164697 TQ 06317 64697	Cv (Winter)	0.840

Margin for Flood Risk Warning (mm)	300.0	DVD Status	OFF
Analysis Timestep	2.5 Second Increment (Extended)	Inertia Status	OFF
DTS Status	ON		

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years)	2, 30, 100
Climate Change (%)	0, 0, 20

WARNING: Half Drain Time has not been calculated as the structure is too full.

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SP1	15 Winter	100	+20%	100/15 Summer				12.473	0.323	0.000	0.84			9.1	SURCHARGED
1.001	MH S200	15 Winter	100	+20%	30/15 Winter				12.463	0.330	0.000	1.52			52.1	SURCHARGED
2.000	SP2	720 Winter	100	+20%	100/15 Summer				12.311	0.261	0.000	0.02			0.4	SURCHARGED
1.002	MH S201	720 Winter	100	+20%	30/15 Winter				12.311	0.337	0.000	0.15			9.2	SURCHARGED
1.003	MH S202	720 Winter	100	+20%	100/480 Winter				12.311	0.383	0.000	0.08			9.2	SURCHARGED

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

PN	US/MH Name	Level Exceeded
1.000	SP1	
1.001	MH S200	
2.000	SP2	
1.002	MH S201	
1.003	MH S202	

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
3.000	SP3	960 Winter	100	+20%	100/15 Summer	100/960 Winter			12.304	0.689	0.064	0.06			1.7
4.000	SP4	960 Winter	100	+20%	100/15 Summer	100/720 Winter			12.304	0.654	4.799	0.08			2.8
3.001	MH S203	720 Winter	100	+20%	100/15 Summer				12.311	0.730	0.000	0.06			5.0
5.000	SP5	720 Winter	100	+20%	100/15 Summer				12.310	0.710	0.000	0.04			5.0
6.000	SP7	15 Winter	100	+20%	30/15 Summer				12.568	0.613	0.000	1.79			57.6
6.001	MH S206	15 Winter	100	+20%	30/15 Summer				12.319	0.439	0.000	1.63			56.4
7.000	SP6	720 Winter	100	+20%	100/480 Winter				12.310	0.215	0.000	0.06			4.8
6.002	MH S205	720 Winter	100	+20%	100/15 Summer				12.310	0.627	0.000	0.05			10.3
3.002	MH S204	720 Winter	100	+20%	30/360 Winter				12.311	0.789	0.000	0.14			18.3
3.003	PI2	720 Winter	100	+20%	30/240 Winter				12.312	0.797	0.000	0.14			18.1
8.000	SP8	15 Winter	100	+20%	100/15 Summer				12.343	0.193	0.000	0.61			6.6
8.001	MH S207	15 Winter	100	+20%	100/15 Summer				12.333	0.209	0.000	1.24			43.4
8.002	MH S208	720 Winter	100	+20%	100/15 Summer				12.311	0.259	0.000	0.10			7.4
8.003	MH S209	720 Winter	100	+20%	100/480 Winter				12.311	0.426	0.000	0.07			7.4
1.004	TANK	720 Winter	100	+20%	2/360 Winter				12.312	1.032	0.000	0.16			4.8
1.005	MH S210 (FC)	720 Winter	100	+20%	2/240 Winter				12.317	1.045	0.000	0.09			2.8

PN	US/MH Name	Status	Level Exceeded
3.000	SP3	FLOOD	1
4.000	SP4	FLOOD	2
3.001	MH S203	FLOOD RISK	
5.000	SP5	FLOOD RISK	
6.000	SP7	FLOOD RISK	
6.001	MH S206	SURCHARGED	
7.000	SP6	FLOOD RISK	
6.002	MH S205	FLOOD RISK	
3.002	MH S204	FLOOD RISK	
3.003	PI2	FLOOD RISK	
8.000	SP8	SURCHARGED	

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

PN	US/MH Name	Status	Level Exceeded
8.001	MH S207	SURCHARGED	
8.002	MH S208	SURCHARGED	
8.003	MH S209	SURCHARGED	
1.004	TANK	FLOOD RISK	
1.005	MH S210 (FC)	FLOOD RISK	

Time Area Diagram for Storm

Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.465	4-8	0.215

Total Area Contributing (ha) = 0.680

Total Pipe Volume (m^3) = 13.790

Existing Network Details for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type
1.000	2.570	0.017	151.2	0.014	5.00	0.0	0.600	o	150	Pipe/Conduit
1.001	31.800	0.159	200.0	0.077	5.00	0.0	0.600	o	225	Pipe/Conduit
2.000	4.280	0.076	56.3	0.007	5.00	0.0	0.600	o	150	Pipe/Conduit
1.002	9.270	0.046	201.5	0.077	5.00	0.0	0.600	o	300	Pipe/Conduit
1.003	10.230	0.228	44.9	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit
3.000	6.760	0.034	198.8	0.043	5.00	0.0	0.600	o	225	Pipe/Conduit
4.000	6.650	0.069	96.4	0.024	5.00	0.0	0.600	o	225	Pipe/Conduit
3.001	26.300	0.209	125.8	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit

Network Results Table

PN	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Vel (m/s)	Cap (l/s)
1.000	12.000	0.014	0.0	0.81	14.4
1.001	11.908	0.091	0.0	0.92	36.6
2.000	11.900	0.007	0.0	1.34	23.7
1.002	11.674	0.175	0.0	1.10	78.0
1.003	11.628	0.175	0.0	2.35	166.4
3.000	11.390	0.043	0.0	0.92	36.7
4.000	11.425	0.024	0.0	1.33	53.0
3.001	11.281	0.067	0.0	1.40	99.0

Existing Network Details for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type
5.000	1.110	0.228	4.9	0.097	5.00	0.0	0.600	o	300	Pipe/Conduit
6.000	14.980	0.075	199.7	0.107	5.00	0.0	0.600	o	225	Pipe/Conduit
6.001	39.450	0.197	200.3	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit
7.000	1.620	0.337	4.8	0.092	5.00	0.0	0.600	o	225	Pipe/Conduit
6.002	12.310	0.236	52.2	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit
3.002	1.490	0.007	212.9	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit
3.003	1.410	0.010	141.0	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit
8.000	3.940	0.026	151.5	0.010	5.00	0.0	0.600	o	150	Pipe/Conduit
8.001	27.970	0.147	190.3	0.066	5.00	0.0	0.600	o	225	Pipe/Conduit

Network Results Table

PN	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Vel (m/s)	Cap (l/s)
5.000	11.300	0.097	0.0	7.17	506.9
6.000	11.730	0.107	0.0	0.92	36.6
6.001	11.655	0.107	0.0	0.92	36.6
7.000	11.870	0.092	0.0	6.01	238.9
6.002	11.308	0.199	0.0	2.51	277.6
3.002	11.072	0.363	0.0	1.39	221.0
3.003	11.065	0.363	0.0	1.71	272.0
8.000	12.000	0.010	0.0	0.81	14.4
8.001	11.899	0.076	0.0	0.94	37.6

Existing Network Details for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type
8.002	34.160	0.167	204.6	0.066	5.00	0.0	0.600	o	300	Pipe/Conduit
8.003	2.240	0.185	12.1	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit
1.004	1.780	0.008	222.5	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit
1.005	17.120	0.077	222.3	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit

Network Results Table

PN	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Vel (m/s)	Cap (l/s)
8.002	11.752	0.142	0.0	1.10	77.4
8.003	11.585	0.142	0.0	4.54	321.1
1.004	11.055	0.680	0.0	0.87	34.7
1.005	11.047	0.680	0.0	0.87	34.7

Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
SP1	12.900	0.900	Open Manhole	1200	1.000	12.000	150				
MH S200	12.923	1.015	Open Manhole	1200	1.001	11.908	225	1.000	11.983	150	
SP2	12.802	0.902	Open Manhole	1200	2.000	11.900	150				
MH S201	12.903	1.229	Open Manhole	1500	1.002	11.674	300	1.001	11.749	225	
								2.000	11.824	150	
MH S202	12.687	1.059	Open Manhole	1500	1.003	11.628	300	1.002	11.628	300	
SP3	12.304	0.914	Open Manhole	1200	3.000	11.390	225				
SP4	12.299	0.874	Open Manhole	1200	4.000	11.425	225				
MH S203	12.328	1.047	Open Manhole	1200	3.001	11.281	300	3.000	11.356	225	
								4.000	11.356	225	
SP5	12.400	1.100	Open Manhole	1200	5.000	11.300	300				
SP7	12.705	0.975	Open Manhole	1200	6.000	11.730	225				
MH S206	12.795	1.140	Open Manhole	1200	6.001	11.655	225	6.000	11.655	225	
SP6	12.497	0.627	Open Manhole	1200	7.000	11.870	225				
MH S205	12.494	1.186	Open Manhole	1500	6.002	11.308	375	6.001	11.458	225	
								7.000	11.533	225	75
MH S204	12.422	1.350	Open Manhole	1500	3.002	11.072	450	3.001	11.072	300	
								5.000	11.072	300	
								6.002	11.072	375	
PI2	12.450	1.385	Open Manhole	1200	3.003	11.065	450	3.002	11.065	450	
SP8	12.905	0.905	Open Manhole	1200	8.000	12.000	150				
MH S207	12.918	1.019	Open Manhole	1200	8.001	11.899	225	8.000	11.974	150	
MH S208	12.791	1.039	Open Manhole	1500	8.002	11.752	300	8.001	11.752	225	
MH S209	12.696	1.111	Open Manhole	1500	8.003	11.585	300	8.002	11.585	300	
TANK	12.600	1.545	Open Manhole	1200	1.004	11.055	225	1.003	11.400	300	420

Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
								3.003	11.055	450	
								8.003	11.400	300	420
MH S210 (FC)	12.531	1.484	Open Manhole	1200	1.005	11.047	225	1.004	11.047	225	
HW2	11.250	0.280	Open Manhole	0		OUTFALL		1.005	10.970	225	

No coordinates have been specified, layout information cannot be produced.

PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	o	150	SP1	12.900	12.000	0.750	Open Manhole	1200
1.001	o	225	MH S200	12.923	11.908	0.790	Open Manhole	1200
2.000	o	150	SP2	12.802	11.900	0.752	Open Manhole	1200
1.002	o	300	MH S201	12.903	11.674	0.929	Open Manhole	1500
1.003	o	300	MH S202	12.687	11.628	0.759	Open Manhole	1500
3.000	o	225	SP3	12.304	11.390	0.689	Open Manhole	1200
4.000	o	225	SP4	12.299	11.425	0.649	Open Manhole	1200
3.001	o	300	MH S203	12.328	11.281	0.747	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	2.570	151.2	MH S200	12.923	11.983	0.790	Open Manhole	1200
1.001	31.800	200.0	MH S201	12.903	11.749	0.929	Open Manhole	1500
2.000	4.280	56.3	MH S201	12.903	11.824	0.929	Open Manhole	1500
1.002	9.270	201.5	MH S202	12.687	11.628	0.759	Open Manhole	1500
1.003	10.230	44.9	TANK	12.600	11.400	0.900	Open Manhole	1200
3.000	6.760	198.8	MH S203	12.328	11.356	0.747	Open Manhole	1200
4.000	6.650	96.4	MH S203	12.328	11.356	0.747	Open Manhole	1200
3.001	26.300	125.8	MH S204	12.422	11.072	1.050	Open Manhole	1500

PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
5.000	o	300	SP5	12.400	11.300	0.800	Open Manhole	1200
6.000	o	225	SP7	12.705	11.730	0.750	Open Manhole	1200
6.001	o	225	MH S206	12.795	11.655	0.915	Open Manhole	1200
7.000	o	225	SP6	12.497	11.870	0.402	Open Manhole	1200
6.002	o	375	MH S205	12.494	11.308	0.811	Open Manhole	1500
3.002	o	450	MH S204	12.422	11.072	0.900	Open Manhole	1500
3.003	o	450	PI2	12.450	11.065	0.935	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
5.000	1.110	4.9	MH S204	12.422	11.072	1.050	Open Manhole	1500
6.000	14.980	199.7	MH S206	12.795	11.655	0.915	Open Manhole	1200
6.001	39.450	200.3	MH S205	12.494	11.458	0.811	Open Manhole	1500
7.000	1.620	4.8	MH S205	12.494	11.533	0.736	Open Manhole	1500
6.002	12.310	52.2	MH S204	12.422	11.072	0.975	Open Manhole	1500
3.002	1.490	212.9	PI2	12.450	11.065	0.935	Open Manhole	1200
3.003	1.410	141.0	TANK	12.600	11.055	1.095	Open Manhole	1200

PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
8.000	o	150	SP8	12.905	12.000	0.755	Open Manhole	1200
8.001	o	225	MH S207	12.918	11.899	0.794	Open Manhole	1200
8.002	o	300	MH S208	12.791	11.752	0.739	Open Manhole	1500
8.003	o	300	MH S209	12.696	11.585	0.811	Open Manhole	1500
1.004	o	225	TANK	12.600	11.055	1.320	Open Manhole	1200
1.005	o	225	MH S210 (FC)	12.531	11.047	1.259	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
8.000	3.940	151.5	MH S207	12.918	11.974	0.794	Open Manhole	1200
8.001	27.970	190.3	MH S208	12.791	11.752	0.814	Open Manhole	1500
8.002	34.160	204.6	MH S209	12.696	11.585	0.811	Open Manhole	1500
8.003	2.240	12.1	TANK	12.600	11.400	0.900	Open Manhole	1200
1.004	1.780	222.5	MH S210 (FC)	12.531	11.047	1.259	Open Manhole	1200
1.005	17.120	222.3	HW2	11.250	10.970	0.055	Open Manhole	0

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1.005	HW2	11.250	10.970	0.000	0	0

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Manhole Headloss Coeff (Global)	0.500	Inlet Coeffiecient	0.800
Areal Reduction Factor	1.000	Foul Sewage per hectare (l/s)	0.000	Flow per Person per Day (l/per/day)	0.000
Hot Start (mins)	0	Additional Flow - % of Total Flow	0.000	Run Time (mins)	60
Hot Start Level (mm)	0	MADD Factor * 10m³/ha Storage	2.000	Output Interval (mins)	1

Number of Input Hydrographs	0	Number of Offline Controls	0	Number of Time/Area Diagrams	0
Number of Online Controls	1	Number of Storage Structures	1	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FEH	Summer Storms	Yes
Return Period (years)	100	Winter Storms	Yes
FEH Rainfall Version	2013	Cv (Summer)	0.750
Site Location	GB 506317 164697 TQ 06317 64697	Cv (Winter)	0.840
Data Type	Point	Storm Duration (mins)	30

Online Controls for Storm

Hydro-Brake® Optimum Manhole: MH S210 (FC), DS/PN: 1.005, Volume (m³): 1.7

Unit Reference	MD-SHE-0075-2300-0808-2300	Sump Available	Yes
Design Head (m)	0.808	Diameter (mm)	75
Design Flow (l/s)	2.3	Invert Level (m)	11.047
Flush-Flo™	Calculated	Minimum Outlet Pipe Diameter (mm)	100
Objective	Minimise upstream storage	Suggested Manhole Diameter (mm)	1200
Application	Surface		

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.808	2.3	Kick-Flo®	0.512	1.9
Flush-Flo™	0.241	2.3	Mean Flow over Head Range	-	2.0

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

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.0	0.600	2.0	1.600	3.1	2.600	3.9	5.000	5.3	7.500	6.5
0.200	2.3	0.800	2.3	1.800	3.3	3.000	4.2	5.500	5.6	8.000	6.7
0.300	2.3	1.000	2.5	2.000	3.5	3.500	4.5	6.000	5.8	8.500	6.9
0.400	2.2	1.200	2.8	2.200	3.6	4.000	4.8	6.500	6.1	9.000	7.1
0.500	1.9	1.400	3.0	2.400	3.8	4.500	5.1	7.000	6.3	9.500	7.3

Storage Structures for Storm

Cellular Storage Manhole: TANK, DS/PN: 1.004

Invert Level (m) 11.055 Infiltration Coefficient Side (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Base (m/hr) 0.00000 Safety Factor 2.0

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	625.0	0.0	0.800	625.0	0.0	0.801	0.0	0.0

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

Simulation Criteria

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

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 1 Number of Storage Structures 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FEH Data Type Point
FEH Rainfall Version 2013 Cv (Summer) 0.750
Site Location GB 506317 164697 TQ 06317 64697 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep 2.5 Second Increment (Extended) Inertia Status OFF
DTS Status ON

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years) 100
Climate Change (%) 40

WARNING: Half Drain Time has not been calculated as the structure is too full.

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SP1	15 Winter	100	+40%	100/15 Summer				12.660	0.510	0.000	1.00			10.8	FLOOD RISK
1.001	MH S200	15 Winter	100	+40%	100/15 Summer				12.646	0.513	0.000	1.76			60.3	FLOOD RISK
2.000	SP2	960 Winter	100	+40%	100/15 Summer				12.382	0.332	0.000	0.03			0.5	SURCHARGED
1.002	MH S201	960 Winter	100	+40%	100/15 Summer				12.404	0.430	0.000	0.14			8.4	SURCHARGED
1.003	MH S202	960 Winter	100	+40%	100/240 Winter				12.406	0.478	0.000	0.07			8.4	FLOOD RISK

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

PN	US/MH Name	Level Exceeded
1.000	SP1	
1.001	MH S200	
2.000	SP2	
1.002	MH S201	
1.003	MH S202	

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
3.000	SP3	960 Winter	100	+40%	100/15 Summer	100/240 Winter			12.344	0.729	40.443	0.08			2.1
4.000	SP4	960 Winter	100	+40%	100/15 Summer	100/240 Winter			12.344	0.694	45.193	0.09			3.3
3.001	MH S203	960 Winter	100	+40%	100/15 Summer	100/360 Winter			12.345	0.764	16.789	0.05			4.7
5.000	SP5	960 Winter	100	+40%	100/15 Summer	100/360 Winter			12.396	0.796	0.044	0.04			4.5
6.000	SP7	15 Winter	100	+40%	100/15 Summer				12.703	0.748	0.000	1.90			61.2
6.001	MH S206	15 Winter	100	+40%	100/15 Summer				12.456	0.576	0.000	1.78			61.8
7.000	SP6	960 Winter	100	+40%	100/15 Winter				12.382	0.287	0.000	0.05			4.4
6.002	MH S205	960 Winter	100	+40%	100/15 Summer				12.382	0.699	0.000	0.05			9.3
3.002	MH S204	960 Winter	100	+40%	100/15 Summer	100/360 Winter			12.388	0.866	0.000	0.13			16.6
3.003	PI2	960 Winter	100	+40%	100/15 Summer	100/360 Winter			12.404	0.889	0.000	0.13			16.5
8.000	SP8	15 Winter	100	+40%	100/15 Summer				12.504	0.354	0.000	0.76			8.2
8.001	MH S207	15 Winter	100	+40%	100/15 Summer				12.493	0.369	0.000	1.45			50.5
8.002	MH S208	960 Winter	100	+40%	100/15 Summer				12.415	0.363	0.000	0.10			6.8
8.003	MH S209	960 Winter	100	+40%	100/180 Winter				12.416	0.531	0.000	0.06			6.8
1.004	TANK	960 Winter	100	+40%	100/15 Summer				12.413	1.133	0.000	0.18			5.4
1.005	MH S210 (FC)	960 Winter	100	+40%	100/15 Summer	100/360 Winter			12.439	1.167	0.000	0.09			2.9

PN	US/MH Name	Status	Level Exceeded
3.000	SP3	FLOOD	13
4.000	SP4	FLOOD	14
3.001	MH S203	FLOOD	7
5.000	SP5	FLOOD	
6.000	SP7	FLOOD RISK	
6.001	MH S206	SURCHARGED	
7.000	SP6	FLOOD RISK	
6.002	MH S205	FLOOD RISK	
3.002	MH S204	FLOOD RISK	
3.003	PI2	FLOOD RISK	
8.000	SP8	SURCHARGED	

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

PN	US/MH Name	Status	Level Exceeded
8.001	MH S207	SURCHARGED	
8.002	MH S208	SURCHARGED	
8.003	MH S209	FLOOD RISK	
1.004	TANK	FLOOD RISK	
1.005	MH S210 (FC)	FLOOD RISK	

APPENDIX M

HYDRAULIC CURVE DATA

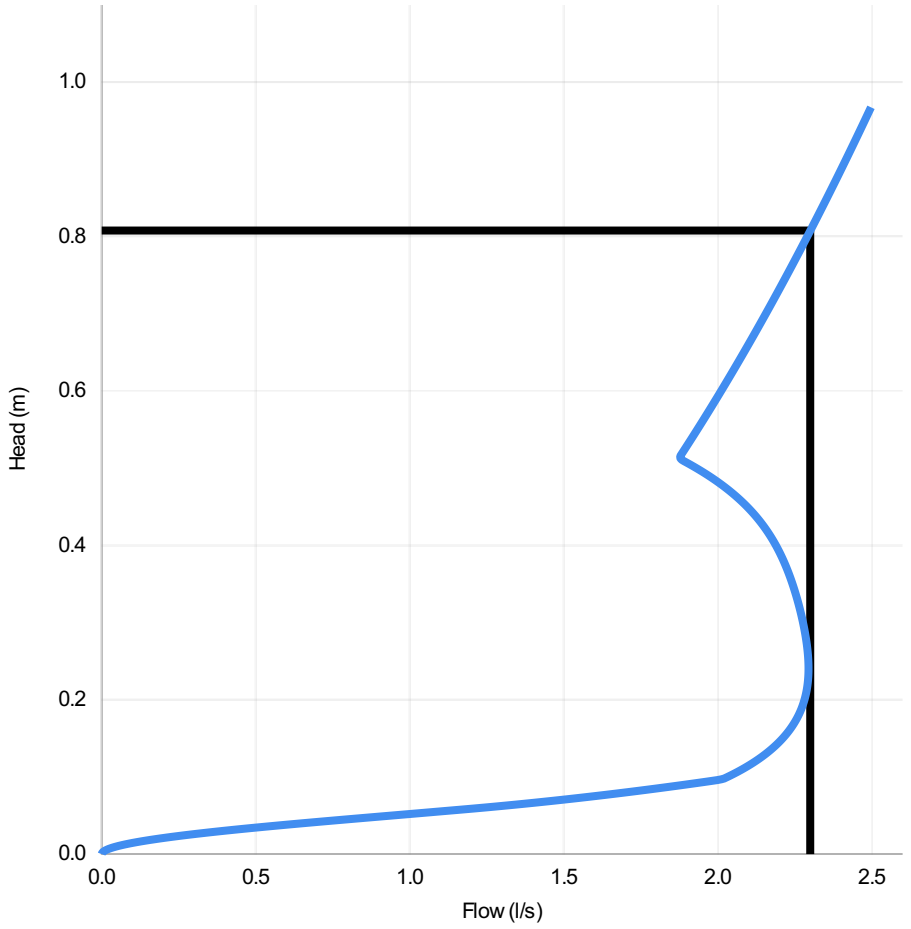
Technical Specification

Control Point	Head (m)	Flow (l/s)
Primary Design	0.808	2.300
Flush-Flo	0.241	2.294
Kick-Flo®	0.512	1.872
Mean Flow		2.006

BBA APPROVAL INSPECTION TESTING CERTIFICATION
CERTIFICATE No 08/4596

WRc APPROVED
PT/329/0412

hydro-int.com/patents



Head (m)	Flow (l/s)
0.000	0.000
0.028	0.342
0.056	1.110
0.084	1.773
0.111	2.086
0.139	2.184
0.167	2.244
0.195	2.277
0.223	2.292
0.251	2.294
0.279	2.286
0.306	2.273
0.334	2.255
0.362	2.232
0.390	2.202
0.418	2.161
0.446	2.106
0.474	2.029
0.502	1.925
0.529	1.900
0.557	1.945
0.585	1.988
0.613	2.030
0.641	2.071
0.669	2.111
0.697	2.151
0.724	2.189
0.752	2.227
0.780	2.264
0.808	2.300

DESIGN ADVICE

The head/flow characteristics of this SHE-0075-2300-0808-2300 Hydro-Brake Optimum® Flow Control are unique. Dynamic hydraulic modelling evaluates the full head/flow characteristic curve.

! **The use of any other flow control will invalidate any design based on this data and could constitute a flood risk.**

Hydro International®

DATE	26/04/2022 14:52
Site	WEYBRIDGE BUSINESS PARK - UNIT 210 & 220
DESIGNER	Joyce John
Ref	

SHE-0075-2300-0808-2300

Hydro-Brake Optimum®

Technical Specification

Control Point	Head (m)	Flow (l/s)
Primary Design	0.808	2.300
Flush-Flo™	0.241	2.294
Kick-Flo®	0.512	1.872
Mean Flow		2.006

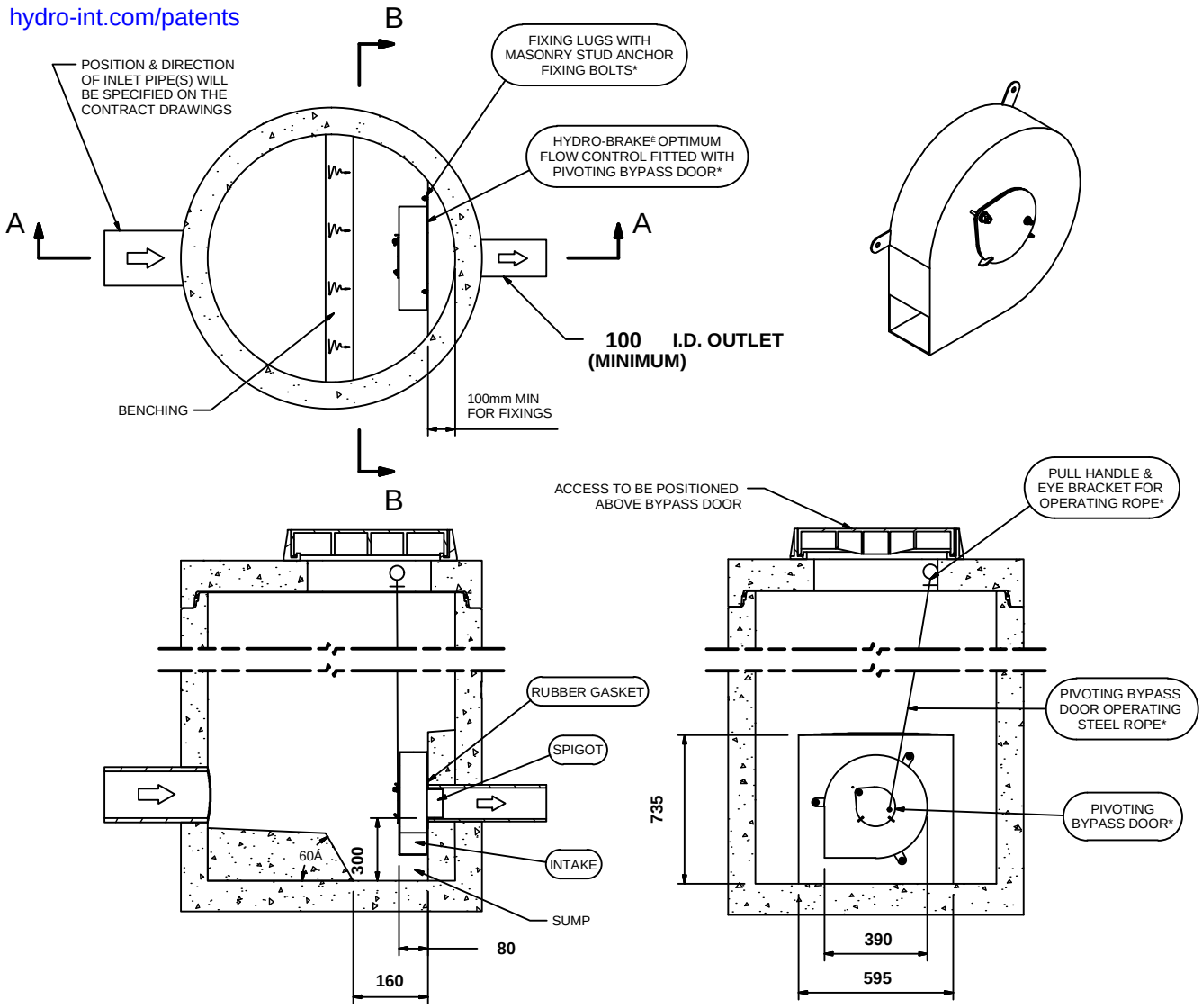
Hydro-Brake® Optimum Flow Control including:

- 3 mm grade 304L stainless steel
- Integral stainless steel pivoting by-pass door allowing clear line of sight through to outlet, c/w stainless steel operating rope
- Beed blasted finish to maximise corrosion resistance
- Stainless steel fixings
- Rubber gasket to seal outlet
- Indicative Weight: 71 kg

BBA APPROVAL INSPECTION TESTING CERTIFICATION CERTIFICATE 08/4596

WRc Approved PT/329/0412

hydro-int.com/patents



SECTION A-A

SECTION B-B

IMPORTANT: ⬭ LIMIT OF HYDRO INTERNATIONAL SUPPLY
THE DEVICE WILL BE HANDED TO SUIT SITE CONDITIONS
FOR SITE SPECIFIC DETAILS AND MINIMUM CHAMBER SIZE REFER TO HYDRO INTERNATIONAL
ALL CIVIL AND INSTALLATION WORK BY OTHERS
* WHERE SUPPLIED
HYDRO-BRAKE® FLOW CONTROL & HYDRO-BRAKE® OPTIMUM FLOW CONTROL ARE REGISTERED TRADEMARKS FOR FLOW CONTROLS DESIGNED AND MANUFACTURED EXCLUSIVELY BY HYDRO INTERNATIONAL

THIS DESIGN LAYOUT IS FOR ILLUSTRATIVE PURPOSES ONLY. NOT TO SCALE.

DESIGN ADVICE

The head/flow characteristics of this SHE-0075-2300-0808-2300 Hydro-Brake® Optimum Flow Control are unique. Dynamic hydraulic modelling evaluates the full head/flow characteristic curve.
The use of any other flow control will invalidate any design based on this data and could constitute a flood risk.

Hydro International®

DATE	4/26/2022 2:52 PM
SITE	WEYBRIDGE BUSINESS PARK - UNIT 210 & 220
DESIGNER	Joyce John
REF	

SHE-0075-2300-0808-2300
Hydro-Brake® Optimum

joyce.john@hdrinc.com

APPENDIX N

ASSESSMENT OF FOUL WATER FLOWS

Preliminary Assessment of Foul Flows - Revision A

Areas taken from UMC Architects drawing 21490-UMC-ZZZZ-SI-M2-A-0602- REV D titled Site Layout
Estimate of peak foul flow based on floor areas:

Floor Areas

SOUTHERN SITE

Unit 100
B8 Warehouse area = 12,527m^2
B1 Office area = 864m^2

Employee Density

From Employment Densities Guide 3rd Edition – November 2015;

B8 storage and distribution (regional distribution centre) = 1 person per 77m^2
12,527m^2 / 77 = 163 people

B1 general offices = 1 person per 12m^2
864m^2 / 12 = 72 people

Total population on site = 235 persons

Foul Water Flows

From British Water – Flows and Loads 2:
Flow loading per person per day = 100 litres per day allowing for a canteen within the unit or flow loading per person per day = 50 litres without a canteen.
For this exercise assume worst case scenario of 100 litres per person per day allowing for canteens.

235 x 100 l/p/day = 23,500 litres

Discharge Rates Based on 12 hour working day:
Note, should working day be 24 hours foul flows will decrease.

DWF = 23,500 / 12 (hour day shift) x 60 x 60 = **0.5 l/sec**

Floor Areas

Unit 210
B8 Warehouse area = 1162m^2
B1 Office area = 162m^2

Unit 220
B8 Warehouse area = 1334m^2
B1 Office area = 208m^2

Total Areas:

B8 Warehouse area = 2496m^2
B1 Office area = 371m^2

Employee Density

From Employment Densities Guide 3rd Edition – November 2015;

B8 storage and distribution (regional distribution centre) = 1 person per 77m^2
2496m^2 / 77 = 32 people

B1 general offices = 1 person per 12m^2
371m^2 / 12 = 31 people

Total population on site = 63 persons

Foul Water Flows

From British Water – Flows and Loads 2:
Flow loading per person per day = 100 litres per day allowing for a canteen within the unit or flow loading per person per day = 50 litres without a canteen.
For this exercise assume worst case scenario of 100 litres per person per day allowing for canteens.

63 x 100 l/p/day = 6300 litres

Discharge Rates Based on 12 hour working day:
Note, should working day be 24 hours foul flows will decrease.

DWF = 6300 / 12 (hour day shift) x 60 x 60 = **0.2 l/sec**

APPENDIX O

THAMES WATER PRE-DEVELOPMENT ENQUIRY

Joyce John

Bourne House
Prince Edward Street
Berkhamsted
Hertfordshire
HP4 3EZ

Wastewater pre-planning
Our ref DS6094190

14 April 2022

Pre-planning enquiry: Confirmation of sufficient capacity

Site: Weybridge, Weybridge Business Park, Addlestone Road, Addlestone, KT152UL

Dear Joyce,

Thank you for providing information on your development.

Proposed demolished Offices (8880m2)
Proposed Offices (1235m2), Warehouse (15023m2)
Existing FW discharge
Northern unit:
Existing 1no. office discharging to existing manhole ref. TQ06642801 TBC
Southern units:
Existing 5no. office units discharging in manhole ref. TQ06643701 TBC

Existing SW discharge
Northern unit:
Existing warehouse facility discharging into watercourse
Impermeable area = 7330m2

Southern units:
Existing 5no. office units discharging in manhole ref. TQ06642753 TBC
Impermeable area = 22889 m2

Proposed FW discharge
Northern unit split Warehouse area (2496m2), office area (371m2), employee density 63 ppl. FW discharge 0.2l/s into TQ06642801
Southern unit split Warehouse area (12527m2), office area (864m2), employee density 235 ppl. FW discharge at 0.5 l/s into TQ06643701

Proposed SW discharge
Northern unit into watercourse
Southern unit Impermeable area = 21923m2
Proposed discharging into manhole ref. TQ06642753 at 7.5 l/sec Based on Greenfield QBAR discharge rate of 3.4l/s/ha.

We have completed the assessment of the foul water flows and surface water run-off based on the information submitted in your application with the purpose of assessing sewerage capacity within the existing Thames Water sewer network.

Foul Water

If your proposals progress in line with the details you've provided, we're pleased to confirm that there will be sufficient sewerage capacity in the adjacent foul water sewer network to serve your development.

This confirmation is valid for 12 months or for the life of any planning approval that this information is used to support, to a maximum of three years.

You'll need to keep us informed of any changes to your design – for example, an increase in the number or density of homes. Such changes could mean there is no longer sufficient capacity.

Surface Water

In accordance with the Building Act 2000 Clause H3.3, positive connection of surface water to a public sewer will only be consented when it can be demonstrated that the hierarchy of disposal methods have been examined and proven to be impracticable. Before we can consider your surface water needs, you'll need written approval from the lead local flood authority that you have followed the sequential approach to the disposal of surface water and considered all practical means.

When developing a site, policy SI 13 of the London Plan states "Development proposals should aim to achieve greenfield run-off rates and ensure that surface water run-off is managed as close to its source as possible. There should also be a preference for green over grey features, in line with the following drainage hierarchy:"

The disposal hierarchy being:

1. rainwater use as a resource (for example rainwater harvesting, blue roofs for irrigation)
2. rainwater infiltration to ground at or close to source
3. rainwater attenuation in green infrastructure features for gradual release (for example green roofs, rain gardens)
4. rainwater discharge direct to a watercourse (unless not appropriate)
5. controlled rainwater discharge to a surface water sewer or drain
6. controlled rainwater discharge to a combined sewer

Where connection to the public sewerage network is still required to manage surface water flows, we will accept these flows at a discharge rate in line with CIRIA's best practice guide on SuDS or that stated within the sites planning approval.

If the above surface water hierarchy has been followed and if the flows are restricted to a total of 7.5 l/s for all storm event up to and including 1 in 100yr +40% CC, then Thames Water would not have any objections to the proposal.

Please see the attached 'Planning your wastewater' leaflet for additional information.

What happens next?

Please make sure you submit your connection application, giving us at least 21 days' notice of the date you wish to make your new connection/s.

If you have any further questions, please contact me on 0774 764 6498.

Kind Regards,

Long Tran
Developer Services – Adoptions Engineer, Sewer Adoptions Team
Tel: 0800 009 3921
Get advice on making your sewer connection correctly at connectright.org.uk
Clearwater Court, Vastern Road, Reading, RG1 8DB
Find us online at developers.thameswater.co.uk