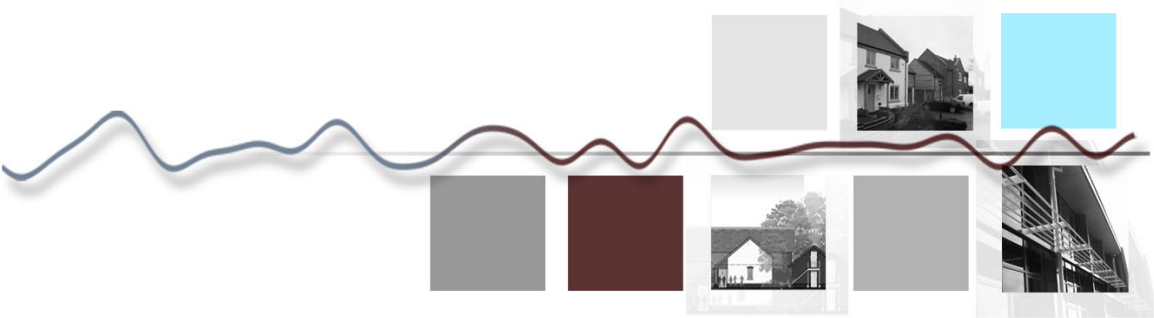


proposed leisure facilities | on behalf of Mr. D. Fletcher



app doc 4a: drainage design
prepared by JNM Engineering Ltd

proposed leisure facilities
Land opposite the Hand and Diamond public house
Coedway, Powys

Barn 5a, Sutton Hall Farm
Sutton Maddock
Shropshire
TF11 9NQ

t: 01952 730 492 w: www.mtcplanning-design.co.uk



THIS DRAWING MAY BE USED ONLY FOR THE PURPOSE INTENDED AND ONLY WRITTEN DIMENSIONS SHALL BE USED

- NOTES:**
- ALL DIMENSIONS IN METRES UNLESS STATED OTHERWISE.
 - ALL PRIVATE DRAINAGE WORKS ARE TO COMPLY WITH THE REQUIREMENTS OF BS 752 BUILDING DRAINAGE AND BUILDING REGULATIONS 2010 APPROVED DOCUMENT H 2002 EDITION. ALL ADOPTABLE DRAINAGE TO COMPLY WITH THE REQUIREMENTS OF SEVERN TREAT WATER AND SEWERS FOR ADOPTION (7th EDITION), INCLUDING THE RELEVANT PROVISIONS OF THE COMBINED ADDENDUM.
 - ALL MATERIALS, UNLESS SPECIFIED OTHERWISE, SHALL COMPLY WITH THE RELEVANT BRITISH STANDARD. SOURCES OF MATERIALS ARE TO BE AGREED WITH THE EMPLOYER'S REPRESENTATIVE/ENGINEER IN ADVANCE OF THE WORKS.
 - ANY DISCREPANCIES IN THE DETAILS SHOWN TO BE REPORTED TO THE EMPLOYER'S REPRESENTATIVE/ENGINEER PRIOR TO CONSTRUCTION.
 - ALL EXISTING SERVICES TO BE LOCATED PRIOR TO THE COMMENCEMENT OF ANY DRAINAGE WORKS WHERE NECESSARY PROTECTION OR DIVERSIONS TO BE UNDERTAKEN TO AVOID CONFLICT WITH THE PROPOSED WORKS.
 - TYPICAL PIPE BEDDING TO DRAINAGE WHERE DEPTH TO SOFFIT IS GREATER THAN 600mm IN LANDSCAPED AREAS AND GREATER THAN 1200mm IN ADOPTABLE HIGHWAYS AND 900mm IN OTHER TRAFFICKED AREAS IS TO BE CLASS S (I.E. 10-14mm GRADED IMPORTED GRANULAR BED AND SURROUND FOR PIPES UP TO 525 DIA AND 20-40mm GRADED IMPORTED GRANULAR BED AND SURROUND FOR PIPES GREATER THAN 525 DIA)
 - BACKFILL TO DRAINAGE TRENCHES UNDER CARRIAGEWAYS TO BE TYPE 1 SUB-BASE MATERIAL. ELSEWHERE BACKFILL TO BE FREE DRAINING READILY COMPATIBLE MATERIAL, FREE FROM RUBBISH AND ORGANIC MATTER, FROZEN SOIL CLAY LUMPS AND LARGE STONES. TO BE COMPACTED IN LAYERS NOT EXCEEDING 150mm THICK.
 - A FLEXIBLE JOINT SHALL BE PROVIDED AS CLOSE AS IS FEASIBLE TO THE SIDE FACE OF ANY STRUCTURE INTO WHICH A PIPE IS BUILT, COMPATIBLE WITH THE SATISFACTORY COMPLETION AND SUBSEQUENT MOVEMENT OF THE JOINT. THE LENGTH OF THE NEXT PIPE (ROCKETS) TO BE COMPACTION FROM THE STRUCTURE SHALL BE AS SHOWN IN THE TABLE BELOW.

NOMINAL DIAMETER (mm)	EFFECTIVE LENGTH (m)
150-600	0.6

- SVP AND RW/P POINTS TO BE CONFIRMED PRIOR TO CONSTRUCTION
- IF ANY INFORMATION ON SITE DIFFERS FROM THE DETAILS ON DRAWINGS JNM ENGINEERING LTD MUST BE INFORMED IMMEDIATELY
- DRAWING FOR PLANNING PURPOSES ONLY
- FINISHED EXTERNAL LEVELS TO BE CONFIRMED ON RECEIPT OF PROPOSED LEVEL DRAWINGS
- EXISTING ROAD LEVELS TO BE CONFIRMED

- KEY:**
- 600mm (DIA MH) PRIVATE SURFACE WATER SEWER. PLEASE CHECK STORM NETWORK TABLE 1.
 - RODDING EYE
 - 1200mm (DIA MH) PRIVATE FOUL SEWER. PIPE TO BE 100mm IN DIAMETER AND MANHOLE TO BE POLYTHENE 450mm IN DIAMETER UP TO 1m DEPTH.
 - 1200mm (DIA MH) PRIVATE COMBINED SEWER. PLEASE REFER TO STORM NETWORK TABLE 1.

HEADWALL

Revision	Details	By	Check	Date	Suffix

Drawing Number: **J02058/A1/001**

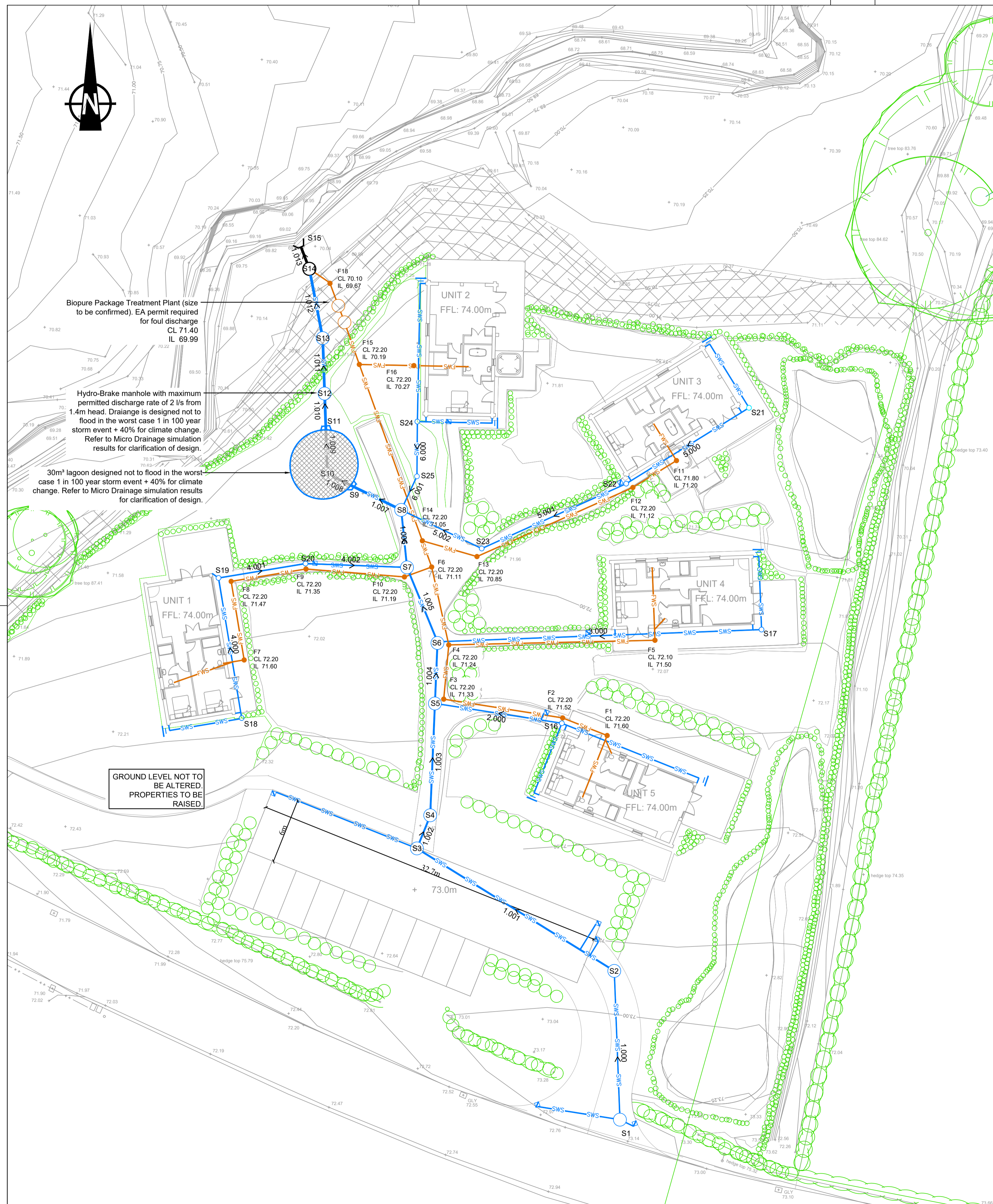
COEDWAY POWYS

Drawing Title: **PROPOSED PLANNING DRAINAGE LAYOUT**

Scale at A1	Detailed	Approved
1:200		James Mew's
Drawn	Tech Chk	Det Chk
RAW	JJM	
Date	29.04.22	

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info@jnmengineering.co.uk
Company Registration Number: 05782540




Biopure Package Treatment Plant (size to be confirmed). EA permit required for foul discharge CL 71.40 IL 69.99

Hydro-Brake manhole with maximum permitted discharge rate of 2 l/s from 1.4m head. Drainage is designed not to flood in the worst case 1 in 100 year storm event + 40% for climate change. Refer to Micro Drainage simulation results for clarification of design.

30m³ lagoon designed not to flood in the worst case 1 in 100 year storm event + 40% for climate change. Refer to Micro Drainage simulation results for clarification of design.

GROUND LEVEL NOT TO BE ALTERED. PROPERTIES TO BE RAISED

Pipe Code	Diameter (mm)	Gradient (1:)	Pipe Length	Upstream Manhole			Downstream Manhole		
				Number	Invert	Cover	Number	Invert	Cover
1.000	100	40	15.494	S1	72.20	73.10	S2	71.81	72.90
1.001	100	40	21.440	S2	71.81	72.90	S3	71.28	72.60
1.002	100	40	3.291	S3	71.28	72.60	S4	71.19	72.45
1.003	100	39	10.327	S4	71.19	72.45	S5	70.93	72.10
1.004	100	40	5.587	S5	70.93	72.10	S6	70.79	72.10
1.005	150	40	7.518	S6	70.74	72.10	S7	70.55	72.00
1.006	150	40	5.332	S7	70.55	72.00	S8	70.42	71.85
1.007	225	300	2.466	S8	70.34	71.85	S9	70.33	71.85
1.008	225	200	5.114	S9	70.33	71.85	S10	70.31	71.75
1.009	225	200	5.523	S10	70.31	71.75	S11	70.28	71.75
1.010	225	200	1.898	S11	70.28	71.75	S12	70.27	71.75
1.011	225	15	5.119	S12	70.27	71.75	S13	69.93	70.50
1.012	225	15	6.507	S13	69.93	70.50	S14	69.50	70.00
1.013	225	40	2.525	S14	69.50	70.00	S15	69.43	69.90
2.000	100	80	11.861	S16	71.08	72.25	S5	70.93	72.10
3.000	100	78	29.942	S17	71.17	72.00	S6	70.79	72.10
4.000	100	80	13.100	S18	71.09	72.20	S19	70.92	72.10
4.001	100	80	8.142	S19	70.92	72.10	S20	70.82	72.10
4.002	100	43	9.375	S20	70.82	72.10	S7	70.60	72.00
5.000	100	80	13.325	S21	71.00	71.50	S22	70.83	71.75
5.001	100	80	14.620	S22	70.83	71.75	S23	70.65	72.00
5.002	100	44	8.239	S23	70.65	72.00	S8	70.47	71.85
6.000	100	80	5.049	S24	70.57	71.75	S25	70.51	71.75
6.001	100	78	3.422	S25	70.51	71.75	S8	70.47	71.85

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STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for COEDWAY.SWS

Pipe Sizes COEDWAY Manhole Sizes COEDWAY

FSR Rainfall Model - England and Wales

Return Period (years)	100	PIMP (%)	100
M5-60 (mm)	18.000	Add Flow / Climate Change (%)	40
Ratio R	0.350	Minimum Backdrop Height (m)	0.200
Maximum Rainfall (mm/hr)	50	Maximum Backdrop Height (m)	0.000
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	1.200
Foul Sewage (l/s/ha)	0.000	Min Vel for Auto Design only (m/s)	0.75
Volumetric Runoff Coeff.	0.750	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Network Design Table for COEDWAY.SWS

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	15.494	0.387	40.0	0.000	5.00	0.0	0.600	o	100	Pipe/Conduit
1.001	21.440	0.536	40.0	0.043	0.00	0.0	0.600	o	150	Pipe/Conduit
1.002	3.291	0.082	40.1	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit
1.003	10.327	0.267	38.7	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit
2.000	11.861	0.148	80.1	0.008	5.00	0.0	0.600	o	100	Pipe/Conduit
1.004	5.587	0.140	39.9	0.004	0.00	0.0	0.600	o	150	Pipe/Conduit
3.000	29.942	0.383	78.2	0.008	5.00	0.0	0.600	o	100	Pipe/Conduit
1.005	7.519	0.188	40.0	0.003	0.00	0.0	0.600	o	150	Pipe/Conduit

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	E I.Area (ha)	E Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.000	50.00	5.21	72.200	0.000	0.0	0.0	0.0	1.22	9.6	0.0
1.001	50.00	5.44	71.763	0.043	0.0	0.0	2.3	1.60	28.2	8.2
1.002	50.00	5.47	71.227	0.043	0.0	0.0	2.3	1.59	28.2	8.2
1.003	50.00	5.58	71.145	0.043	0.0	0.0	2.3	1.62	28.7	8.2
2.000	50.00	5.23	71.076	0.008	0.0	0.0	0.4	0.86	6.8	1.5
1.004	50.00	5.63	70.878	0.055	0.0	0.0	3.0	1.60	28.2	10.4
3.000	50.00	5.57	71.171	0.008	0.0	0.0	0.4	0.87	6.8	1.5
1.005	50.00	5.71	70.738	0.066	0.0	0.0	3.6	1.60	28.2	12.5

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Network Design Table for COEDWAY.SWS

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
4.000	13.100	0.164	79.9	0.008	5.00	0.0	0.600	o	100	Pipe/Conduit
4.001	8.142	0.102	79.8	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit
4.002	9.375	0.220	42.6	0.001	0.00	0.0	0.600	o	100	Pipe/Conduit
1.006	5.333	0.134	39.8	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit
5.000	13.325	0.167	79.8	0.008	5.00	0.0	0.600	o	100	Pipe/Conduit
5.001	14.620	0.183	79.9	0.002	0.00	0.0	0.600	o	100	Pipe/Conduit
5.002	8.239	0.186	44.3	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit
6.000	5.050	0.063	80.2	0.009	5.00	0.0	0.600	o	100	Pipe/Conduit
6.001	3.422	0.044	77.8	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit
1.007	2.466	0.008	300.0	0.007	0.00	0.0	0.600	o	225	Pipe/Conduit
1.008	5.114	0.026	200.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit
1.009	5.523	0.028	200.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit
1.010	1.898	0.009	200.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit
1.011	5.119	0.341	15.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit
1.012	6.507	0.434	15.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit
1.013	2.525	0.063	40.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
4.000	50.00	5.25	71.086	0.008	0.0	0.0	0.4	0.86	6.8	1.5
4.001	50.00	5.41	70.922	0.008	0.0	0.0	0.4	0.86	6.8	1.5
4.002	50.00	5.54	70.820	0.009	0.0	0.0	0.5	1.18	9.3	1.7
1.006	50.00	5.77	70.550	0.075	0.0	0.0	4.1	1.60	28.3	14.2
5.000	50.00	5.26	71.002	0.008	0.0	0.0	0.4	0.86	6.8	1.5
5.001	50.00	5.54	70.835	0.010	0.0	0.0	0.5	0.86	6.8	1.9
5.002	50.00	5.66	70.652	0.010	0.0	0.0	0.5	1.16	9.1	1.9
6.000	50.00	5.10	70.573	0.009	0.0	0.0	0.5	0.86	6.8	1.7
6.001	50.00	5.16	70.510	0.009	0.0	0.0	0.5	0.87	6.9	1.7
1.007	50.00	5.82	70.341	0.101	0.0	0.0	5.5	0.75	29.8	19.1
1.008	50.00	5.92	70.333	0.101	0.0	0.0	5.5	0.92	36.6	19.1
1.009	50.00	6.02	70.307	0.101	0.0	0.0	5.5	0.92	36.6	19.1
1.010	50.00	6.05	70.280	0.101	0.0	0.0	5.5	0.92	36.6	19.1
1.011	50.00	6.07	70.270	0.101	0.0	0.0	5.5	3.39	135.0	19.1
1.012	50.00	6.11	69.929	0.101	0.0	0.0	5.5	3.40	135.1	19.1
1.013	50.00	6.13	69.495	0.101	0.0	0.0	5.5	2.07	82.5	19.1



Manhole Schedules for COEDWAY.SWS

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	Pipe Out		Pipes In			Backdrop (mm)
					PN	Invert Level (m)	Diameter (mm)	PN	Invert Level (m)	
1	73.100	0.900	Open Manhole	450	1.000	72.200	100			
2	72.900	1.137	Open Manhole	1200	1.001	71.763	150	1.000	71.813	100
3	72.600	1.373	Open Manhole	1200	1.002	71.227	150	1.001	71.227	150
4	72.450	1.305	Open Manhole	1200	1.003	71.145	150	1.002	71.145	150
16	72.250	1.174	Open Manhole	450	2.000	71.076	100			
5	72.100	1.222	Open Manhole	600	1.004	70.878	150	1.003	70.878	150
								2.000	70.928	100
17	72.000	0.829	Open Manhole	450	3.000	71.171	100			
6	72.100	1.362	Open Manhole	600	1.005	70.738	150	1.004	70.738	150
								3.000	70.788	100
18	72.200	1.114	Open Manhole	450	4.000	71.086	100			
19	72.100	1.178	Open Manhole	450	4.001	70.922	100	4.000	70.922	100
20	72.100	1.280	Open Manhole	450	4.002	70.820	100	4.001	70.820	100
7	72.000	1.450	Open Manhole	1200	1.006	70.550	150	1.005	70.550	150
								4.002	70.600	100
21	71.500	0.498	Open Manhole	450	5.000	71.002	100			
22	71.750	0.915	Open Manhole	450	5.001	70.835	100	5.000	70.835	100
23	72.000	1.348	Open Manhole	450	5.002	70.652	100	5.001	70.652	100
24	71.750	1.177	Open Manhole	450	6.000	70.573	100			
25	71.750	1.240	Open Manhole	450	6.001	70.510	100	6.000	70.510	100
8	71.850	1.509	Open Manhole	1200	1.007	70.341	225	1.006	70.416	150
								5.002	70.466	100
								6.001	70.466	100
9	71.850	1.517	Open Manhole	1200	1.008	70.333	225	1.007	70.333	225
10	71.750	1.443	Open Manhole	1200	1.009	70.307	225	1.008	70.307	225
11	71.750	1.470	Open Manhole	1200	1.010	70.280	225	1.009	70.280	225
12	71.750	1.480	Open Manhole	1200	1.011	70.270	225	1.010	70.270	225
13	70.500	0.571	Open Manhole	1200	1.012	69.929	225	1.011	69.929	225
14	70.000	0.505	Open Manhole	1200	1.013	69.495	225	1.012	69.495	225
15	69.900	0.468	Open Manhole	0		OUTFALL		1.013	69.432	225

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
1	-396962.638	-307552.133	-396962.638	-307552.133	Required	●

14-16 High Street
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LAND AT COEDWAY
POWYS



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Manhole Schedules for COEDWAY.SWS

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
2	-396963.225	-307536.650	-396963.225	-307536.650	Required	
3	-396981.444	-307525.349	-396981.444	-307525.349	Required	
4	-396980.217	-307522.295	-396980.217	-307522.295	Required	
16	-396968.062	-307513.801	-396968.062	-307513.801	Required	
5	-396979.782	-307511.977	-396979.782	-307511.977	Required	
17	-396949.629	-307505.159	-396949.629	-307505.159	Required	
6	-396979.546	-307506.394	-396979.546	-307506.394	Required	
18	-396997.622	-307513.320	-396997.622	-307513.320	Required	
19	-396999.759	-307500.395	-396999.759	-307500.395	Required	
20	-396991.727	-307499.066	-396991.727	-307499.066	Required	
7	-396982.358	-307499.421	-396982.358	-307499.421	Required	
21	-396950.786	-307484.694	-396950.786	-307484.694	Required	
22	-396962.124	-307491.695	-396962.124	-307491.695	Required	
23	-396975.464	-307497.678	-396975.464	-307497.678	Required	
24	-396981.404	-307485.968	-396981.404	-307485.968	Required	

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LAND AT COEDWAY
 POWYS



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Network 2019.1

Manhole Schedules for COEDWAY.SWS

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
25	-396981.442	-307491.017	-396981.442	-307491.017	Required	
8	-396982.893	-307494.116	-396982.893	-307494.116	Required	
9	-396985.110	-307493.037	-396985.110	-307493.037	Required	
10	-396989.708	-307490.798	-396989.708	-307490.798	Required	
11	-396989.899	-307485.279	-396989.899	-307485.279	Required	
12	-396989.964	-307483.382	-396989.964	-307483.382	Required	
13	-396990.141	-307478.266	-396990.141	-307478.266	Required	
14	-396991.375	-307471.877	-396991.375	-307471.877	Required	
15	-396992.275	-307469.517			No Entry	

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PIPELINE SCHEDULES for COEDWAY.SWS

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	100	1	73.100	72.200	0.800	Open Manhole	450
1.001	o	150	2	72.900	71.763	0.987	Open Manhole	1200
1.002	o	150	3	72.600	71.227	1.223	Open Manhole	1200
1.003	o	150	4	72.450	71.145	1.155	Open Manhole	1200
2.000	o	100	16	72.250	71.076	1.074	Open Manhole	450
1.004	o	150	5	72.100	70.878	1.072	Open Manhole	600
3.000	o	100	17	72.000	71.171	0.729	Open Manhole	450
1.005	o	150	6	72.100	70.738	1.212	Open Manhole	600
4.000	o	100	18	72.200	71.086	1.014	Open Manhole	450
4.001	o	100	19	72.100	70.922	1.078	Open Manhole	450
4.002	o	100	20	72.100	70.820	1.180	Open Manhole	450
1.006	o	150	7	72.000	70.550	1.300	Open Manhole	1200
5.000	o	100	21	71.500	71.002	0.398	Open Manhole	450
5.001	o	100	22	71.750	70.835	0.815	Open Manhole	450

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	15.494	40.0	2	72.900	71.813	0.987	Open Manhole	1200
1.001	21.440	40.0	3	72.600	71.227	1.223	Open Manhole	1200
1.002	3.291	40.1	4	72.450	71.145	1.155	Open Manhole	1200
1.003	10.327	38.7	5	72.100	70.878	1.072	Open Manhole	600
2.000	11.861	80.1	5	72.100	70.928	1.072	Open Manhole	600
1.004	5.587	39.9	6	72.100	70.738	1.212	Open Manhole	600
3.000	29.942	78.2	6	72.100	70.788	1.212	Open Manhole	600
1.005	7.519	40.0	7	72.000	70.550	1.300	Open Manhole	1200
4.000	13.100	79.9	19	72.100	70.922	1.078	Open Manhole	450
4.001	8.142	79.8	20	72.100	70.820	1.180	Open Manhole	450
4.002	9.375	42.6	7	72.000	70.600	1.300	Open Manhole	1200
1.006	5.333	39.8	8	71.850	70.416	1.284	Open Manhole	1200
5.000	13.325	79.8	22	71.750	70.835	0.815	Open Manhole	450
5.001	14.620	79.9	23	72.000	70.652	1.248	Open Manhole	450

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PIPELINE SCHEDULES for COEDWAY.SWS

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)
5.002	o	100	23	72.000	70.652	1.248	Open Manhole	450
6.000	o	100	24	71.750	70.573	1.077	Open Manhole	450
6.001	o	100	25	71.750	70.510	1.140	Open Manhole	450
1.007	o	225	8	71.850	70.341	1.284	Open Manhole	1200
1.008	o	225	9	71.850	70.333	1.292	Open Manhole	1200
1.009	o	225	10	71.750	70.307	1.218	Open Manhole	1200
1.010	o	225	11	71.750	70.280	1.245	Open Manhole	1200
1.011	o	225	12	71.750	70.270	1.255	Open Manhole	1200
1.012	o	225	13	70.500	69.929	0.346	Open Manhole	1200
1.013	o	225	14	70.000	69.495	0.280	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)
5.002	8.239	44.3	8	71.850	70.466	1.284	Open Manhole	1200
6.000	5.050	80.2	25	71.750	70.510	1.140	Open Manhole	450
6.001	3.422	77.8	8	71.850	70.466	1.284	Open Manhole	1200
1.007	2.466	300.0	9	71.850	70.333	1.292	Open Manhole	1200
1.008	5.114	200.0	10	71.750	70.307	1.218	Open Manhole	1200
1.009	5.523	200.0	11	71.750	70.280	1.245	Open Manhole	1200
1.010	1.898	200.0	12	71.750	70.270	1.255	Open Manhole	1200
1.011	5.119	15.0	13	70.500	69.929	0.346	Open Manhole	1200
1.012	6.507	15.0	14	70.000	69.495	0.280	Open Manhole	1200
1.013	2.525	40.0	15	69.900	69.432	0.243	Open Manhole	0

Free Flowing Outfall Details for COEDWAY.SWS

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D, L (mm)	W (mm)
1.013	15	69.900	69.432	0.000	0	0


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Simulation Criteria for COEDWAY.SWS

Volumetric Runoff Coeff	0.840	Foul Sewage per hectare (l/s)	0.000	
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	40.000	
Hot Start (mins)	0	MADD Factor * 10m ³ /ha Storage	0.000	
Hot Start Level (mm)	0	Run Time (mins)	240	
Manhole Headloss Coeff (Global)	0.500	Output Interval (mins)	4	
Number of Input Hydrographs		0	Number of Storage Structures	1
Number of Online Controls		1	Number of Time/Area Diagrams	0
Number of Offline Controls		0		

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Winter
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	18.000	Storm Duration (mins)	120
Ratio R	0.350		

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Online Controls for COEDWAY.SWS


Hydro-Brake® Optimum Manhole: 12, DS/PN: 1.011, Volume (m³): 1.7

Unit Reference	MD-SHE-0063-2000-1300-2000
Design Head (m)	1.300
Design Flow (l/s)	2.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	63
Invert Level (m)	70.270
Minimum Outlet Pipe Diameter (mm)	100
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.300	2.0
Flush-Flo™	0.280	1.7
Kick-Flo®	0.564	1.4
Mean Flow over Head Range	-	1.6

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)
0.100	1.4	1.200	1.9	3.000	2.9	7.000	4.4
0.200	1.7	1.400	2.1	3.500	3.2	7.500	4.5
0.300	1.7	1.600	2.2	4.000	3.4	8.000	4.6
0.400	1.6	1.800	2.3	4.500	3.5	8.500	4.8
0.500	1.5	2.000	2.4	5.000	3.7	9.000	4.9
0.600	1.4	2.200	2.5	5.500	3.9	9.500	5.0
0.800	1.6	2.400	2.6	6.000	4.1		
1.000	1.8	2.600	2.7	6.500	4.2		


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Storage Structures for COEDWAY.SWS

Tank or Pond Manhole: 10, DS/PN: 1.009

Invert Level (m) 70.308


Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	30.0	1.000	30.0	1.001	0.0

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Summary of Results for 120 minute 100 year Winter (COEDWAY.SWS)

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

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m ³)	Flow / Overflow Cap. (l/s)	Pipe Flow (l/s)	Status
1.000	1	72.200	-0.100	0.000	0.00	0.0	OK
1.001	2	71.818	-0.095	0.000	0.30	7.9	OK
1.002	3	71.538	0.161	0.000	0.44	7.9	SURCHARGED
1.003	4	71.536	0.241	0.000	0.31	7.9	SURCHARGED
2.000	16	71.534	0.358	0.000	0.23	1.5	SURCHARGED
1.004	5	71.532	0.504	0.000	0.42	9.8	SURCHARGED
3.000	17	71.533	0.262	0.000	0.22	1.5	SURCHARGED
1.005	6	71.529	0.641	0.000	0.46	11.2	SURCHARGED
4.000	18	71.530	0.344	0.000	0.23	1.5	SURCHARGED
4.001	19	71.528	0.506	0.000	0.23	1.4	SURCHARGED
4.002	20	71.526	0.606	0.000	0.17	1.5	SURCHARGED
1.006	7	71.525	0.825	0.000	0.53	12.0	SURCHARGED
5.000	21	71.494	0.392	0.000	0.23	1.5	FLOOD RISK
5.001	22	71.504	0.569	0.000	0.27	1.8	FLOOD RISK
5.002	23	71.513	0.761	0.000	0.17	1.5	SURCHARGED
6.000	24	71.523	0.850	0.000	0.26	1.6	FLOOD RISK
6.001	25	71.521	0.911	0.000	0.26	1.5	FLOOD RISK
1.007	8	71.521	0.955	0.000	0.57	15.8	SURCHARGED
1.008	9	71.520	0.962	0.000	0.57	15.3	SURCHARGED
1.009	10	71.518	0.986	0.000	0.10	2.6	FLOOD RISK
1.010	11	71.516	1.012	0.000	0.07	2.2	FLOOD RISK
1.011	12	71.516	1.021	0.000	0.02	2.0	FLOOD RISK
1.012	13	69.952	-0.203	0.000	0.02	2.0	OK
1.013	14	69.529	-0.191	0.000	0.06	2.0	OK

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STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for COEDWAY.SWS

Pipe Sizes COEDWAY Manhole Sizes COEDWAY

FSR Rainfall Model - England and Wales

Return Period (years)	100	PIMP (%)	100
M5-60 (mm)	18.000	Add Flow / Climate Change (%)	40
Ratio R	0.350	Minimum Backdrop Height (m)	0.200
Maximum Rainfall (mm/hr)	50	Maximum Backdrop Height (m)	0.000
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	1.200
Foul Sewage (l/s/ha)	0.000	Min Vel for Auto Design only (m/s)	0.75
Volumetric Runoff Coeff.	0.750	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Network Design Table for COEDWAY.SWS

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	15.494	0.387	40.0	0.000	5.00	0.0	0.600	o	100	Pipe/Conduit
1.001	21.440	0.536	40.0	0.043	0.00	0.0	0.600	o	150	Pipe/Conduit
1.002	3.291	0.082	40.1	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit
1.003	10.327	0.267	38.7	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit
2.000	11.861	0.148	80.1	0.008	5.00	0.0	0.600	o	100	Pipe/Conduit
1.004	5.587	0.140	39.9	0.004	0.00	0.0	0.600	o	150	Pipe/Conduit
3.000	29.942	0.383	78.2	0.008	5.00	0.0	0.600	o	100	Pipe/Conduit
1.005	7.519	0.188	40.0	0.003	0.00	0.0	0.600	o	150	Pipe/Conduit

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	E I.Area (ha)	E Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.000	50.00	5.21	72.200	0.000	0.0	0.0	0.0	1.22	9.6	0.0
1.001	50.00	5.44	71.763	0.043	0.0	0.0	2.3	1.60	28.2	8.2
1.002	50.00	5.47	71.227	0.043	0.0	0.0	2.3	1.59	28.2	8.2
1.003	50.00	5.58	71.145	0.043	0.0	0.0	2.3	1.62	28.7	8.2
2.000	50.00	5.23	71.076	0.008	0.0	0.0	0.4	0.86	6.8	1.5
1.004	50.00	5.63	70.878	0.055	0.0	0.0	3.0	1.60	28.2	10.4
3.000	50.00	5.57	71.171	0.008	0.0	0.0	0.4	0.87	6.8	1.5
1.005	50.00	5.71	70.738	0.066	0.0	0.0	3.6	1.60	28.2	12.5

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Network Design Table for COEDWAY.SWS

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
4.000	13.100	0.164	79.9	0.008	5.00	0.0	0.600	o	100	Pipe/Conduit
4.001	8.142	0.102	79.8	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit
4.002	9.375	0.220	42.6	0.001	0.00	0.0	0.600	o	100	Pipe/Conduit
1.006	5.333	0.134	39.8	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit
5.000	13.325	0.167	79.8	0.008	5.00	0.0	0.600	o	100	Pipe/Conduit
5.001	14.620	0.183	79.9	0.002	0.00	0.0	0.600	o	100	Pipe/Conduit
5.002	8.239	0.186	44.3	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit
6.000	5.050	0.063	80.2	0.009	5.00	0.0	0.600	o	100	Pipe/Conduit
6.001	3.422	0.044	77.8	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit
1.007	2.466	0.008	300.0	0.007	0.00	0.0	0.600	o	225	Pipe/Conduit
1.008	5.114	0.026	200.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit
1.009	5.523	0.028	200.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit
1.010	1.898	0.009	200.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit
1.011	5.119	0.341	15.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit
1.012	6.507	0.434	15.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit
1.013	2.525	0.063	40.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
4.000	50.00	5.25	71.086	0.008	0.0	0.0	0.4	0.86	6.8	1.5
4.001	50.00	5.41	70.922	0.008	0.0	0.0	0.4	0.86	6.8	1.5
4.002	50.00	5.54	70.820	0.009	0.0	0.0	0.5	1.18	9.3	1.7
1.006	50.00	5.77	70.550	0.075	0.0	0.0	4.1	1.60	28.3	14.2
5.000	50.00	5.26	71.002	0.008	0.0	0.0	0.4	0.86	6.8	1.5
5.001	50.00	5.54	70.835	0.010	0.0	0.0	0.5	0.86	6.8	1.9
5.002	50.00	5.66	70.652	0.010	0.0	0.0	0.5	1.16	9.1	1.9
6.000	50.00	5.10	70.573	0.009	0.0	0.0	0.5	0.86	6.8	1.7
6.001	50.00	5.16	70.510	0.009	0.0	0.0	0.5	0.87	6.9	1.7
1.007	50.00	5.82	70.341	0.101	0.0	0.0	5.5	0.75	29.8	19.1
1.008	50.00	5.92	70.333	0.101	0.0	0.0	5.5	0.92	36.6	19.1
1.009	50.00	6.02	70.307	0.101	0.0	0.0	5.5	0.92	36.6	19.1
1.010	50.00	6.05	70.280	0.101	0.0	0.0	5.5	0.92	36.6	19.1
1.011	50.00	6.07	70.270	0.101	0.0	0.0	5.5	3.39	135.0	19.1
1.012	50.00	6.11	69.929	0.101	0.0	0.0	5.5	3.40	135.1	19.1
1.013	50.00	6.13	69.495	0.101	0.0	0.0	5.5	2.07	82.5	19.1



Manhole Schedules for COEDWAY.SWS

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	Pipe Out		Pipes In			Backdrop (mm)
					PN	Invert Level (m)	Diameter (mm)	PN	Invert Level (m)	
1	73.100	0.900	Open Manhole	450	1.000	72.200	100			
2	72.900	1.137	Open Manhole	1200	1.001	71.763	150	1.000	71.813	100
3	72.600	1.373	Open Manhole	1200	1.002	71.227	150	1.001	71.227	150
4	72.450	1.305	Open Manhole	1200	1.003	71.145	150	1.002	71.145	150
16	72.250	1.174	Open Manhole	450	2.000	71.076	100			
5	72.100	1.222	Open Manhole	600	1.004	70.878	150	1.003	70.878	150
								2.000	70.928	100
17	72.000	0.829	Open Manhole	450	3.000	71.171	100			
6	72.100	1.362	Open Manhole	600	1.005	70.738	150	1.004	70.738	150
								3.000	70.788	100
18	72.200	1.114	Open Manhole	450	4.000	71.086	100			
19	72.100	1.178	Open Manhole	450	4.001	70.922	100	4.000	70.922	100
20	72.100	1.280	Open Manhole	450	4.002	70.820	100	4.001	70.820	100
7	72.000	1.450	Open Manhole	1200	1.006	70.550	150	1.005	70.550	150
								4.002	70.600	100
21	71.500	0.498	Open Manhole	450	5.000	71.002	100			
22	71.750	0.915	Open Manhole	450	5.001	70.835	100	5.000	70.835	100
23	72.000	1.348	Open Manhole	450	5.002	70.652	100	5.001	70.652	100
24	71.750	1.177	Open Manhole	450	6.000	70.573	100			
25	71.750	1.240	Open Manhole	450	6.001	70.510	100	6.000	70.510	100
8	71.850	1.509	Open Manhole	1200	1.007	70.341	225	1.006	70.416	150
								5.002	70.466	100
								6.001	70.466	100
9	71.850	1.517	Open Manhole	1200	1.008	70.333	225	1.007	70.333	225
10	71.750	1.443	Open Manhole	1200	1.009	70.307	225	1.008	70.307	225
11	71.750	1.470	Open Manhole	1200	1.010	70.280	225	1.009	70.280	225
12	71.750	1.480	Open Manhole	1200	1.011	70.270	225	1.010	70.270	225
13	70.500	0.571	Open Manhole	1200	1.012	69.929	225	1.011	69.929	225
14	70.000	0.505	Open Manhole	1200	1.013	69.495	225	1.012	69.495	225
15	69.900	0.468	Open Manhole	0		OUTFALL		1.013	69.432	225

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
1	-396962.638	-307552.133	-396962.638	-307552.133	Required	●

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 Ironbridge
 Shropshire, TF8 7AD

LAND AT COEDWAY
 POWYS



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Manhole Schedules for COEDWAY.SWS

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
2	-396963.225	-307536.650	-396963.225	-307536.650	Required	
3	-396981.444	-307525.349	-396981.444	-307525.349	Required	
4	-396980.217	-307522.295	-396980.217	-307522.295	Required	
16	-396968.062	-307513.801	-396968.062	-307513.801	Required	
5	-396979.782	-307511.977	-396979.782	-307511.977	Required	
17	-396949.629	-307505.159	-396949.629	-307505.159	Required	
6	-396979.546	-307506.394	-396979.546	-307506.394	Required	
18	-396997.622	-307513.320	-396997.622	-307513.320	Required	
19	-396999.759	-307500.395	-396999.759	-307500.395	Required	
20	-396991.727	-307499.066	-396991.727	-307499.066	Required	
7	-396982.358	-307499.421	-396982.358	-307499.421	Required	
21	-396950.786	-307484.694	-396950.786	-307484.694	Required	
22	-396962.124	-307491.695	-396962.124	-307491.695	Required	
23	-396975.464	-307497.678	-396975.464	-307497.678	Required	
24	-396981.404	-307485.968	-396981.404	-307485.968	Required	

14-16 High Street
Ironbridge
Shropshire, TF8 7AD

LAND AT COEDWAY
POWYS



Date 29/04/2022
File Coedway.MDX


Designed by RAW
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Manhole Schedules for COEDWAY.SWS

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
25	-396981.442	-307491.017	-396981.442	-307491.017	Required	
8	-396982.893	-307494.116	-396982.893	-307494.116	Required	
9	-396985.110	-307493.037	-396985.110	-307493.037	Required	
10	-396989.708	-307490.798	-396989.708	-307490.798	Required	
11	-396989.899	-307485.279	-396989.899	-307485.279	Required	
12	-396989.964	-307483.382	-396989.964	-307483.382	Required	
13	-396990.141	-307478.266	-396990.141	-307478.266	Required	
14	-396991.375	-307471.877	-396991.375	-307471.877	Required	
15	-396992.275	-307469.517			No Entry	

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PIPELINE SCHEDULES for COEDWAY.SWS

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	100	1	73.100	72.200	0.800	Open Manhole	450
1.001	o	150	2	72.900	71.763	0.987	Open Manhole	1200
1.002	o	150	3	72.600	71.227	1.223	Open Manhole	1200
1.003	o	150	4	72.450	71.145	1.155	Open Manhole	1200
2.000	o	100	16	72.250	71.076	1.074	Open Manhole	450
1.004	o	150	5	72.100	70.878	1.072	Open Manhole	600
3.000	o	100	17	72.000	71.171	0.729	Open Manhole	450
1.005	o	150	6	72.100	70.738	1.212	Open Manhole	600
4.000	o	100	18	72.200	71.086	1.014	Open Manhole	450
4.001	o	100	19	72.100	70.922	1.078	Open Manhole	450
4.002	o	100	20	72.100	70.820	1.180	Open Manhole	450
1.006	o	150	7	72.000	70.550	1.300	Open Manhole	1200
5.000	o	100	21	71.500	71.002	0.398	Open Manhole	450
5.001	o	100	22	71.750	70.835	0.815	Open Manhole	450

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	15.494	40.0	2	72.900	71.813	0.987	Open Manhole	1200
1.001	21.440	40.0	3	72.600	71.227	1.223	Open Manhole	1200
1.002	3.291	40.1	4	72.450	71.145	1.155	Open Manhole	1200
1.003	10.327	38.7	5	72.100	70.878	1.072	Open Manhole	600
2.000	11.861	80.1	5	72.100	70.928	1.072	Open Manhole	600
1.004	5.587	39.9	6	72.100	70.738	1.212	Open Manhole	600
3.000	29.942	78.2	6	72.100	70.788	1.212	Open Manhole	600
1.005	7.519	40.0	7	72.000	70.550	1.300	Open Manhole	1200
4.000	13.100	79.9	19	72.100	70.922	1.078	Open Manhole	450
4.001	8.142	79.8	20	72.100	70.820	1.180	Open Manhole	450
4.002	9.375	42.6	7	72.000	70.600	1.300	Open Manhole	1200
1.006	5.333	39.8	8	71.850	70.416	1.284	Open Manhole	1200
5.000	13.325	79.8	22	71.750	70.835	0.815	Open Manhole	450
5.001	14.620	79.9	23	72.000	70.652	1.248	Open Manhole	450

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PIPELINE SCHEDULES for COEDWAY.SWS

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)
5.002	o	100	23	72.000	70.652	1.248	Open Manhole	450
6.000	o	100	24	71.750	70.573	1.077	Open Manhole	450
6.001	o	100	25	71.750	70.510	1.140	Open Manhole	450
1.007	o	225	8	71.850	70.341	1.284	Open Manhole	1200
1.008	o	225	9	71.850	70.333	1.292	Open Manhole	1200
1.009	o	225	10	71.750	70.307	1.218	Open Manhole	1200
1.010	o	225	11	71.750	70.280	1.245	Open Manhole	1200
1.011	o	225	12	71.750	70.270	1.255	Open Manhole	1200
1.012	o	225	13	70.500	69.929	0.346	Open Manhole	1200
1.013	o	225	14	70.000	69.495	0.280	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)
5.002	8.239	44.3	8	71.850	70.466	1.284	Open Manhole	1200
6.000	5.050	80.2	25	71.750	70.510	1.140	Open Manhole	450
6.001	3.422	77.8	8	71.850	70.466	1.284	Open Manhole	1200
1.007	2.466	300.0	9	71.850	70.333	1.292	Open Manhole	1200
1.008	5.114	200.0	10	71.750	70.307	1.218	Open Manhole	1200
1.009	5.523	200.0	11	71.750	70.280	1.245	Open Manhole	1200
1.010	1.898	200.0	12	71.750	70.270	1.255	Open Manhole	1200
1.011	5.119	15.0	13	70.500	69.929	0.346	Open Manhole	1200
1.012	6.507	15.0	14	70.000	69.495	0.280	Open Manhole	1200
1.013	2.525	40.0	15	69.900	69.432	0.243	Open Manhole	0

Free Flowing Outfall Details for COEDWAY.SWS

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D, L (mm)	W (mm)
1.013	15	69.900	69.432	0.000	0	0


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Simulation Criteria for COEDWAY.SWS

Volumetric Runoff Coeff	0.840	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	40.000
Hot Start (mins)	0	MADD Factor * 10m ³ /ha Storage	0.000
Hot Start Level (mm)	0	Run Time (mins)	60
Manhole Headloss Coeff (Global)	0.500	Output Interval (mins)	1
Number of Input Hydrographs		0 Number of Storage Structures	
Number of Online Controls		1 Number of Time/Area Diagrams	
Number of Offline Controls		0	

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Winter
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	18.000	Storm Duration (mins)	15
Ratio R	0.350		

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Online Controls for COEDWAY.SWS


Hydro-Brake® Optimum Manhole: 12, DS/PN: 1.011, Volume (m³): 1.7

Unit Reference	MD-SHE-0063-2000-1300-2000
Design Head (m)	1.300
Design Flow (l/s)	2.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	63
Invert Level (m)	70.270
Minimum Outlet Pipe Diameter (mm)	100
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.300	2.0
Flush-Flo™	0.280	1.7
Kick-Flo®	0.564	1.4
Mean Flow over Head Range	-	1.6

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)
0.100	1.4	1.200	1.9	3.000	2.9	7.000	4.4
0.200	1.7	1.400	2.1	3.500	3.2	7.500	4.5
0.300	1.7	1.600	2.2	4.000	3.4	8.000	4.6
0.400	1.6	1.800	2.3	4.500	3.5	8.500	4.8
0.500	1.5	2.000	2.4	5.000	3.7	9.000	4.9
0.600	1.4	2.200	2.5	5.500	3.9	9.500	5.0
0.800	1.6	2.400	2.6	6.000	4.1		
1.000	1.8	2.600	2.7	6.500	4.2		

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Storage Structures for COEDWAY.SWS

Tank or Pond Manhole: 10, DS/PN: 1.009

Invert Level (m) 70.308

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	30.0	1.000	30.0	1.001	0.0


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Summary of Results for 15 minute 100 year Winter (COEDWAY.SWS)

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

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m ³)	Flow / Overflow Cap. (l/s)	Pipe Flow (l/s)	Status
1.000	1	72.200	-0.100	0.000	0.00	0.0	OK
1.001	2	71.932	0.019	0.000	0.87	23.3	SURCHARGED
1.002	3	71.633	0.256	0.000	1.19	21.3	SURCHARGED
1.003	4	71.556	0.261	0.000	0.74	18.9	SURCHARGED
2.000	16	71.466	0.290	0.000	0.61	3.9	SURCHARGED
1.004	5	71.426	0.398	0.000	1.01	23.4	SURCHARGED
3.000	17	71.394	0.123	0.000	0.58	3.9	SURCHARGED
1.005	6	71.291	0.403	0.000	1.15	28.0	SURCHARGED
4.000	18	71.148	-0.038	0.000	0.66	4.2	OK
4.001	19	71.106	0.084	0.000	0.63	3.9	SURCHARGED
4.002	20	71.084	0.164	0.000	0.46	3.9	SURCHARGED
1.006	7	71.060	0.360	0.000	1.34	30.6	SURCHARGED
5.000	21	71.062	-0.040	0.000	0.65	4.2	OK
5.001	22	70.960	0.025	0.000	0.81	5.2	SURCHARGED
5.002	23	70.949	0.197	0.000	0.58	4.9	SURCHARGED
6.000	24	70.954	0.281	0.000	0.79	4.7	SURCHARGED
6.001	25	70.947	0.337	0.000	0.80	4.6	SURCHARGED
1.007	8	70.942	0.376	0.000	1.49	41.6	SURCHARGED
1.008	9	70.924	0.367	0.000	1.50	40.4	SURCHARGED
1.009	10	70.923	0.391	0.000	0.17	4.7	SURCHARGED
1.010	11	70.927	0.422	0.000	0.10	2.9	SURCHARGED
1.011	12	70.935	0.440	0.000	0.02	1.6	SURCHARGED
1.012	13	69.948	-0.206	0.000	0.02	1.6	OK
1.013	14	69.526	-0.194	0.000	0.05	1.6	OK

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STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for COEDWAY.SWS

Pipe Sizes COEDWAY Manhole Sizes COEDWAY

FSR Rainfall Model - England and Wales

Return Period (years)	100	PIMP (%)	100
M5-60 (mm)	18.000	Add Flow / Climate Change (%)	40
Ratio R	0.350	Minimum Backdrop Height (m)	0.200
Maximum Rainfall (mm/hr)	50	Maximum Backdrop Height (m)	0.000
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	1.200
Foul Sewage (l/s/ha)	0.000	Min Vel for Auto Design only (m/s)	0.75
Volumetric Runoff Coeff.	0.750	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Network Design Table for COEDWAY.SWS

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	15.494	0.387	40.0	0.000	5.00	0.0	0.600	o	100	Pipe/Conduit
1.001	21.440	0.536	40.0	0.043	0.00	0.0	0.600	o	150	Pipe/Conduit
1.002	3.291	0.082	40.1	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit
1.003	10.327	0.267	38.7	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit
2.000	11.861	0.148	80.1	0.008	5.00	0.0	0.600	o	100	Pipe/Conduit
1.004	5.587	0.140	39.9	0.004	0.00	0.0	0.600	o	150	Pipe/Conduit
3.000	29.942	0.383	78.2	0.008	5.00	0.0	0.600	o	100	Pipe/Conduit
1.005	7.519	0.188	40.0	0.003	0.00	0.0	0.600	o	150	Pipe/Conduit

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	E I.Area (ha)	E Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.000	50.00	5.21	72.200	0.000	0.0	0.0	0.0	1.22	9.6	0.0
1.001	50.00	5.44	71.763	0.043	0.0	0.0	2.3	1.60	28.2	8.2
1.002	50.00	5.47	71.227	0.043	0.0	0.0	2.3	1.59	28.2	8.2
1.003	50.00	5.58	71.145	0.043	0.0	0.0	2.3	1.62	28.7	8.2
2.000	50.00	5.23	71.076	0.008	0.0	0.0	0.4	0.86	6.8	1.5
1.004	50.00	5.63	70.878	0.055	0.0	0.0	3.0	1.60	28.2	10.4
3.000	50.00	5.57	71.171	0.008	0.0	0.0	0.4	0.87	6.8	1.5
1.005	50.00	5.71	70.738	0.066	0.0	0.0	3.6	1.60	28.2	12.5

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Network Design Table for COEDWAY.SWS

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
4.000	13.100	0.164	79.9	0.008	5.00	0.0	0.600	o	100	Pipe/Conduit
4.001	8.142	0.102	79.8	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit
4.002	9.375	0.220	42.6	0.001	0.00	0.0	0.600	o	100	Pipe/Conduit
1.006	5.333	0.134	39.8	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit
5.000	13.325	0.167	79.8	0.008	5.00	0.0	0.600	o	100	Pipe/Conduit
5.001	14.620	0.183	79.9	0.002	0.00	0.0	0.600	o	100	Pipe/Conduit
5.002	8.239	0.186	44.3	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit
6.000	5.050	0.063	80.2	0.009	5.00	0.0	0.600	o	100	Pipe/Conduit
6.001	3.422	0.044	77.8	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit
1.007	2.466	0.008	300.0	0.007	0.00	0.0	0.600	o	225	Pipe/Conduit
1.008	5.114	0.026	200.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit
1.009	5.523	0.028	200.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit
1.010	1.898	0.009	200.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit
1.011	5.119	0.341	15.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit
1.012	6.507	0.434	15.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit
1.013	2.525	0.063	40.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
4.000	50.00	5.25	71.086	0.008	0.0	0.0	0.4	0.86	6.8	1.5
4.001	50.00	5.41	70.922	0.008	0.0	0.0	0.4	0.86	6.8	1.5
4.002	50.00	5.54	70.820	0.009	0.0	0.0	0.5	1.18	9.3	1.7
1.006	50.00	5.77	70.550	0.075	0.0	0.0	4.1	1.60	28.3	14.2
5.000	50.00	5.26	71.002	0.008	0.0	0.0	0.4	0.86	6.8	1.5
5.001	50.00	5.54	70.835	0.010	0.0	0.0	0.5	0.86	6.8	1.9
5.002	50.00	5.66	70.652	0.010	0.0	0.0	0.5	1.16	9.1	1.9
6.000	50.00	5.10	70.573	0.009	0.0	0.0	0.5	0.86	6.8	1.7
6.001	50.00	5.16	70.510	0.009	0.0	0.0	0.5	0.87	6.9	1.7
1.007	50.00	5.82	70.341	0.101	0.0	0.0	5.5	0.75	29.8	19.1
1.008	50.00	5.92	70.333	0.101	0.0	0.0	5.5	0.92	36.6	19.1
1.009	50.00	6.02	70.307	0.101	0.0	0.0	5.5	0.92	36.6	19.1
1.010	50.00	6.05	70.280	0.101	0.0	0.0	5.5	0.92	36.6	19.1
1.011	50.00	6.07	70.270	0.101	0.0	0.0	5.5	3.39	135.0	19.1
1.012	50.00	6.11	69.929	0.101	0.0	0.0	5.5	3.40	135.1	19.1
1.013	50.00	6.13	69.495	0.101	0.0	0.0	5.5	2.07	82.5	19.1



Manhole Schedules for COEDWAY.SWS

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	Pipe Out		Pipes In			Backdrop (mm)
					PN	Invert Level (m)	Diameter (mm)	PN	Invert Level (m)	
1	73.100	0.900	Open Manhole	450	1.000	72.200	100			
2	72.900	1.137	Open Manhole	1200	1.001	71.763	150	1.000	71.813	100
3	72.600	1.373	Open Manhole	1200	1.002	71.227	150	1.001	71.227	150
4	72.450	1.305	Open Manhole	1200	1.003	71.145	150	1.002	71.145	150
16	72.250	1.174	Open Manhole	450	2.000	71.076	100			
5	72.100	1.222	Open Manhole	600	1.004	70.878	150	1.003	70.878	150
								2.000	70.928	100
17	72.000	0.829	Open Manhole	450	3.000	71.171	100			
6	72.100	1.362	Open Manhole	600	1.005	70.738	150	1.004	70.738	150
								3.000	70.788	100
18	72.200	1.114	Open Manhole	450	4.000	71.086	100			
19	72.100	1.178	Open Manhole	450	4.001	70.922	100	4.000	70.922	100
20	72.100	1.280	Open Manhole	450	4.002	70.820	100	4.001	70.820	100
7	72.000	1.450	Open Manhole	1200	1.006	70.550	150	1.005	70.550	150
								4.002	70.600	100
21	71.500	0.498	Open Manhole	450	5.000	71.002	100			
22	71.750	0.915	Open Manhole	450	5.001	70.835	100	5.000	70.835	100
23	72.000	1.348	Open Manhole	450	5.002	70.652	100	5.001	70.652	100
24	71.750	1.177	Open Manhole	450	6.000	70.573	100			
25	71.750	1.240	Open Manhole	450	6.001	70.510	100	6.000	70.510	100
8	71.850	1.509	Open Manhole	1200	1.007	70.341	225	1.006	70.416	150
								5.002	70.466	100
								6.001	70.466	100
9	71.850	1.517	Open Manhole	1200	1.008	70.333	225	1.007	70.333	225
10	71.750	1.443	Open Manhole	1200	1.009	70.307	225	1.008	70.307	225
11	71.750	1.470	Open Manhole	1200	1.010	70.280	225	1.009	70.280	225
12	71.750	1.480	Open Manhole	1200	1.011	70.270	225	1.010	70.270	225
13	70.500	0.571	Open Manhole	1200	1.012	69.929	225	1.011	69.929	225
14	70.000	0.505	Open Manhole	1200	1.013	69.495	225	1.012	69.495	225
15	69.900	0.468	Open Manhole	0		OUTFALL		1.013	69.432	225

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
1	-396962.638	-307552.133	-396962.638	-307552.133	Required	●

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LAND AT COEDWAY
POWYS



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Manhole Schedules for COEDWAY.SWS

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
2	-396963.225	-307536.650	-396963.225	-307536.650	Required	
3	-396981.444	-307525.349	-396981.444	-307525.349	Required	
4	-396980.217	-307522.295	-396980.217	-307522.295	Required	
16	-396968.062	-307513.801	-396968.062	-307513.801	Required	
5	-396979.782	-307511.977	-396979.782	-307511.977	Required	
17	-396949.629	-307505.159	-396949.629	-307505.159	Required	
6	-396979.546	-307506.394	-396979.546	-307506.394	Required	
18	-396997.622	-307513.320	-396997.622	-307513.320	Required	
19	-396999.759	-307500.395	-396999.759	-307500.395	Required	
20	-396991.727	-307499.066	-396991.727	-307499.066	Required	
7	-396982.358	-307499.421	-396982.358	-307499.421	Required	
21	-396950.786	-307484.694	-396950.786	-307484.694	Required	
22	-396962.124	-307491.695	-396962.124	-307491.695	Required	
23	-396975.464	-307497.678	-396975.464	-307497.678	Required	
24	-396981.404	-307485.968	-396981.404	-307485.968	Required	

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Manhole Schedules for COEDWAY.SWS

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
25	-396981.442	-307491.017	-396981.442	-307491.017	Required	
8	-396982.893	-307494.116	-396982.893	-307494.116	Required	
9	-396985.110	-307493.037	-396985.110	-307493.037	Required	
10	-396989.708	-307490.798	-396989.708	-307490.798	Required	
11	-396989.899	-307485.279	-396989.899	-307485.279	Required	
12	-396989.964	-307483.382	-396989.964	-307483.382	Required	
13	-396990.141	-307478.266	-396990.141	-307478.266	Required	
14	-396991.375	-307471.877	-396991.375	-307471.877	Required	
15	-396992.275	-307469.517			No Entry	

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PIPELINE SCHEDULES for COEDWAY.SWS

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	100	1	73.100	72.200	0.800	Open Manhole	450
1.001	o	150	2	72.900	71.763	0.987	Open Manhole	1200
1.002	o	150	3	72.600	71.227	1.223	Open Manhole	1200
1.003	o	150	4	72.450	71.145	1.155	Open Manhole	1200
2.000	o	100	16	72.250	71.076	1.074	Open Manhole	450
1.004	o	150	5	72.100	70.878	1.072	Open Manhole	600
3.000	o	100	17	72.000	71.171	0.729	Open Manhole	450
1.005	o	150	6	72.100	70.738	1.212	Open Manhole	600
4.000	o	100	18	72.200	71.086	1.014	Open Manhole	450
4.001	o	100	19	72.100	70.922	1.078	Open Manhole	450
4.002	o	100	20	72.100	70.820	1.180	Open Manhole	450
1.006	o	150	7	72.000	70.550	1.300	Open Manhole	1200
5.000	o	100	21	71.500	71.002	0.398	Open Manhole	450
5.001	o	100	22	71.750	70.835	0.815	Open Manhole	450

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	15.494	40.0	2	72.900	71.813	0.987	Open Manhole	1200
1.001	21.440	40.0	3	72.600	71.227	1.223	Open Manhole	1200
1.002	3.291	40.1	4	72.450	71.145	1.155	Open Manhole	1200
1.003	10.327	38.7	5	72.100	70.878	1.072	Open Manhole	600
2.000	11.861	80.1	5	72.100	70.928	1.072	Open Manhole	600
1.004	5.587	39.9	6	72.100	70.738	1.212	Open Manhole	600
3.000	29.942	78.2	6	72.100	70.788	1.212	Open Manhole	600
1.005	7.519	40.0	7	72.000	70.550	1.300	Open Manhole	1200
4.000	13.100	79.9	19	72.100	70.922	1.078	Open Manhole	450
4.001	8.142	79.8	20	72.100	70.820	1.180	Open Manhole	450
4.002	9.375	42.6	7	72.000	70.600	1.300	Open Manhole	1200
1.006	5.333	39.8	8	71.850	70.416	1.284	Open Manhole	1200
5.000	13.325	79.8	22	71.750	70.835	0.815	Open Manhole	450
5.001	14.620	79.9	23	72.000	70.652	1.248	Open Manhole	450

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PIPELINE SCHEDULES for COEDWAY.SWS

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)
5.002	o	100	23	72.000	70.652	1.248	Open Manhole	450
6.000	o	100	24	71.750	70.573	1.077	Open Manhole	450
6.001	o	100	25	71.750	70.510	1.140	Open Manhole	450
1.007	o	225	8	71.850	70.341	1.284	Open Manhole	1200
1.008	o	225	9	71.850	70.333	1.292	Open Manhole	1200
1.009	o	225	10	71.750	70.307	1.218	Open Manhole	1200
1.010	o	225	11	71.750	70.280	1.245	Open Manhole	1200
1.011	o	225	12	71.750	70.270	1.255	Open Manhole	1200
1.012	o	225	13	70.500	69.929	0.346	Open Manhole	1200
1.013	o	225	14	70.000	69.495	0.280	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)
5.002	8.239	44.3	8	71.850	70.466	1.284	Open Manhole	1200
6.000	5.050	80.2	25	71.750	70.510	1.140	Open Manhole	450
6.001	3.422	77.8	8	71.850	70.466	1.284	Open Manhole	1200
1.007	2.466	300.0	9	71.850	70.333	1.292	Open Manhole	1200
1.008	5.114	200.0	10	71.750	70.307	1.218	Open Manhole	1200
1.009	5.523	200.0	11	71.750	70.280	1.245	Open Manhole	1200
1.010	1.898	200.0	12	71.750	70.270	1.255	Open Manhole	1200
1.011	5.119	15.0	13	70.500	69.929	0.346	Open Manhole	1200
1.012	6.507	15.0	14	70.000	69.495	0.280	Open Manhole	1200
1.013	2.525	40.0	15	69.900	69.432	0.243	Open Manhole	0

Free Flowing Outfall Details for COEDWAY.SWS

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D, L (mm)	W (mm)
1.013	15	69.900	69.432	0.000	0	0


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Simulation Criteria for COEDWAY.SWS

Volumetric Runoff Coeff	0.840	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	40.000
Hot Start (mins)	0	MADD Factor * 10m ³ /ha Storage	0.000
Hot Start Level (mm)	0	Run Time (mins)	480
Manhole Headloss Coeff (Global)	0.500	Output Interval (mins)	4
Number of Input Hydrographs		0 Number of Storage Structures	
Number of Online Controls		1 Number of Time/Area Diagrams	
Number of Offline Controls		0	

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Winter
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	18.000	Storm Duration (mins)	240
Ratio R	0.350		

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Online Controls for COEDWAY.SWS


Hydro-Brake® Optimum Manhole: 12, DS/PN: 1.011, Volume (m³): 1.7

Unit Reference	MD-SHE-0063-2000-1300-2000
Design Head (m)	1.300
Design Flow (l/s)	2.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	63
Invert Level (m)	70.270
Minimum Outlet Pipe Diameter (mm)	100
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.300	2.0
Flush-Flo™	0.280	1.7
Kick-Flo®	0.564	1.4
Mean Flow over Head Range	-	1.6

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)
0.100	1.4	1.200	1.9	3.000	2.9	7.000	4.4
0.200	1.7	1.400	2.1	3.500	3.2	7.500	4.5
0.300	1.7	1.600	2.2	4.000	3.4	8.000	4.6
0.400	1.6	1.800	2.3	4.500	3.5	8.500	4.8
0.500	1.5	2.000	2.4	5.000	3.7	9.000	4.9
0.600	1.4	2.200	2.5	5.500	3.9	9.500	5.0
0.800	1.6	2.400	2.6	6.000	4.1		
1.000	1.8	2.600	2.7	6.500	4.2		


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Storage Structures for COEDWAY.SWS

Tank or Pond Manhole: 10, DS/PN: 1.009

Invert Level (m) 70.308


Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	30.0	1.000	30.0	1.001	0.0

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Summary of Results for 240 minute 100 year Winter (COEDWAY.SWS)

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

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m ³)	Flow / Overflow Cap. (l/s)	Pipe Flow (l/s)	Status
1.000	1	72.200	-0.100	0.000	0.00	0.0	OK
1.001	2	71.806	-0.107	0.000	0.18	4.8	OK
1.002	3	71.545	0.168	0.000	0.27	4.8	SURCHARGED
1.003	4	71.543	0.248	0.000	0.19	4.8	SURCHARGED
2.000	16	71.541	0.365	0.000	0.14	0.9	SURCHARGED
1.004	5	71.539	0.511	0.000	0.26	6.1	SURCHARGED
3.000	17	71.539	0.268	0.000	0.13	0.9	SURCHARGED
1.005	6	71.536	0.648	0.000	0.29	7.0	SURCHARGED
4.000	18	71.536	0.350	0.000	0.14	0.9	SURCHARGED
4.001	19	71.534	0.512	0.000	0.14	0.9	SURCHARGED
4.002	20	71.533	0.613	0.000	0.11	0.9	SURCHARGED
1.006	7	71.531	0.831	0.000	0.33	7.6	SURCHARGED
5.000	21	71.498	0.396	0.000	0.24	1.5	FLOOD RISK
5.001	22	71.508	0.573	0.000	0.24	1.5	FLOOD RISK
5.002	23	71.518	0.766	0.000	0.18	1.5	SURCHARGED
6.000	24	71.529	0.856	0.000	0.16	1.0	FLOOD RISK
6.001	25	71.528	0.918	0.000	0.16	0.9	FLOOD RISK
1.007	8	71.527	0.961	0.000	0.35	9.9	SURCHARGED
1.008	9	71.526	0.968	0.000	0.36	9.6	SURCHARGED
1.009	10	71.524	0.992	0.000	0.09	2.4	FLOOD RISK
1.010	11	71.523	1.018	0.000	0.07	2.1	FLOOD RISK
1.011	12	71.522	1.027	0.000	0.02	2.0	FLOOD RISK
1.012	13	69.952	-0.202	0.000	0.02	2.0	OK
1.013	14	69.529	-0.191	0.000	0.06	2.0	OK

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STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for COEDWAY.SWS

Pipe Sizes COEDWAY Manhole Sizes COEDWAY

FSR Rainfall Model - England and Wales

Return Period (years)	100	PIMP (%)	100
M5-60 (mm)	18.000	Add Flow / Climate Change (%)	40
Ratio R	0.350	Minimum Backdrop Height (m)	0.200
Maximum Rainfall (mm/hr)	50	Maximum Backdrop Height (m)	0.000
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	1.200
Foul Sewage (l/s/ha)	0.000	Min Vel for Auto Design only (m/s)	0.75
Volumetric Runoff Coeff.	0.750	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Network Design Table for COEDWAY.SWS

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	15.494	0.387	40.0	0.000	5.00	0.0	0.600	o	100	Pipe/Conduit
1.001	21.440	0.536	40.0	0.043	0.00	0.0	0.600	o	150	Pipe/Conduit
1.002	3.291	0.082	40.1	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit
1.003	10.327	0.267	38.7	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit
2.000	11.861	0.148	80.1	0.008	5.00	0.0	0.600	o	100	Pipe/Conduit
1.004	5.587	0.140	39.9	0.004	0.00	0.0	0.600	o	150	Pipe/Conduit
3.000	29.942	0.383	78.2	0.008	5.00	0.0	0.600	o	100	Pipe/Conduit
1.005	7.519	0.188	40.0	0.003	0.00	0.0	0.600	o	150	Pipe/Conduit

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	E I.Area (ha)	E Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.000	50.00	5.21	72.200	0.000	0.0	0.0	0.0	1.22	9.6	0.0
1.001	50.00	5.44	71.763	0.043	0.0	0.0	2.3	1.60	28.2	8.2
1.002	50.00	5.47	71.227	0.043	0.0	0.0	2.3	1.59	28.2	8.2
1.003	50.00	5.58	71.145	0.043	0.0	0.0	2.3	1.62	28.7	8.2
2.000	50.00	5.23	71.076	0.008	0.0	0.0	0.4	0.86	6.8	1.5
1.004	50.00	5.63	70.878	0.055	0.0	0.0	3.0	1.60	28.2	10.4
3.000	50.00	5.57	71.171	0.008	0.0	0.0	0.4	0.87	6.8	1.5
1.005	50.00	5.71	70.738	0.066	0.0	0.0	3.6	1.60	28.2	12.5

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Network Design Table for COEDWAY.SWS

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
4.000	13.100	0.164	79.9	0.008	5.00	0.0	0.600	o	100	Pipe/Conduit
4.001	8.142	0.102	79.8	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit
4.002	9.375	0.220	42.6	0.001	0.00	0.0	0.600	o	100	Pipe/Conduit
1.006	5.333	0.134	39.8	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit
5.000	13.325	0.167	79.8	0.008	5.00	0.0	0.600	o	100	Pipe/Conduit
5.001	14.620	0.183	79.9	0.002	0.00	0.0	0.600	o	100	Pipe/Conduit
5.002	8.239	0.186	44.3	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit
6.000	5.050	0.063	80.2	0.009	5.00	0.0	0.600	o	100	Pipe/Conduit
6.001	3.422	0.044	77.8	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit
1.007	2.466	0.008	300.0	0.007	0.00	0.0	0.600	o	225	Pipe/Conduit
1.008	5.114	0.026	200.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit
1.009	5.523	0.028	200.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit
1.010	1.898	0.009	200.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit
1.011	5.119	0.341	15.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit
1.012	6.507	0.434	15.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit
1.013	2.525	0.063	40.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
4.000	50.00	5.25	71.086	0.008	0.0	0.0	0.4	0.86	6.8	1.5
4.001	50.00	5.41	70.922	0.008	0.0	0.0	0.4	0.86	6.8	1.5
4.002	50.00	5.54	70.820	0.009	0.0	0.0	0.5	1.18	9.3	1.7
1.006	50.00	5.77	70.550	0.075	0.0	0.0	4.1	1.60	28.3	14.2
5.000	50.00	5.26	71.002	0.008	0.0	0.0	0.4	0.86	6.8	1.5
5.001	50.00	5.54	70.835	0.010	0.0	0.0	0.5	0.86	6.8	1.9
5.002	50.00	5.66	70.652	0.010	0.0	0.0	0.5	1.16	9.1	1.9
6.000	50.00	5.10	70.573	0.009	0.0	0.0	0.5	0.86	6.8	1.7
6.001	50.00	5.16	70.510	0.009	0.0	0.0	0.5	0.87	6.9	1.7
1.007	50.00	5.82	70.341	0.101	0.0	0.0	5.5	0.75	29.8	19.1
1.008	50.00	5.92	70.333	0.101	0.0	0.0	5.5	0.92	36.6	19.1
1.009	50.00	6.02	70.307	0.101	0.0	0.0	5.5	0.92	36.6	19.1
1.010	50.00	6.05	70.280	0.101	0.0	0.0	5.5	0.92	36.6	19.1
1.011	50.00	6.07	70.270	0.101	0.0	0.0	5.5	3.39	135.0	19.1
1.012	50.00	6.11	69.929	0.101	0.0	0.0	5.5	3.40	135.1	19.1
1.013	50.00	6.13	69.495	0.101	0.0	0.0	5.5	2.07	82.5	19.1



Manhole Schedules for COEDWAY.SWS

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
1	73.100	0.900	Open Manhole	450	1.000	72.200	100				
2	72.900	1.137	Open Manhole	1200	1.001	71.763	150	1.000	71.813	100	
3	72.600	1.373	Open Manhole	1200	1.002	71.227	150	1.001	71.227	150	
4	72.450	1.305	Open Manhole	1200	1.003	71.145	150	1.002	71.145	150	
16	72.250	1.174	Open Manhole	450	2.000	71.076	100				
5	72.100	1.222	Open Manhole	600	1.004	70.878	150	1.003	70.878	150	
								2.000	70.928	100	
17	72.000	0.829	Open Manhole	450	3.000	71.171	100				
6	72.100	1.362	Open Manhole	600	1.005	70.738	150	1.004	70.738	150	
								3.000	70.788	100	
18	72.200	1.114	Open Manhole	450	4.000	71.086	100				
19	72.100	1.178	Open Manhole	450	4.001	70.922	100	4.000	70.922	100	
20	72.100	1.280	Open Manhole	450	4.002	70.820	100	4.001	70.820	100	
7	72.000	1.450	Open Manhole	1200	1.006	70.550	150	1.005	70.550	150	
								4.002	70.600	100	
21	71.500	0.498	Open Manhole	450	5.000	71.002	100				
22	71.750	0.915	Open Manhole	450	5.001	70.835	100	5.000	70.835	100	
23	72.000	1.348	Open Manhole	450	5.002	70.652	100	5.001	70.652	100	
24	71.750	1.177	Open Manhole	450	6.000	70.573	100				
25	71.750	1.240	Open Manhole	450	6.001	70.510	100	6.000	70.510	100	
8	71.850	1.509	Open Manhole	1200	1.007	70.341	225	1.006	70.416	150	
								5.002	70.466	100	
								6.001	70.466	100	
9	71.850	1.517	Open Manhole	1200	1.008	70.333	225	1.007	70.333	225	
10	71.750	1.443	Open Manhole	1200	1.009	70.307	225	1.008	70.307	225	
11	71.750	1.470	Open Manhole	1200	1.010	70.280	225	1.009	70.280	225	
12	71.750	1.480	Open Manhole	1200	1.011	70.270	225	1.010	70.270	225	
13	70.500	0.571	Open Manhole	1200	1.012	69.929	225	1.011	69.929	225	
14	70.000	0.505	Open Manhole	1200	1.013	69.495	225	1.012	69.495	225	
15	69.900	0.468	Open Manhole	0		OUTFALL		1.013	69.432	225	

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
1	-396962.638	-307552.133	-396962.638	-307552.133	Required	●

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LAND AT COEDWAY
POWYS



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File Coedway.MDX

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Manhole Schedules for COEDWAY.SWS

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
2	-396963.225	-307536.650	-396963.225	-307536.650	Required	
3	-396981.444	-307525.349	-396981.444	-307525.349	Required	
4	-396980.217	-307522.295	-396980.217	-307522.295	Required	
16	-396968.062	-307513.801	-396968.062	-307513.801	Required	
5	-396979.782	-307511.977	-396979.782	-307511.977	Required	
17	-396949.629	-307505.159	-396949.629	-307505.159	Required	
6	-396979.546	-307506.394	-396979.546	-307506.394	Required	
18	-396997.622	-307513.320	-396997.622	-307513.320	Required	
19	-396999.759	-307500.395	-396999.759	-307500.395	Required	
20	-396991.727	-307499.066	-396991.727	-307499.066	Required	
7	-396982.358	-307499.421	-396982.358	-307499.421	Required	
21	-396950.786	-307484.694	-396950.786	-307484.694	Required	
22	-396962.124	-307491.695	-396962.124	-307491.695	Required	
23	-396975.464	-307497.678	-396975.464	-307497.678	Required	
24	-396981.404	-307485.968	-396981.404	-307485.968	Required	

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Manhole Schedules for COEDWAY.SWS

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
25	-396981.442	-307491.017	-396981.442	-307491.017	Required	
8	-396982.893	-307494.116	-396982.893	-307494.116	Required	
9	-396985.110	-307493.037	-396985.110	-307493.037	Required	
10	-396989.708	-307490.798	-396989.708	-307490.798	Required	
11	-396989.899	-307485.279	-396989.899	-307485.279	Required	
12	-396989.964	-307483.382	-396989.964	-307483.382	Required	
13	-396990.141	-307478.266	-396990.141	-307478.266	Required	
14	-396991.375	-307471.877	-396991.375	-307471.877	Required	
15	-396992.275	-307469.517			No Entry	

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PIPELINE SCHEDULES for COEDWAY.SWS

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	100	1	73.100	72.200	0.800	Open Manhole	450
1.001	o	150	2	72.900	71.763	0.987	Open Manhole	1200
1.002	o	150	3	72.600	71.227	1.223	Open Manhole	1200
1.003	o	150	4	72.450	71.145	1.155	Open Manhole	1200
2.000	o	100	16	72.250	71.076	1.074	Open Manhole	450
1.004	o	150	5	72.100	70.878	1.072	Open Manhole	600
3.000	o	100	17	72.000	71.171	0.729	Open Manhole	450
1.005	o	150	6	72.100	70.738	1.212	Open Manhole	600
4.000	o	100	18	72.200	71.086	1.014	Open Manhole	450
4.001	o	100	19	72.100	70.922	1.078	Open Manhole	450
4.002	o	100	20	72.100	70.820	1.180	Open Manhole	450
1.006	o	150	7	72.000	70.550	1.300	Open Manhole	1200
5.000	o	100	21	71.500	71.002	0.398	Open Manhole	450
5.001	o	100	22	71.750	70.835	0.815	Open Manhole	450

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	15.494	40.0	2	72.900	71.813	0.987	Open Manhole	1200
1.001	21.440	40.0	3	72.600	71.227	1.223	Open Manhole	1200
1.002	3.291	40.1	4	72.450	71.145	1.155	Open Manhole	1200
1.003	10.327	38.7	5	72.100	70.878	1.072	Open Manhole	600
2.000	11.861	80.1	5	72.100	70.928	1.072	Open Manhole	600
1.004	5.587	39.9	6	72.100	70.738	1.212	Open Manhole	600
3.000	29.942	78.2	6	72.100	70.788	1.212	Open Manhole	600
1.005	7.519	40.0	7	72.000	70.550	1.300	Open Manhole	1200
4.000	13.100	79.9	19	72.100	70.922	1.078	Open Manhole	450
4.001	8.142	79.8	20	72.100	70.820	1.180	Open Manhole	450
4.002	9.375	42.6	7	72.000	70.600	1.300	Open Manhole	1200
1.006	5.333	39.8	8	71.850	70.416	1.284	Open Manhole	1200
5.000	13.325	79.8	22	71.750	70.835	0.815	Open Manhole	450
5.001	14.620	79.9	23	72.000	70.652	1.248	Open Manhole	450

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PIPELINE SCHEDULES for COEDWAY.SWS

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)
5.002	o	100	23	72.000	70.652	1.248	Open Manhole	450
6.000	o	100	24	71.750	70.573	1.077	Open Manhole	450
6.001	o	100	25	71.750	70.510	1.140	Open Manhole	450
1.007	o	225	8	71.850	70.341	1.284	Open Manhole	1200
1.008	o	225	9	71.850	70.333	1.292	Open Manhole	1200
1.009	o	225	10	71.750	70.307	1.218	Open Manhole	1200
1.010	o	225	11	71.750	70.280	1.245	Open Manhole	1200
1.011	o	225	12	71.750	70.270	1.255	Open Manhole	1200
1.012	o	225	13	70.500	69.929	0.346	Open Manhole	1200
1.013	o	225	14	70.000	69.495	0.280	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)
5.002	8.239	44.3	8	71.850	70.466	1.284	Open Manhole	1200
6.000	5.050	80.2	25	71.750	70.510	1.140	Open Manhole	450
6.001	3.422	77.8	8	71.850	70.466	1.284	Open Manhole	1200
1.007	2.466	300.0	9	71.850	70.333	1.292	Open Manhole	1200
1.008	5.114	200.0	10	71.750	70.307	1.218	Open Manhole	1200
1.009	5.523	200.0	11	71.750	70.280	1.245	Open Manhole	1200
1.010	1.898	200.0	12	71.750	70.270	1.255	Open Manhole	1200
1.011	5.119	15.0	13	70.500	69.929	0.346	Open Manhole	1200
1.012	6.507	15.0	14	70.000	69.495	0.280	Open Manhole	1200
1.013	2.525	40.0	15	69.900	69.432	0.243	Open Manhole	0

Free Flowing Outfall Details for COEDWAY.SWS

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D, L (mm)	W (mm)
1.013	15	69.900	69.432	0.000	0	0


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Simulation Criteria for COEDWAY.SWS

Volumetric Runoff Coeff	0.840	Foul Sewage per hectare (l/s)	0.000	
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	40.000	
Hot Start (mins)	0	MADD Factor * 10m ³ /ha Storage	0.000	
Hot Start Level (mm)	0	Run Time (mins)	60	
Manhole Headloss Coeff (Global)	0.500	Output Interval (mins)	1	
Number of Input Hydrographs		0	Number of Storage Structures	1
Number of Online Controls		1	Number of Time/Area Diagrams	0
Number of Offline Controls		0		

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Winter
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	18.000	Storm Duration (mins)	30
Ratio R	0.350		

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Online Controls for COEDWAY.SWS


Hydro-Brake® Optimum Manhole: 12, DS/PN: 1.011, Volume (m³): 1.7

Unit Reference	MD-SHE-0063-2000-1300-2000
Design Head (m)	1.300
Design Flow (l/s)	2.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	63
Invert Level (m)	70.270
Minimum Outlet Pipe Diameter (mm)	100
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.300	2.0
Flush-Flo™	0.280	1.7
Kick-Flo®	0.564	1.4
Mean Flow over Head Range	-	1.6

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)
0.100	1.4	1.200	1.9	3.000	2.9	7.000	4.4
0.200	1.7	1.400	2.1	3.500	3.2	7.500	4.5
0.300	1.7	1.600	2.2	4.000	3.4	8.000	4.6
0.400	1.6	1.800	2.3	4.500	3.5	8.500	4.8
0.500	1.5	2.000	2.4	5.000	3.7	9.000	4.9
0.600	1.4	2.200	2.5	5.500	3.9	9.500	5.0
0.800	1.6	2.400	2.6	6.000	4.1		
1.000	1.8	2.600	2.7	6.500	4.2		


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Storage Structures for COEDWAY.SWS

Tank or Pond Manhole: 10, DS/PN: 1.009

Invert Level (m) 70.308


Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	30.0	1.000	30.0	1.001	0.0

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Summary of Results for 30 minute 100 year Winter (COEDWAY.SWS)

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

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m ³)	Flow / Overflow Cap. (l/s)	Pipe Flow (l/s)	Status
1.000	1	72.200	-0.100	0.000	0.00	0.0	OK
1.001	2	71.856	-0.057	0.000	0.70	18.7	OK
1.002	3	71.471	0.094	0.000	1.00	17.9	SURCHARGED
1.003	4	71.414	0.119	0.000	0.67	17.0	SURCHARGED
2.000	16	71.362	0.186	0.000	0.50	3.2	SURCHARGED
1.004	5	71.331	0.303	0.000	0.86	20.1	SURCHARGED
3.000	17	71.307	0.036	0.000	0.50	3.3	SURCHARGED
1.005	6	71.245	0.357	0.000	0.98	23.8	SURCHARGED
4.000	18	71.173	-0.013	0.000	0.53	3.4	OK
4.001	19	71.155	0.133	0.000	0.53	3.3	SURCHARGED
4.002	20	71.141	0.221	0.000	0.39	3.3	SURCHARGED
1.006	7	71.127	0.427	0.000	1.13	25.8	SURCHARGED
5.000	21	71.109	0.007	0.000	0.53	3.4	SURCHARGED
5.001	22	71.107	0.172	0.000	0.65	4.2	SURCHARGED
5.002	23	71.105	0.353	0.000	0.43	3.6	SURCHARGED
6.000	24	71.106	0.433	0.000	0.62	3.6	SURCHARGED
6.001	25	71.105	0.495	0.000	0.62	3.5	SURCHARGED
1.007	8	71.104	0.538	0.000	1.24	34.5	SURCHARGED
1.008	9	71.103	0.545	0.000	1.25	33.4	SURCHARGED
1.009	10	71.102	0.570	0.000	0.15	4.0	SURCHARGED
1.010	11	71.103	0.598	0.000	0.10	2.8	SURCHARGED
1.011	12	71.112	0.616	0.000	0.02	1.6	SURCHARGED
1.012	13	69.948	-0.206	0.000	0.02	1.6	OK
1.013	14	69.526	-0.194	0.000	0.05	1.6	OK

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STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for COEDWAY.SWS

Pipe Sizes COEDWAY Manhole Sizes COEDWAY

FSR Rainfall Model - England and Wales

Return Period (years)	100	PIMP (%)	100
M5-60 (mm)	18.000	Add Flow / Climate Change (%)	40
Ratio R	0.350	Minimum Backdrop Height (m)	0.200
Maximum Rainfall (mm/hr)	50	Maximum Backdrop Height (m)	0.000
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	1.200
Foul Sewage (l/s/ha)	0.000	Min Vel for Auto Design only (m/s)	0.75
Volumetric Runoff Coeff.	0.750	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Network Design Table for COEDWAY.SWS

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	15.494	0.387	40.0	0.000	5.00	0.0	0.600	o	100	Pipe/Conduit
1.001	21.440	0.536	40.0	0.043	0.00	0.0	0.600	o	150	Pipe/Conduit
1.002	3.291	0.082	40.1	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit
1.003	10.327	0.267	38.7	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit
2.000	11.861	0.148	80.1	0.008	5.00	0.0	0.600	o	100	Pipe/Conduit
1.004	5.587	0.140	39.9	0.004	0.00	0.0	0.600	o	150	Pipe/Conduit
3.000	29.942	0.383	78.2	0.008	5.00	0.0	0.600	o	100	Pipe/Conduit
1.005	7.519	0.188	40.0	0.003	0.00	0.0	0.600	o	150	Pipe/Conduit

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	E I.Area (ha)	E Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.000	50.00	5.21	72.200	0.000	0.0	0.0	0.0	1.22	9.6	0.0
1.001	50.00	5.44	71.763	0.043	0.0	0.0	2.3	1.60	28.2	8.2
1.002	50.00	5.47	71.227	0.043	0.0	0.0	2.3	1.59	28.2	8.2
1.003	50.00	5.58	71.145	0.043	0.0	0.0	2.3	1.62	28.7	8.2
2.000	50.00	5.23	71.076	0.008	0.0	0.0	0.4	0.86	6.8	1.5
1.004	50.00	5.63	70.878	0.055	0.0	0.0	3.0	1.60	28.2	10.4
3.000	50.00	5.57	71.171	0.008	0.0	0.0	0.4	0.87	6.8	1.5
1.005	50.00	5.71	70.738	0.066	0.0	0.0	3.6	1.60	28.2	12.5

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Network Design Table for COEDWAY.SWS

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
4.000	13.100	0.164	79.9	0.008	5.00	0.0	0.600	o	100	Pipe/Conduit
4.001	8.142	0.102	79.8	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit
4.002	9.375	0.220	42.6	0.001	0.00	0.0	0.600	o	100	Pipe/Conduit
1.006	5.333	0.134	39.8	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit
5.000	13.325	0.167	79.8	0.008	5.00	0.0	0.600	o	100	Pipe/Conduit
5.001	14.620	0.183	79.9	0.002	0.00	0.0	0.600	o	100	Pipe/Conduit
5.002	8.239	0.186	44.3	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit
6.000	5.050	0.063	80.2	0.009	5.00	0.0	0.600	o	100	Pipe/Conduit
6.001	3.422	0.044	77.8	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit
1.007	2.466	0.008	300.0	0.007	0.00	0.0	0.600	o	225	Pipe/Conduit
1.008	5.114	0.026	200.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit
1.009	5.523	0.028	200.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit
1.010	1.898	0.009	200.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit
1.011	5.119	0.341	15.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit
1.012	6.507	0.434	15.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit
1.013	2.525	0.063	40.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
4.000	50.00	5.25	71.086	0.008	0.0	0.0	0.4	0.86	6.8	1.5
4.001	50.00	5.41	70.922	0.008	0.0	0.0	0.4	0.86	6.8	1.5
4.002	50.00	5.54	70.820	0.009	0.0	0.0	0.5	1.18	9.3	1.7
1.006	50.00	5.77	70.550	0.075	0.0	0.0	4.1	1.60	28.3	14.2
5.000	50.00	5.26	71.002	0.008	0.0	0.0	0.4	0.86	6.8	1.5
5.001	50.00	5.54	70.835	0.010	0.0	0.0	0.5	0.86	6.8	1.9
5.002	50.00	5.66	70.652	0.010	0.0	0.0	0.5	1.16	9.1	1.9
6.000	50.00	5.10	70.573	0.009	0.0	0.0	0.5	0.86	6.8	1.7
6.001	50.00	5.16	70.510	0.009	0.0	0.0	0.5	0.87	6.9	1.7
1.007	50.00	5.82	70.341	0.101	0.0	0.0	5.5	0.75	29.8	19.1
1.008	50.00	5.92	70.333	0.101	0.0	0.0	5.5	0.92	36.6	19.1
1.009	50.00	6.02	70.307	0.101	0.0	0.0	5.5	0.92	36.6	19.1
1.010	50.00	6.05	70.280	0.101	0.0	0.0	5.5	0.92	36.6	19.1
1.011	50.00	6.07	70.270	0.101	0.0	0.0	5.5	3.39	135.0	19.1
1.012	50.00	6.11	69.929	0.101	0.0	0.0	5.5	3.40	135.1	19.1
1.013	50.00	6.13	69.495	0.101	0.0	0.0	5.5	2.07	82.5	19.1



Manhole Schedules for COEDWAY.SWS

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	Pipe Out		Pipes In			Backdrop (mm)
					PN	Invert Level (m)	Diameter (mm)	PN	Invert Level (m)	
1	73.100	0.900	Open Manhole	450	1.000	72.200	100			
2	72.900	1.137	Open Manhole	1200	1.001	71.763	150	1.000	71.813	100
3	72.600	1.373	Open Manhole	1200	1.002	71.227	150	1.001	71.227	150
4	72.450	1.305	Open Manhole	1200	1.003	71.145	150	1.002	71.145	150
16	72.250	1.174	Open Manhole	450	2.000	71.076	100			
5	72.100	1.222	Open Manhole	600	1.004	70.878	150	1.003	70.878	150
								2.000	70.928	100
17	72.000	0.829	Open Manhole	450	3.000	71.171	100			
6	72.100	1.362	Open Manhole	600	1.005	70.738	150	1.004	70.738	150
								3.000	70.788	100
18	72.200	1.114	Open Manhole	450	4.000	71.086	100			
19	72.100	1.178	Open Manhole	450	4.001	70.922	100	4.000	70.922	100
20	72.100	1.280	Open Manhole	450	4.002	70.820	100	4.001	70.820	100
7	72.000	1.450	Open Manhole	1200	1.006	70.550	150	1.005	70.550	150
								4.002	70.600	100
21	71.500	0.498	Open Manhole	450	5.000	71.002	100			
22	71.750	0.915	Open Manhole	450	5.001	70.835	100	5.000	70.835	100
23	72.000	1.348	Open Manhole	450	5.002	70.652	100	5.001	70.652	100
24	71.750	1.177	Open Manhole	450	6.000	70.573	100			
25	71.750	1.240	Open Manhole	450	6.001	70.510	100	6.000	70.510	100
8	71.850	1.509	Open Manhole	1200	1.007	70.341	225	1.006	70.416	150
								5.002	70.466	100
								6.001	70.466	100
9	71.850	1.517	Open Manhole	1200	1.008	70.333	225	1.007	70.333	225
10	71.750	1.443	Open Manhole	1200	1.009	70.307	225	1.008	70.307	225
11	71.750	1.470	Open Manhole	1200	1.010	70.280	225	1.009	70.280	225
12	71.750	1.480	Open Manhole	1200	1.011	70.270	225	1.010	70.270	225
13	70.500	0.571	Open Manhole	1200	1.012	69.929	225	1.011	69.929	225
14	70.000	0.505	Open Manhole	1200	1.013	69.495	225	1.012	69.495	225
15	69.900	0.468	Open Manhole	0		OUTFALL		1.013	69.432	225

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
1	-396962.638	-307552.133	-396962.638	-307552.133	Required	●

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Manhole Schedules for COEDWAY.SWS

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
2	-396963.225	-307536.650	-396963.225	-307536.650	Required	
3	-396981.444	-307525.349	-396981.444	-307525.349	Required	
4	-396980.217	-307522.295	-396980.217	-307522.295	Required	
16	-396968.062	-307513.801	-396968.062	-307513.801	Required	
5	-396979.782	-307511.977	-396979.782	-307511.977	Required	
17	-396949.629	-307505.159	-396949.629	-307505.159	Required	
6	-396979.546	-307506.394	-396979.546	-307506.394	Required	
18	-396997.622	-307513.320	-396997.622	-307513.320	Required	
19	-396999.759	-307500.395	-396999.759	-307500.395	Required	
20	-396991.727	-307499.066	-396991.727	-307499.066	Required	
7	-396982.358	-307499.421	-396982.358	-307499.421	Required	
21	-396950.786	-307484.694	-396950.786	-307484.694	Required	
22	-396962.124	-307491.695	-396962.124	-307491.695	Required	
23	-396975.464	-307497.678	-396975.464	-307497.678	Required	
24	-396981.404	-307485.968	-396981.404	-307485.968	Required	

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Manhole Schedules for COEDWAY.SWS

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
25	-396981.442	-307491.017	-396981.442	-307491.017	Required	
8	-396982.893	-307494.116	-396982.893	-307494.116	Required	
9	-396985.110	-307493.037	-396985.110	-307493.037	Required	
10	-396989.708	-307490.798	-396989.708	-307490.798	Required	
11	-396989.899	-307485.279	-396989.899	-307485.279	Required	
12	-396989.964	-307483.382	-396989.964	-307483.382	Required	
13	-396990.141	-307478.266	-396990.141	-307478.266	Required	
14	-396991.375	-307471.877	-396991.375	-307471.877	Required	
15	-396992.275	-307469.517			No Entry	

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PIPELINE SCHEDULES for COEDWAY.SWS

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	100	1	73.100	72.200	0.800	Open Manhole	450
1.001	o	150	2	72.900	71.763	0.987	Open Manhole	1200
1.002	o	150	3	72.600	71.227	1.223	Open Manhole	1200
1.003	o	150	4	72.450	71.145	1.155	Open Manhole	1200
2.000	o	100	16	72.250	71.076	1.074	Open Manhole	450
1.004	o	150	5	72.100	70.878	1.072	Open Manhole	600
3.000	o	100	17	72.000	71.171	0.729	Open Manhole	450
1.005	o	150	6	72.100	70.738	1.212	Open Manhole	600
4.000	o	100	18	72.200	71.086	1.014	Open Manhole	450
4.001	o	100	19	72.100	70.922	1.078	Open Manhole	450
4.002	o	100	20	72.100	70.820	1.180	Open Manhole	450
1.006	o	150	7	72.000	70.550	1.300	Open Manhole	1200
5.000	o	100	21	71.500	71.002	0.398	Open Manhole	450
5.001	o	100	22	71.750	70.835	0.815	Open Manhole	450

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	15.494	40.0	2	72.900	71.813	0.987	Open Manhole	1200
1.001	21.440	40.0	3	72.600	71.227	1.223	Open Manhole	1200
1.002	3.291	40.1	4	72.450	71.145	1.155	Open Manhole	1200
1.003	10.327	38.7	5	72.100	70.878	1.072	Open Manhole	600
2.000	11.861	80.1	5	72.100	70.928	1.072	Open Manhole	600
1.004	5.587	39.9	6	72.100	70.738	1.212	Open Manhole	600
3.000	29.942	78.2	6	72.100	70.788	1.212	Open Manhole	600
1.005	7.519	40.0	7	72.000	70.550	1.300	Open Manhole	1200
4.000	13.100	79.9	19	72.100	70.922	1.078	Open Manhole	450
4.001	8.142	79.8	20	72.100	70.820	1.180	Open Manhole	450
4.002	9.375	42.6	7	72.000	70.600	1.300	Open Manhole	1200
1.006	5.333	39.8	8	71.850	70.416	1.284	Open Manhole	1200
5.000	13.325	79.8	22	71.750	70.835	0.815	Open Manhole	450
5.001	14.620	79.9	23	72.000	70.652	1.248	Open Manhole	450

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PIPELINE SCHEDULES for COEDWAY.SWS

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)
5.002	o	100	23	72.000	70.652	1.248	Open Manhole	450
6.000	o	100	24	71.750	70.573	1.077	Open Manhole	450
6.001	o	100	25	71.750	70.510	1.140	Open Manhole	450
1.007	o	225	8	71.850	70.341	1.284	Open Manhole	1200
1.008	o	225	9	71.850	70.333	1.292	Open Manhole	1200
1.009	o	225	10	71.750	70.307	1.218	Open Manhole	1200
1.010	o	225	11	71.750	70.280	1.245	Open Manhole	1200
1.011	o	225	12	71.750	70.270	1.255	Open Manhole	1200
1.012	o	225	13	70.500	69.929	0.346	Open Manhole	1200
1.013	o	225	14	70.000	69.495	0.280	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)
5.002	8.239	44.3	8	71.850	70.466	1.284	Open Manhole	1200
6.000	5.050	80.2	25	71.750	70.510	1.140	Open Manhole	450
6.001	3.422	77.8	8	71.850	70.466	1.284	Open Manhole	1200
1.007	2.466	300.0	9	71.850	70.333	1.292	Open Manhole	1200
1.008	5.114	200.0	10	71.750	70.307	1.218	Open Manhole	1200
1.009	5.523	200.0	11	71.750	70.280	1.245	Open Manhole	1200
1.010	1.898	200.0	12	71.750	70.270	1.255	Open Manhole	1200
1.011	5.119	15.0	13	70.500	69.929	0.346	Open Manhole	1200
1.012	6.507	15.0	14	70.000	69.495	0.280	Open Manhole	1200
1.013	2.525	40.0	15	69.900	69.432	0.243	Open Manhole	0

Free Flowing Outfall Details for COEDWAY.SWS

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D, L (mm)	W (mm)
1.013	15	69.900	69.432	0.000	0	0


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Simulation Criteria for COEDWAY.SWS

Volumetric Runoff Coeff	0.840	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	40.000
Hot Start (mins)	0	MADD Factor * 10m ³ /ha Storage	0.000
Hot Start Level (mm)	0	Run Time (mins)	720
Manhole Headloss Coeff (Global)	0.500	Output Interval (mins)	6
Number of Input Hydrographs		0 Number of Storage Structures	
Number of Online Controls		1 Number of Time/Area Diagrams	
Number of Offline Controls		0	

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Winter
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	18.000	Storm Duration (mins)	360
Ratio R	0.350		

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Online Controls for COEDWAY.SWS


Hydro-Brake® Optimum Manhole: 12, DS/PN: 1.011, Volume (m³): 1.7

Unit Reference	MD-SHE-0063-2000-1300-2000
Design Head (m)	1.300
Design Flow (l/s)	2.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	63
Invert Level (m)	70.270
Minimum Outlet Pipe Diameter (mm)	100
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.300	2.0
Flush-Flo™	0.280	1.7
Kick-Flo®	0.564	1.4
Mean Flow over Head Range	-	1.6

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)
0.100	1.4	1.200	1.9	3.000	2.9	7.000	4.4
0.200	1.7	1.400	2.1	3.500	3.2	7.500	4.5
0.300	1.7	1.600	2.2	4.000	3.4	8.000	4.6
0.400	1.6	1.800	2.3	4.500	3.5	8.500	4.8
0.500	1.5	2.000	2.4	5.000	3.7	9.000	4.9
0.600	1.4	2.200	2.5	5.500	3.9	9.500	5.0
0.800	1.6	2.400	2.6	6.000	4.1		
1.000	1.8	2.600	2.7	6.500	4.2		


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Storage Structures for COEDWAY.SWS

Tank or Pond Manhole: 10, DS/PN: 1.009

Invert Level (m) 70.308


Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	30.0	1.000	30.0	1.001	0.0

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Summary of Results for 360 minute 100 year Winter (COEDWAY.SWS)

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

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m ³)	Pipe Flow / Overflow Cap. (l/s)	Pipe Flow (l/s)	Status
1.000	1	72.200	-0.100	0.000	0.00	0.0	OK
1.001	2	71.799	-0.114	0.000	0.13	3.5	OK
1.002	3	71.472	0.095	0.000	0.20	3.5	SURCHARGED
1.003	4	71.471	0.176	0.000	0.14	3.5	SURCHARGED
2.000	16	71.469	0.293	0.000	0.10	0.7	SURCHARGED
1.004	5	71.468	0.440	0.000	0.19	4.5	SURCHARGED
3.000	17	71.468	0.197	0.000	0.10	0.7	SURCHARGED
1.005	6	71.466	0.578	0.000	0.21	5.2	SURCHARGED
4.000	18	71.466	0.280	0.000	0.10	0.7	SURCHARGED
4.001	19	71.464	0.442	0.000	0.11	0.7	SURCHARGED
4.002	20	71.463	0.543	0.000	0.08	0.7	SURCHARGED
1.006	7	71.462	0.762	0.000	0.24	5.6	SURCHARGED
5.000	21	71.464	0.362	0.000	0.10	0.7	FLOOD RISK
5.001	22	71.462	0.527	0.000	0.12	0.8	FLOOD RISK
5.002	23	71.460	0.708	0.000	0.08	0.7	SURCHARGED
6.000	24	71.461	0.788	0.000	0.12	0.7	FLOOD RISK
6.001	25	71.460	0.850	0.000	0.12	0.7	FLOOD RISK
1.007	8	71.459	0.893	0.000	0.26	7.3	SURCHARGED
1.008	9	71.458	0.900	0.000	0.27	7.1	SURCHARGED
1.009	10	71.457	0.924	0.000	0.08	2.3	FLOOD RISK
1.010	11	71.455	0.950	0.000	0.07	2.1	FLOOD RISK
1.011	12	71.454	0.959	0.000	0.02	1.9	FLOOD RISK
1.012	13	69.951	-0.203	0.000	0.02	1.9	OK
1.013	14	69.529	-0.191	0.000	0.05	1.9	OK

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STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for COEDWAY.SWS

Pipe Sizes COEDWAY Manhole Sizes COEDWAY

FSR Rainfall Model - England and Wales

Return Period (years)	100	PIMP (%)	100
M5-60 (mm)	18.000	Add Flow / Climate Change (%)	40
Ratio R	0.350	Minimum Backdrop Height (m)	0.200
Maximum Rainfall (mm/hr)	50	Maximum Backdrop Height (m)	0.000
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	1.200
Foul Sewage (l/s/ha)	0.000	Min Vel for Auto Design only (m/s)	0.75
Volumetric Runoff Coeff.	0.750	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Network Design Table for COEDWAY.SWS

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	15.494	0.387	40.0	0.000	5.00	0.0	0.600	o	100	Pipe/Conduit
1.001	21.440	0.536	40.0	0.043	0.00	0.0	0.600	o	150	Pipe/Conduit
1.002	3.291	0.082	40.1	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit
1.003	10.327	0.267	38.7	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit
2.000	11.861	0.148	80.1	0.008	5.00	0.0	0.600	o	100	Pipe/Conduit
1.004	5.587	0.140	39.9	0.004	0.00	0.0	0.600	o	150	Pipe/Conduit
3.000	29.942	0.383	78.2	0.008	5.00	0.0	0.600	o	100	Pipe/Conduit
1.005	7.519	0.188	40.0	0.003	0.00	0.0	0.600	o	150	Pipe/Conduit

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	E I.Area (ha)	E Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.000	50.00	5.21	72.200	0.000	0.0	0.0	0.0	1.22	9.6	0.0
1.001	50.00	5.44	71.763	0.043	0.0	0.0	2.3	1.60	28.2	8.2
1.002	50.00	5.47	71.227	0.043	0.0	0.0	2.3	1.59	28.2	8.2
1.003	50.00	5.58	71.145	0.043	0.0	0.0	2.3	1.62	28.7	8.2
2.000	50.00	5.23	71.076	0.008	0.0	0.0	0.4	0.86	6.8	1.5
1.004	50.00	5.63	70.878	0.055	0.0	0.0	3.0	1.60	28.2	10.4
3.000	50.00	5.57	71.171	0.008	0.0	0.0	0.4	0.87	6.8	1.5
1.005	50.00	5.71	70.738	0.066	0.0	0.0	3.6	1.60	28.2	12.5

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Network Design Table for COEDWAY.SWS

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
4.000	13.100	0.164	79.9	0.008	5.00	0.0	0.600	o	100	Pipe/Conduit
4.001	8.142	0.102	79.8	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit
4.002	9.375	0.220	42.6	0.001	0.00	0.0	0.600	o	100	Pipe/Conduit
1.006	5.333	0.134	39.8	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit
5.000	13.325	0.167	79.8	0.008	5.00	0.0	0.600	o	100	Pipe/Conduit
5.001	14.620	0.183	79.9	0.002	0.00	0.0	0.600	o	100	Pipe/Conduit
5.002	8.239	0.186	44.3	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit
6.000	5.050	0.063	80.2	0.009	5.00	0.0	0.600	o	100	Pipe/Conduit
6.001	3.422	0.044	77.8	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit
1.007	2.466	0.008	300.0	0.007	0.00	0.0	0.600	o	225	Pipe/Conduit
1.008	5.114	0.026	200.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit
1.009	5.523	0.028	200.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit
1.010	1.898	0.009	200.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit
1.011	5.119	0.341	15.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit
1.012	6.507	0.434	15.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit
1.013	2.525	0.063	40.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
4.000	50.00	5.25	71.086	0.008	0.0	0.0	0.4	0.86	6.8	1.5
4.001	50.00	5.41	70.922	0.008	0.0	0.0	0.4	0.86	6.8	1.5
4.002	50.00	5.54	70.820	0.009	0.0	0.0	0.5	1.18	9.3	1.7
1.006	50.00	5.77	70.550	0.075	0.0	0.0	4.1	1.60	28.3	14.2
5.000	50.00	5.26	71.002	0.008	0.0	0.0	0.4	0.86	6.8	1.5
5.001	50.00	5.54	70.835	0.010	0.0	0.0	0.5	0.86	6.8	1.9
5.002	50.00	5.66	70.652	0.010	0.0	0.0	0.5	1.16	9.1	1.9
6.000	50.00	5.10	70.573	0.009	0.0	0.0	0.5	0.86	6.8	1.7
6.001	50.00	5.16	70.510	0.009	0.0	0.0	0.5	0.87	6.9	1.7
1.007	50.00	5.82	70.341	0.101	0.0	0.0	5.5	0.75	29.8	19.1
1.008	50.00	5.92	70.333	0.101	0.0	0.0	5.5	0.92	36.6	19.1
1.009	50.00	6.02	70.307	0.101	0.0	0.0	5.5	0.92	36.6	19.1
1.010	50.00	6.05	70.280	0.101	0.0	0.0	5.5	0.92	36.6	19.1
1.011	50.00	6.07	70.270	0.101	0.0	0.0	5.5	3.39	135.0	19.1
1.012	50.00	6.11	69.929	0.101	0.0	0.0	5.5	3.40	135.1	19.1
1.013	50.00	6.13	69.495	0.101	0.0	0.0	5.5	2.07	82.5	19.1



Manhole Schedules for COEDWAY.SWS

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	Pipe Out		Pipes In			Backdrop (mm)
					PN	Invert Level (m)	Diameter (mm)	PN	Invert Level (m)	
1	73.100	0.900	Open Manhole	450	1.000	72.200	100			
2	72.900	1.137	Open Manhole	1200	1.001	71.763	150	1.000	71.813	100
3	72.600	1.373	Open Manhole	1200	1.002	71.227	150	1.001	71.227	150
4	72.450	1.305	Open Manhole	1200	1.003	71.145	150	1.002	71.145	150
16	72.250	1.174	Open Manhole	450	2.000	71.076	100			
5	72.100	1.222	Open Manhole	600	1.004	70.878	150	1.003	70.878	150
								2.000	70.928	100
17	72.000	0.829	Open Manhole	450	3.000	71.171	100			
6	72.100	1.362	Open Manhole	600	1.005	70.738	150	1.004	70.738	150
								3.000	70.788	100
18	72.200	1.114	Open Manhole	450	4.000	71.086	100			
19	72.100	1.178	Open Manhole	450	4.001	70.922	100	4.000	70.922	100
20	72.100	1.280	Open Manhole	450	4.002	70.820	100	4.001	70.820	100
7	72.000	1.450	Open Manhole	1200	1.006	70.550	150	1.005	70.550	150
								4.002	70.600	100
21	71.500	0.498	Open Manhole	450	5.000	71.002	100			
22	71.750	0.915	Open Manhole	450	5.001	70.835	100	5.000	70.835	100
23	72.000	1.348	Open Manhole	450	5.002	70.652	100	5.001	70.652	100
24	71.750	1.177	Open Manhole	450	6.000	70.573	100			
25	71.750	1.240	Open Manhole	450	6.001	70.510	100	6.000	70.510	100
8	71.850	1.509	Open Manhole	1200	1.007	70.341	225	1.006	70.416	150
								5.002	70.466	100
								6.001	70.466	100
9	71.850	1.517	Open Manhole	1200	1.008	70.333	225	1.007	70.333	225
10	71.750	1.443	Open Manhole	1200	1.009	70.307	225	1.008	70.307	225
11	71.750	1.470	Open Manhole	1200	1.010	70.280	225	1.009	70.280	225
12	71.750	1.480	Open Manhole	1200	1.011	70.270	225	1.010	70.270	225
13	70.500	0.571	Open Manhole	1200	1.012	69.929	225	1.011	69.929	225
14	70.000	0.505	Open Manhole	1200	1.013	69.495	225	1.012	69.495	225
15	69.900	0.468	Open Manhole	0		OUTFALL		1.013	69.432	225

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
1	-396962.638	-307552.133	-396962.638	-307552.133	Required	●

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LAND AT COEDWAY
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Manhole Schedules for COEDWAY.SWS

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
2	-396963.225	-307536.650	-396963.225	-307536.650	Required	
3	-396981.444	-307525.349	-396981.444	-307525.349	Required	
4	-396980.217	-307522.295	-396980.217	-307522.295	Required	
16	-396968.062	-307513.801	-396968.062	-307513.801	Required	
5	-396979.782	-307511.977	-396979.782	-307511.977	Required	
17	-396949.629	-307505.159	-396949.629	-307505.159	Required	
6	-396979.546	-307506.394	-396979.546	-307506.394	Required	
18	-396997.622	-307513.320	-396997.622	-307513.320	Required	
19	-396999.759	-307500.395	-396999.759	-307500.395	Required	
20	-396991.727	-307499.066	-396991.727	-307499.066	Required	
7	-396982.358	-307499.421	-396982.358	-307499.421	Required	
21	-396950.786	-307484.694	-396950.786	-307484.694	Required	
22	-396962.124	-307491.695	-396962.124	-307491.695	Required	
23	-396975.464	-307497.678	-396975.464	-307497.678	Required	
24	-396981.404	-307485.968	-396981.404	-307485.968	Required	

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Manhole Schedules for COEDWAY.SWS

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
25	-396981.442	-307491.017	-396981.442	-307491.017	Required	
8	-396982.893	-307494.116	-396982.893	-307494.116	Required	
9	-396985.110	-307493.037	-396985.110	-307493.037	Required	
10	-396989.708	-307490.798	-396989.708	-307490.798	Required	
11	-396989.899	-307485.279	-396989.899	-307485.279	Required	
12	-396989.964	-307483.382	-396989.964	-307483.382	Required	
13	-396990.141	-307478.266	-396990.141	-307478.266	Required	
14	-396991.375	-307471.877	-396991.375	-307471.877	Required	
15	-396992.275	-307469.517			No Entry	

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PIPELINE SCHEDULES for COEDWAY.SWS

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	100	1	73.100	72.200	0.800	Open Manhole	450
1.001	o	150	2	72.900	71.763	0.987	Open Manhole	1200
1.002	o	150	3	72.600	71.227	1.223	Open Manhole	1200
1.003	o	150	4	72.450	71.145	1.155	Open Manhole	1200
2.000	o	100	16	72.250	71.076	1.074	Open Manhole	450
1.004	o	150	5	72.100	70.878	1.072	Open Manhole	600
3.000	o	100	17	72.000	71.171	0.729	Open Manhole	450
1.005	o	150	6	72.100	70.738	1.212	Open Manhole	600
4.000	o	100	18	72.200	71.086	1.014	Open Manhole	450
4.001	o	100	19	72.100	70.922	1.078	Open Manhole	450
4.002	o	100	20	72.100	70.820	1.180	Open Manhole	450
1.006	o	150	7	72.000	70.550	1.300	Open Manhole	1200
5.000	o	100	21	71.500	71.002	0.398	Open Manhole	450
5.001	o	100	22	71.750	70.835	0.815	Open Manhole	450

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	15.494	40.0	2	72.900	71.813	0.987	Open Manhole	1200
1.001	21.440	40.0	3	72.600	71.227	1.223	Open Manhole	1200
1.002	3.291	40.1	4	72.450	71.145	1.155	Open Manhole	1200
1.003	10.327	38.7	5	72.100	70.878	1.072	Open Manhole	600
2.000	11.861	80.1	5	72.100	70.928	1.072	Open Manhole	600
1.004	5.587	39.9	6	72.100	70.738	1.212	Open Manhole	600
3.000	29.942	78.2	6	72.100	70.788	1.212	Open Manhole	600
1.005	7.519	40.0	7	72.000	70.550	1.300	Open Manhole	1200
4.000	13.100	79.9	19	72.100	70.922	1.078	Open Manhole	450
4.001	8.142	79.8	20	72.100	70.820	1.180	Open Manhole	450
4.002	9.375	42.6	7	72.000	70.600	1.300	Open Manhole	1200
1.006	5.333	39.8	8	71.850	70.416	1.284	Open Manhole	1200
5.000	13.325	79.8	22	71.750	70.835	0.815	Open Manhole	450
5.001	14.620	79.9	23	72.000	70.652	1.248	Open Manhole	450

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PIPELINE SCHEDULES for COEDWAY.SWS

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)
5.002	o	100	23	72.000	70.652	1.248	Open Manhole	450
6.000	o	100	24	71.750	70.573	1.077	Open Manhole	450
6.001	o	100	25	71.750	70.510	1.140	Open Manhole	450
1.007	o	225	8	71.850	70.341	1.284	Open Manhole	1200
1.008	o	225	9	71.850	70.333	1.292	Open Manhole	1200
1.009	o	225	10	71.750	70.307	1.218	Open Manhole	1200
1.010	o	225	11	71.750	70.280	1.245	Open Manhole	1200
1.011	o	225	12	71.750	70.270	1.255	Open Manhole	1200
1.012	o	225	13	70.500	69.929	0.346	Open Manhole	1200
1.013	o	225	14	70.000	69.495	0.280	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)
5.002	8.239	44.3	8	71.850	70.466	1.284	Open Manhole	1200
6.000	5.050	80.2	25	71.750	70.510	1.140	Open Manhole	450
6.001	3.422	77.8	8	71.850	70.466	1.284	Open Manhole	1200
1.007	2.466	300.0	9	71.850	70.333	1.292	Open Manhole	1200
1.008	5.114	200.0	10	71.750	70.307	1.218	Open Manhole	1200
1.009	5.523	200.0	11	71.750	70.280	1.245	Open Manhole	1200
1.010	1.898	200.0	12	71.750	70.270	1.255	Open Manhole	1200
1.011	5.119	15.0	13	70.500	69.929	0.346	Open Manhole	1200
1.012	6.507	15.0	14	70.000	69.495	0.280	Open Manhole	1200
1.013	2.525	40.0	15	69.900	69.432	0.243	Open Manhole	0

Free Flowing Outfall Details for COEDWAY.SWS

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D, L (mm)	W (mm)
1.013	15	69.900	69.432	0.000	0	0


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Simulation Criteria for COEDWAY.SWS

Volumetric Runoff Coeff	0.840	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	40.000
Hot Start (mins)	0	MADD Factor * 10m ³ /ha Storage	0.000
Hot Start Level (mm)	0	Run Time (mins)	120
Manhole Headloss Coeff (Global)	0.500	Output Interval (mins)	2
Number of Input Hydrographs	0	Number of Storage Structures	1
Number of Online Controls	1	Number of Time/Area Diagrams	0
Number of Offline Controls	0		

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Winter
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	18.000	Storm Duration (mins)	60
Ratio R	0.350		

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Online Controls for COEDWAY.SWS


Hydro-Brake® Optimum Manhole: 12, DS/PN: 1.011, Volume (m³): 1.7

Unit Reference	MD-SHE-0063-2000-1300-2000
Design Head (m)	1.300
Design Flow (l/s)	2.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	63
Invert Level (m)	70.270
Minimum Outlet Pipe Diameter (mm)	100
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.300	2.0
Flush-Flo™	0.280	1.7
Kick-Flo®	0.564	1.4
Mean Flow over Head Range	-	1.6

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)
0.100	1.4	1.200	1.9	3.000	2.9	7.000	4.4
0.200	1.7	1.400	2.1	3.500	3.2	7.500	4.5
0.300	1.7	1.600	2.2	4.000	3.4	8.000	4.6
0.400	1.6	1.800	2.3	4.500	3.5	8.500	4.8
0.500	1.5	2.000	2.4	5.000	3.7	9.000	4.9
0.600	1.4	2.200	2.5	5.500	3.9	9.500	5.0
0.800	1.6	2.400	2.6	6.000	4.1		
1.000	1.8	2.600	2.7	6.500	4.2		


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Storage Structures for COEDWAY.SWS

Tank or Pond Manhole: 10, DS/PN: 1.009

Invert Level (m) 70.308


Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	30.0	1.000	30.0	1.001	0.0

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Summary of Results for 60 minute 100 year Winter (COEDWAY.SWS)

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

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m ³)	Flow / Overflow Cap. (l/s)	Pipe Flow (l/s)	Status
1.000	1	72.200	-0.100	0.000	0.00	0.0	OK
1.001	2	71.836	-0.077	0.000	0.47	12.6	OK
1.002	3	71.320	-0.057	0.000	0.70	12.5	OK
1.003	4	71.287	-0.008	0.000	0.49	12.5	OK
2.000	16	71.284	0.108	0.000	0.36	2.3	SURCHARGED
1.004	5	71.281	0.253	0.000	0.64	14.8	SURCHARGED
3.000	17	71.282	0.011	0.000	0.34	2.3	SURCHARGED
1.005	6	71.277	0.389	0.000	0.72	17.5	SURCHARGED
4.000	18	71.276	0.090	0.000	0.36	2.3	SURCHARGED
4.001	19	71.275	0.253	0.000	0.35	2.2	SURCHARGED
4.002	20	71.273	0.353	0.000	0.26	2.3	SURCHARGED
1.006	7	71.272	0.572	0.000	0.81	18.7	SURCHARGED
5.000	21	71.274	0.172	0.000	0.36	2.3	FLOOD RISK
5.001	22	71.272	0.337	0.000	0.42	2.7	SURCHARGED
5.002	23	71.270	0.518	0.000	0.28	2.3	SURCHARGED
6.000	24	71.270	0.597	0.000	0.41	2.5	SURCHARGED
6.001	25	71.269	0.659	0.000	0.41	2.3	SURCHARGED
1.007	8	71.268	0.702	0.000	0.88	24.5	SURCHARGED
1.008	9	71.267	0.709	0.000	0.88	23.7	SURCHARGED
1.009	10	71.267	0.734	0.000	0.12	3.2	SURCHARGED
1.010	11	71.286	0.781	0.000	0.08	2.4	SURCHARGED
1.011	12	71.294	0.799	0.000	0.02	1.8	SURCHARGED
1.012	13	69.949	-0.205	0.000	0.02	1.8	OK
1.013	14	69.527	-0.193	0.000	0.05	1.8	OK

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STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for COEDWAY.SWS

Pipe Sizes COEDWAY Manhole Sizes COEDWAY

FSR Rainfall Model - England and Wales

Return Period (years)	100	PIMP (%)	100
M5-60 (mm)	18.000	Add Flow / Climate Change (%)	40
Ratio R	0.350	Minimum Backdrop Height (m)	0.200
Maximum Rainfall (mm/hr)	50	Maximum Backdrop Height (m)	0.000
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	1.200
Foul Sewage (l/s/ha)	0.000	Min Vel for Auto Design only (m/s)	0.75
Volumetric Runoff Coeff.	0.750	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Network Design Table for COEDWAY.SWS

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	15.494	0.387	40.0	0.000	5.00	0.0	0.600	o	100	Pipe/Conduit
1.001	21.440	0.536	40.0	0.043	0.00	0.0	0.600	o	150	Pipe/Conduit
1.002	3.291	0.082	40.1	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit
1.003	10.327	0.267	38.7	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit
2.000	11.861	0.148	80.1	0.008	5.00	0.0	0.600	o	100	Pipe/Conduit
1.004	5.587	0.140	39.9	0.004	0.00	0.0	0.600	o	150	Pipe/Conduit
3.000	29.942	0.383	78.2	0.008	5.00	0.0	0.600	o	100	Pipe/Conduit
1.005	7.519	0.188	40.0	0.003	0.00	0.0	0.600	o	150	Pipe/Conduit

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	E I.Area (ha)	E Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.000	50.00	5.21	72.200	0.000	0.0	0.0	0.0	1.22	9.6	0.0
1.001	50.00	5.44	71.763	0.043	0.0	0.0	2.3	1.60	28.2	8.2
1.002	50.00	5.47	71.227	0.043	0.0	0.0	2.3	1.59	28.2	8.2
1.003	50.00	5.58	71.145	0.043	0.0	0.0	2.3	1.62	28.7	8.2
2.000	50.00	5.23	71.076	0.008	0.0	0.0	0.4	0.86	6.8	1.5
1.004	50.00	5.63	70.878	0.055	0.0	0.0	3.0	1.60	28.2	10.4
3.000	50.00	5.57	71.171	0.008	0.0	0.0	0.4	0.87	6.8	1.5
1.005	50.00	5.71	70.738	0.066	0.0	0.0	3.6	1.60	28.2	12.5

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Network Design Table for COEDWAY.SWS

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
4.000	13.100	0.164	79.9	0.008	5.00	0.0	0.600	o	100	Pipe/Conduit
4.001	8.142	0.102	79.8	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit
4.002	9.375	0.220	42.6	0.001	0.00	0.0	0.600	o	100	Pipe/Conduit
1.006	5.333	0.134	39.8	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit
5.000	13.325	0.167	79.8	0.008	5.00	0.0	0.600	o	100	Pipe/Conduit
5.001	14.620	0.183	79.9	0.002	0.00	0.0	0.600	o	100	Pipe/Conduit
5.002	8.239	0.186	44.3	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit
6.000	5.050	0.063	80.2	0.009	5.00	0.0	0.600	o	100	Pipe/Conduit
6.001	3.422	0.044	77.8	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit
1.007	2.466	0.008	300.0	0.007	0.00	0.0	0.600	o	225	Pipe/Conduit
1.008	5.114	0.026	200.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit
1.009	5.523	0.028	200.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit
1.010	1.898	0.009	200.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit
1.011	5.119	0.341	15.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit
1.012	6.507	0.434	15.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit
1.013	2.525	0.063	40.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
4.000	50.00	5.25	71.086	0.008	0.0	0.0	0.4	0.86	6.8	1.5
4.001	50.00	5.41	70.922	0.008	0.0	0.0	0.4	0.86	6.8	1.5
4.002	50.00	5.54	70.820	0.009	0.0	0.0	0.5	1.18	9.3	1.7
1.006	50.00	5.77	70.550	0.075	0.0	0.0	4.1	1.60	28.3	14.2
5.000	50.00	5.26	71.002	0.008	0.0	0.0	0.4	0.86	6.8	1.5
5.001	50.00	5.54	70.835	0.010	0.0	0.0	0.5	0.86	6.8	1.9
5.002	50.00	5.66	70.652	0.010	0.0	0.0	0.5	1.16	9.1	1.9
6.000	50.00	5.10	70.573	0.009	0.0	0.0	0.5	0.86	6.8	1.7
6.001	50.00	5.16	70.510	0.009	0.0	0.0	0.5	0.87	6.9	1.7
1.007	50.00	5.82	70.341	0.101	0.0	0.0	5.5	0.75	29.8	19.1
1.008	50.00	5.92	70.333	0.101	0.0	0.0	5.5	0.92	36.6	19.1
1.009	50.00	6.02	70.307	0.101	0.0	0.0	5.5	0.92	36.6	19.1
1.010	50.00	6.05	70.280	0.101	0.0	0.0	5.5	0.92	36.6	19.1
1.011	50.00	6.07	70.270	0.101	0.0	0.0	5.5	3.39	135.0	19.1
1.012	50.00	6.11	69.929	0.101	0.0	0.0	5.5	3.40	135.1	19.1
1.013	50.00	6.13	69.495	0.101	0.0	0.0	5.5	2.07	82.5	19.1



Manhole Schedules for COEDWAY.SWS

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
1	73.100	0.900	Open Manhole	450	1.000	72.200	100				
2	72.900	1.137	Open Manhole	1200	1.001	71.763	150	1.000	71.813	100	
3	72.600	1.373	Open Manhole	1200	1.002	71.227	150	1.001	71.227	150	
4	72.450	1.305	Open Manhole	1200	1.003	71.145	150	1.002	71.145	150	
16	72.250	1.174	Open Manhole	450	2.000	71.076	100				
5	72.100	1.222	Open Manhole	600	1.004	70.878	150	1.003	70.878	150	
								2.000	70.928	100	
17	72.000	0.829	Open Manhole	450	3.000	71.171	100				
6	72.100	1.362	Open Manhole	600	1.005	70.738	150	1.004	70.738	150	
								3.000	70.788	100	
18	72.200	1.114	Open Manhole	450	4.000	71.086	100				
19	72.100	1.178	Open Manhole	450	4.001	70.922	100	4.000	70.922	100	
20	72.100	1.280	Open Manhole	450	4.002	70.820	100	4.001	70.820	100	
7	72.000	1.450	Open Manhole	1200	1.006	70.550	150	1.005	70.550	150	
								4.002	70.600	100	
21	71.500	0.498	Open Manhole	450	5.000	71.002	100				
22	71.750	0.915	Open Manhole	450	5.001	70.835	100	5.000	70.835	100	
23	72.000	1.348	Open Manhole	450	5.002	70.652	100	5.001	70.652	100	
24	71.750	1.177	Open Manhole	450	6.000	70.573	100				
25	71.750	1.240	Open Manhole	450	6.001	70.510	100	6.000	70.510	100	
8	71.850	1.509	Open Manhole	1200	1.007	70.341	225	1.006	70.416	150	
								5.002	70.466	100	
								6.001	70.466	100	
9	71.850	1.517	Open Manhole	1200	1.008	70.333	225	1.007	70.333	225	
10	71.750	1.443	Open Manhole	1200	1.009	70.307	225	1.008	70.307	225	
11	71.750	1.470	Open Manhole	1200	1.010	70.280	225	1.009	70.280	225	
12	71.750	1.480	Open Manhole	1200	1.011	70.270	225	1.010	70.270	225	
13	70.500	0.571	Open Manhole	1200	1.012	69.929	225	1.011	69.929	225	
14	70.000	0.505	Open Manhole	1200	1.013	69.495	225	1.012	69.495	225	
15	69.900	0.468	Open Manhole	0		OUTFALL		1.013	69.432	225	

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
1	-396962.638	-307552.133	-396962.638	-307552.133	Required	●

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LAND AT COEDWAY
POWYS



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Manhole Schedules for COEDWAY.SWS

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
2	-396963.225	-307536.650	-396963.225	-307536.650	Required	
3	-396981.444	-307525.349	-396981.444	-307525.349	Required	
4	-396980.217	-307522.295	-396980.217	-307522.295	Required	
16	-396968.062	-307513.801	-396968.062	-307513.801	Required	
5	-396979.782	-307511.977	-396979.782	-307511.977	Required	
17	-396949.629	-307505.159	-396949.629	-307505.159	Required	
6	-396979.546	-307506.394	-396979.546	-307506.394	Required	
18	-396997.622	-307513.320	-396997.622	-307513.320	Required	
19	-396999.759	-307500.395	-396999.759	-307500.395	Required	
20	-396991.727	-307499.066	-396991.727	-307499.066	Required	
7	-396982.358	-307499.421	-396982.358	-307499.421	Required	
21	-396950.786	-307484.694	-396950.786	-307484.694	Required	
22	-396962.124	-307491.695	-396962.124	-307491.695	Required	
23	-396975.464	-307497.678	-396975.464	-307497.678	Required	
24	-396981.404	-307485.968	-396981.404	-307485.968	Required	

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Manhole Schedules for COEDWAY.SWS

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
25	-396981.442	-307491.017	-396981.442	-307491.017	Required	
8	-396982.893	-307494.116	-396982.893	-307494.116	Required	
9	-396985.110	-307493.037	-396985.110	-307493.037	Required	
10	-396989.708	-307490.798	-396989.708	-307490.798	Required	
11	-396989.899	-307485.279	-396989.899	-307485.279	Required	
12	-396989.964	-307483.382	-396989.964	-307483.382	Required	
13	-396990.141	-307478.266	-396990.141	-307478.266	Required	
14	-396991.375	-307471.877	-396991.375	-307471.877	Required	
15	-396992.275	-307469.517			No Entry	

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PIPELINE SCHEDULES for COEDWAY.SWS

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	100	1	73.100	72.200	0.800	Open Manhole	450
1.001	o	150	2	72.900	71.763	0.987	Open Manhole	1200
1.002	o	150	3	72.600	71.227	1.223	Open Manhole	1200
1.003	o	150	4	72.450	71.145	1.155	Open Manhole	1200
2.000	o	100	16	72.250	71.076	1.074	Open Manhole	450
1.004	o	150	5	72.100	70.878	1.072	Open Manhole	600
3.000	o	100	17	72.000	71.171	0.729	Open Manhole	450
1.005	o	150	6	72.100	70.738	1.212	Open Manhole	600
4.000	o	100	18	72.200	71.086	1.014	Open Manhole	450
4.001	o	100	19	72.100	70.922	1.078	Open Manhole	450
4.002	o	100	20	72.100	70.820	1.180	Open Manhole	450
1.006	o	150	7	72.000	70.550	1.300	Open Manhole	1200
5.000	o	100	21	71.500	71.002	0.398	Open Manhole	450
5.001	o	100	22	71.750	70.835	0.815	Open Manhole	450

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	15.494	40.0	2	72.900	71.813	0.987	Open Manhole	1200
1.001	21.440	40.0	3	72.600	71.227	1.223	Open Manhole	1200
1.002	3.291	40.1	4	72.450	71.145	1.155	Open Manhole	1200
1.003	10.327	38.7	5	72.100	70.878	1.072	Open Manhole	600
2.000	11.861	80.1	5	72.100	70.928	1.072	Open Manhole	600
1.004	5.587	39.9	6	72.100	70.738	1.212	Open Manhole	600
3.000	29.942	78.2	6	72.100	70.788	1.212	Open Manhole	600
1.005	7.519	40.0	7	72.000	70.550	1.300	Open Manhole	1200
4.000	13.100	79.9	19	72.100	70.922	1.078	Open Manhole	450
4.001	8.142	79.8	20	72.100	70.820	1.180	Open Manhole	450
4.002	9.375	42.6	7	72.000	70.600	1.300	Open Manhole	1200
1.006	5.333	39.8	8	71.850	70.416	1.284	Open Manhole	1200
5.000	13.325	79.8	22	71.750	70.835	0.815	Open Manhole	450
5.001	14.620	79.9	23	72.000	70.652	1.248	Open Manhole	450

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PIPELINE SCHEDULES for COEDWAY.SWS

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)
5.002	o	100	23	72.000	70.652	1.248	Open Manhole	450
6.000	o	100	24	71.750	70.573	1.077	Open Manhole	450
6.001	o	100	25	71.750	70.510	1.140	Open Manhole	450
1.007	o	225	8	71.850	70.341	1.284	Open Manhole	1200
1.008	o	225	9	71.850	70.333	1.292	Open Manhole	1200
1.009	o	225	10	71.750	70.307	1.218	Open Manhole	1200
1.010	o	225	11	71.750	70.280	1.245	Open Manhole	1200
1.011	o	225	12	71.750	70.270	1.255	Open Manhole	1200
1.012	o	225	13	70.500	69.929	0.346	Open Manhole	1200
1.013	o	225	14	70.000	69.495	0.280	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)
5.002	8.239	44.3	8	71.850	70.466	1.284	Open Manhole	1200
6.000	5.050	80.2	25	71.750	70.510	1.140	Open Manhole	450
6.001	3.422	77.8	8	71.850	70.466	1.284	Open Manhole	1200
1.007	2.466	300.0	9	71.850	70.333	1.292	Open Manhole	1200
1.008	5.114	200.0	10	71.750	70.307	1.218	Open Manhole	1200
1.009	5.523	200.0	11	71.750	70.280	1.245	Open Manhole	1200
1.010	1.898	200.0	12	71.750	70.270	1.255	Open Manhole	1200
1.011	5.119	15.0	13	70.500	69.929	0.346	Open Manhole	1200
1.012	6.507	15.0	14	70.000	69.495	0.280	Open Manhole	1200
1.013	2.525	40.0	15	69.900	69.432	0.243	Open Manhole	0

Free Flowing Outfall Details for COEDWAY.SWS

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D, L (mm)	W (mm)
1.013	15	69.900	69.432	0.000	0	0


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Simulation Criteria for COEDWAY.SWS

Volumetric Runoff Coeff	0.840	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	40.000
Hot Start (mins)	0	MADD Factor * 10m ³ /ha Storage	0.000
Hot Start Level (mm)	0	Run Time (mins)	1200
Manhole Headloss Coeff (Global)	0.500	Output Interval (mins)	10
Number of Input Hydrographs		0 Number of Storage Structures	
Number of Online Controls		1 Number of Time/Area Diagrams	
Number of Offline Controls		0	

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Winter
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	18.000	Storm Duration (mins)	600
Ratio R	0.350		

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Online Controls for COEDWAY.SWS


Hydro-Brake® Optimum Manhole: 12, DS/PN: 1.011, Volume (m³): 1.7

Unit Reference	MD-SHE-0063-2000-1300-2000
Design Head (m)	1.300
Design Flow (l/s)	2.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	63
Invert Level (m)	70.270
Minimum Outlet Pipe Diameter (mm)	100
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.300	2.0
Flush-Flo™	0.280	1.7
Kick-Flo®	0.564	1.4
Mean Flow over Head Range	-	1.6

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)
0.100	1.4	1.200	1.9	3.000	2.9	7.000	4.4
0.200	1.7	1.400	2.1	3.500	3.2	7.500	4.5
0.300	1.7	1.600	2.2	4.000	3.4	8.000	4.6
0.400	1.6	1.800	2.3	4.500	3.5	8.500	4.8
0.500	1.5	2.000	2.4	5.000	3.7	9.000	4.9
0.600	1.4	2.200	2.5	5.500	3.9	9.500	5.0
0.800	1.6	2.400	2.6	6.000	4.1		
1.000	1.8	2.600	2.7	6.500	4.2		


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Storage Structures for COEDWAY.SWS

Tank or Pond Manhole: 10, DS/PN: 1.009

Invert Level (m) 70.308

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	30.0	1.000	30.0	1.001	0.0

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Summary of Results for 600 minute 100 year Winter (COEDWAY.SWS)

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

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m ³)	Flow / Overflow Cap. (l/s)	Pipe Flow (l/s)	Status
1.000	1	72.200	-0.100	0.000	0.00	0.0	OK
1.001	2	71.793	-0.120	0.000	0.09	2.4	OK
1.002	3	71.277	-0.100	0.000	0.13	2.4	OK
1.003	4	71.276	-0.019	0.000	0.09	2.4	OK
2.000	16	71.275	0.099	0.000	0.07	0.4	SURCHARGED
1.004	5	71.274	0.246	0.000	0.13	3.1	SURCHARGED
3.000	17	71.274	0.003	0.000	0.07	0.4	SURCHARGED
1.005	6	71.272	0.384	0.000	0.15	3.6	SURCHARGED
4.000	18	71.272	0.086	0.000	0.07	0.4	SURCHARGED
4.001	19	71.270	0.248	0.000	0.07	0.4	SURCHARGED
4.002	20	71.269	0.349	0.000	0.06	0.5	SURCHARGED
1.006	7	71.269	0.569	0.000	0.17	3.9	SURCHARGED
5.000	21	71.270	0.168	0.000	0.07	0.4	FLOOD RISK
5.001	22	71.269	0.334	0.000	0.09	0.6	SURCHARGED
5.002	23	71.267	0.515	0.000	0.06	0.5	SURCHARGED
6.000	24	71.267	0.594	0.000	0.08	0.5	SURCHARGED
6.001	25	71.267	0.657	0.000	0.08	0.5	SURCHARGED
1.007	8	71.266	0.700	0.000	0.18	5.1	SURCHARGED
1.008	9	71.266	0.708	0.000	0.19	5.0	SURCHARGED
1.009	10	71.265	0.733	0.000	0.07	2.0	SURCHARGED
1.010	11	71.281	0.776	0.000	0.06	1.9	SURCHARGED
1.011	12	71.282	0.787	0.000	0.02	1.8	SURCHARGED
1.012	13	69.949	-0.205	0.000	0.02	1.8	OK
1.013	14	69.527	-0.193	0.000	0.05	1.8	OK