Appendix E – Surface Water Drainage Proposals

SCALE 1:500

0m 20m 40m 60m 80m

KEY:

SURFACE WATER PIPE

SURFACE WATER MANHOLE

SOAKAWAY

Notes:

1. THIS DRAWING TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT MONSON DRAWINGS AND SPECIFICATIONS, ANY DISCREPANCIES TO BE REPORTED TO MONSON PRIOR TO ANY FABRICATION OR WORK COMMENCING ON SITE.

2. DO NOT SCALE THIS DRAWING, USE FIGURED DIMENSIONS ONLY.

3. ALL DIMENSIONS IN MILLIMETRES, ALL LEVELS IN METRES.

Issue	By	Date	Amendments
A	MW	03/10/16	Original issue

MONSON

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Project:
Old Ashford Road
Lenham
Kent

Description:
Surface Water
Drainage Layout

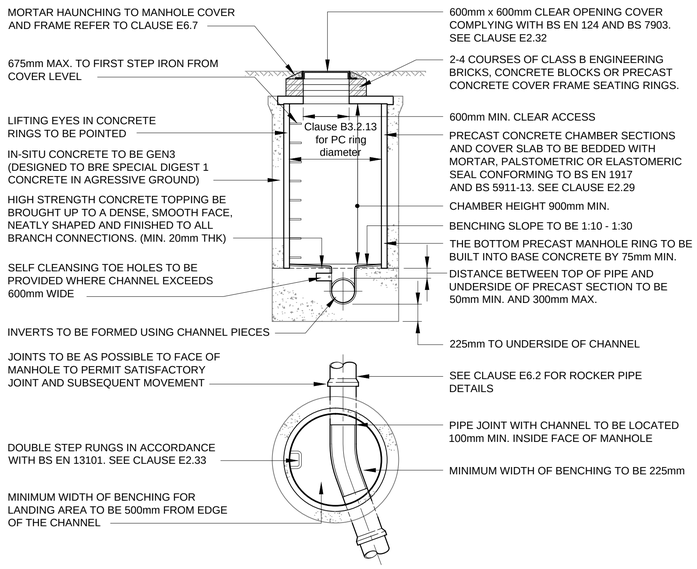
Original Drawing:	Prepared	MW	Approved	GL	
Origin: Crowborough			Size	A1	
Current Issue:	Approved	GL	Date	03/10/16	
Drawing Status:	PRELIMINARY				

Scale:	Dwg No:	Issue:
1:500	5960Q /101	A

ISSUE SHEET

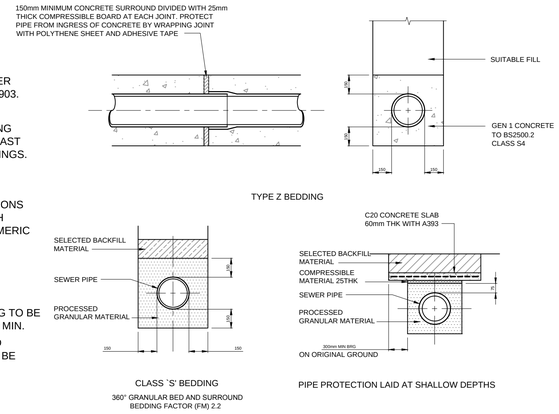
MSL 84 APPROVED DEC 2012 ISSUE No. 6

Surface Water Manhole Schedule									Surface Water Manhole Schedule								
Reference	Chamber Type	Diameter (mm)	Cover Level	Invert Level	Depth to Invert (m)	Depth to Soffit (m)	Nom Pipe Size (mm)	Cover Type	Reference	Chamber Type	Diameter (mm)	Cover Level	Invert Level	Depth to Invert (m)	Depth to Soffit (m)	Nom Pipe Size (mm)	Cover Type
SW01	TYPE 4 PPIC (S)	450	110.10	109.50	0.6	0.5	100	A15	SW65	PE 4 PPIC	450	110.60	109.55	1.05	0.95	100	A15
SW02	TYPE 4 PPIC (S)	450	110.10	109.35	0.75	0.65	100	A15	SW66	YPE 4 PPIC	450	111.45	110.75	0.7	0.6	100	D400
SW03	TYPE 4 PPIC (S)	450	110.10	109.50	0.6	0.5	100	A15	SW67	YPE 4 PPIC	450	111.45	110.65	0.8	0.7	100	D400
SW04	TYPE 4 PPIC (S)	450	110.10	109.35	0.75	0.65	100	A15	SW68	PE 4 PPIC	450	111.45	110.75	0.7	0.6	100	A15
SW05	TYPE 4 PPIC (S)	450	110.10	109.50	0.6	0.5	100	A15	SW69	PE 4 PPIC	450	111.45	110.656	0.794	0.694	100	A15
SW06	TYPE 4 PPIC	450	110.10	109.30	0.8	0.7	100	B125	SW70	PE 4 PPIC	450	110.60	109.70	0.9	0.8	100	A15
SW07	TYPE 4 PPIC (S)	450	110.10	109.16	0.94	0.84	100	A15	SW71	PE 4 PPIC	450	110.60	109.50	1.1	1	100	A15
SW08	TYPE 4 PPIC (S)	450	110.20	109.70	0.5	0.4	100	A15	SW72	PE 4 PPIC	450	112.45	111.80	0.65	0.55	100	A15
SW09	TYPE 4 PPIC (S)	450	110.20	109.60	0.6	0.5	100	A15	SW73	PE 4 PPIC	450	111.58	110.88	0.7	0.6	100	A15
SW10	TYPE 4 PPIC (S)	450	110.20	109.45	0.75	0.65	100	A15	SW74	PE 4 PPIC	450	111.60	110.50	1.1	1	100	A15
SW11	TYPE 4 PPIC (S)	450	110.20	109.35	0.85	0.75	100	A15	SW75	PE 4 PPIC	450	111.58	110.88	0.7	0.6	100	A15
SW12	TYPE 4 PPIC (S)	450	110.20	109.70	0.5	0.4	100	A15	SW76	PE 4 PPIC	450	111.60	110.73	0.87	0.77	100	A15
SW13	TYPE 4 PPIC (S)	450	110.20	109.60	0.6	0.5	100	A15	SW77	PE 4 PPIC	450	112.80	112.10	0.7	0.6	100	A15
SW14	TYPE 4 PPIC	450	110.10	109.40	0.7	0.55	150	B125	SW78	PE 4 PPIC	450	112.80	111.95	0.85	0.75	100	A15
SW15	TYPE 4 PPIC	450	110.10	109.30	0.8	0.65	150	B125	SW79	PE 4 PPIC	450	112.80	111.60	1.2	1.1	100	A15
SW16	TYPE 4 PPIC	450	110.10	109.20	0.9	0.8	100	B125	SW80	YPE 4 PPIC	450	112.80	112.10	0.7	0.6	100	B125
SW17	TYPE 4 PPIC (s)	450	110.10	109.50	0.6	0.5	100	A15	SW81	YPE 4 PPIC	450	112.80	112.00	0.8	0.7	100	B125
SW18	TYPE 4 PPIC (s)	450	110.44	109.69	0.75	0.65	100	A15	SW82	PE 4 PPIC	450	112.80	111.65	1.15	1.05	100	A15
SW19	TYPE 4 PPIC (s)	450	110.44	109.59	0.85	0.75	100	A15	SW83	PE 4 PPIC	450	111.60	110.65	0.95	0.85	100	A15
SW20	TYPE 4 PPIC (s)	450	110.00	109.20	0.8	0.7	100	A15	SW84	PE 4 PPIC	450	112.60	111.90	0.7	0.6	100	A15
SW21	TYPE 4 PPIC (s)	450	110.00	109.45	0.55	0.45	100	A15	SW85	YPE 4 PPIC	450	112.60	111.75	0.85	0.75	100	D400
SW22	TYPE 4 PPIC (s)	450	110.00	109.45	0.55	0.45	100	A15	SW86	YPE 4 PPIC	450	112.60	111.45	1.15	1.05	100	D400
SW23	TYPE 4 PPIC	450	110.00	109.45	0.55	0.45	100	B125	SW87	PE 4 PPIC	450	112.60	111.90	0.7	0.6	100	A15
SW24	TYPE 4 PPIC	450	110.00	109.64	0.36	0.26	100	B125	SW88	YPE 4 PPIC	450	112.65	111.95	0.7	0.6	100	B125
SW25	TYPE 4 PPIC (s)	450	109.80	109.25	0.55	0.45	100	A15	SW89	YPE 4 PPIC	450	112.65	111.55	1.1	1	100	B125
SW26	TYPE 4 PPIC	450	109.80	109.10	0.7	0.6	100	B125	SW90	PE 4 PPIC	450	112.60	111.90	0.7	0.6	100	A15
SW27	TYPE 4 PPIC	450	109.80	109.25	0.55	0.45	100	B125	SW91	YPE 4 PPIC	450	112.55	111.85	0.7	0.6	100	B125
SW28	TYPE 4 PPIC (S)	450	109.70	109.10	0.6	0.5	100	A15	SW92	YPE 4 PPIC	450	112.45	111.70	0.75	0.65	100	B125
SW29	TYPE 4 PPIC (S)	450	109.70	108.98	0.72	0.62	100	A15	SW93	PE 4 PPIC	450	112.50	111.80	0.7	0.6	100	A15
SW30	TYPE 4 PPIC (S)	450	109.70	108.96	0.74	0.64	100	A15	SW94	PE 4 PPIC	450	112.50	111.50	1	0.9	100	A15
SW31	TYPE 4 PPIC (S)	450	109.70	108.83	0.87	0.77	100	A15	SW95	YPE 4 PPIC	450	112.55	111.55	1	0.9	100	D400
SW32	TYPE 4 PPIC (S)	450	109.70	108.63	1.07	0.97	100	A15	SW96	YPE 4 PPIC	450	112.55	111.40	1.15	1.05	100	D400
SW33	TYPE 4 PPIC (s)	450	109.70	109.00	0.7	0.6	100	A15	SW97	PE 4 PPIC	450	112.50	111.50	1	0.9	100	A15
SW34	TYPE 4 PPIC	450	109.70	108.80	0.9	0.8	100	B125	SW98	YPE 4 PPIC	450	112.45	111.85	0.6	0.5	100	D400
SW35	TYPE 4 PPIC (s)	450	109.65	109.10	0.55	0.45	100	A15	SW99	YPE 4 PPIC	450	112.45	111.55	0.9	0.8	100	D400
SW36	TYPE 4 PPIC	450	109.65	109.00	0.65	0.55	100	B125	SW100	PE 4 PPIC	450	112.45	111.85	0.6	0.5	100	A15
SW37	TYPE 4 PPIC	450	109.65	108.84	0.81	0.71	100	B125	SW101	Type 2	1200	112.97	111.62	1.35	1.2	150	D400
SW38	TYPE 4 PPIC	450	109.65	108.82	0.83	0.73	100	B125	SW102	Type 2	1200	112.85	111.45	1.4	1.25	150	D400
SW39	TYPE 4 PPIC (s)	450	109.65	109.00	0.65	0.55	100	A15	SW103	Type 2	1200	112.32	110.97	1.35	1.2	150	D400
SW40	TYPE 4 PPIC (s)	450	109.65	109.20	0.45	0.35	100	A15	SW104	Type 2	1200	111.93	110.58	1.35	1.2	150	D400
SW41	TYPE 4 PPIC (s)	450	109.65	109.00	0.65	0.55	100	A15	SW105	Type 2	1200	111.68	110.33	1.35	1.2	150	D400
SW42	TYPE 4 PPIC (s)	450	109.65	108.88	0.77	0.67	100	A15	SW106	Type 2	1200	111.01	109.66	1.35	1.2	150	D400
SW43	TYPE 4 PPIC (s)	450	109.60	109.00	0.6	0.5	100	A15	SW107	Type 2	1200	110.47	109.12	1.35	1.2	150	D400
SW44	TYPE 4 PPIC (s)	450	109.60	108.80	0.8	0.7	100	A15	SW108	Type 2	1200	109.80	108.45	1.35	1.2	150	D400
SW45	TYPE 4 PPIC	450	109.60	108.68	0.92	0.82	100	B125	CP01	CATCHPIT	600	110.10	109.25	0.85	0.75	100	B125
SW46	TYPE 4 PPIC	450	109.60	108.58	1.02	0.92	100	B125	CP02	CATCHPIT	600	110.10	109.10	1	0.9	100	B125
SW47	TYPE 4 PPIC	450	109.60	109.00	0.6	0.5	100	B125	CP03	CATCHPIT	600	110.20	109.25	0.95	0.85	100	B125
SW48	TYPE 4 PPIC (s)	450	109.60	109.00	0.6	0.5	100	A15	CP04	CATCHPIT	600	110.20	109.25	0.95	0.85	100	B125
SW49	TYPE 4 PPIC	450	109.60	108.80	0.8	0.7	100	B125	CP05	CATCHPIT	600	110.10	109.00	1.1	1	100	B125
SW50	TYPE 4 PPIC (s)	450	111.15	110.55	0.6	0.5	100	A15	CP06	CATCHPIT	600	110.00	109.100	0.9	0.8	100	B125
SW51	TYPE 4 PPIC (s)	450	111.15	110.43	0.72	0.62	100	A15	CP07	CATCHPIT	600	110.00	109.20	0.8	0.7	100	B125
SW52	TYPE 4 PPIC (s)	450	111.15	110.23	0.92	0.82	100	A15	CP08	CATCHPIT	600	109.80	109.05	0.75	0.65	100	B125
SW53	TYPE 4 PPIC (s)	450	111.15	110.55	0.6	0.5	100	A15	CP09	CATCHPIT	600	109.70	108.55	1.15	1.05	100	B125
SW54	TYPE 4 PPIC	450	111.15	110.35	0.8	0.7	100	D400	CP10	CATCHPIT	600	109.65	108.80	0.85	0.75	100	B125
SW55	TYPE 4 PPIC	450	111.15	110.20	0.95	0.85	100	D400	CP11	CATCHPIT	600	109.60	108.45	1.15	1.05	100	B125
SW56	TYPE 4 PPIC	450	111.45	110.65	0.8	0.7	100	B125	CP12	CATCHPIT	600	111.15	110.00	1.15	1.05	100	B125
SW57	TYPE 4 PPIC	450	111.45	110.53	0.92	0.82	100	B125	CP13	CATCHPIT	600	109.30	109.30	0	-0.15	150	B125
SW58	TYPE 4 PPIC	450	111.30	110.40	0.9	0.8	100	B125	CP14	CATCHPIT	600	109.30	109.30	0	-0.15	150	B125
SW59	TYPE 4 PPIC (s)	450	110.60	109.90	0.7	0.6	100	A15	CP15	CATCHPIT	600	112.80	111.50	1.3	1.15	150	B125
SW60	TYPE 4 PPIC (s)	450	110.60	109.60	1	0.9	100	A15	CP16	CATCHPIT	600	111.60	110.60	1	0.9	100	B125
SW61	TYPE 4 PPIC (s)	450	111.60	110.50	1.1	1	100	A15	CP17	CATCHPIT	600	111.45	110.35	1.1	1	100	B125
SW62	TYPE 4 PPIC (s)	450	111.60	109.45	2.15	2.05	100	A15	CP18	CATCHPIT	600	112.60	111.70	0.9	0.8	100	B125
SW63	TYPE 4 PPIC	450	110.60	109.90	0.7	0.6	100	D400	CP19	CATCHPIT	600	112.50	111.16	1.34	1.19	150	B125
SW64	TYPE 4 PPIC (s)	450	110.60	109.60	1	0.9	100	A15	CP20	CATCHPIT	600	111.45	110.85	0.6	0.5	100	B125



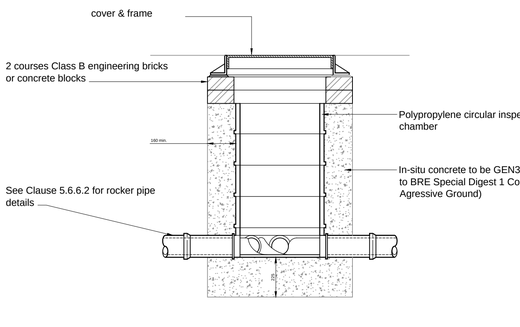
TYPICAL MANHOLE DETAIL - TYPE 2

(Maximum depth from cover level to soffit of pipe 3.0m)



NOMINAL SIZE (DN)	PIPE BEDDING REQUIREMENTS (mm)
150	10 or 14 nominal single size or 14 to 15 graded
225 to 525	10, 14 or 20 nominal single size or 14 to 5 graded or 20 to 5 graded
600 and above	10, 14, 20 or 40 nominal size crushed rock or 14 to 5 graded or 20 to 5 graded or 40 to 5 graded

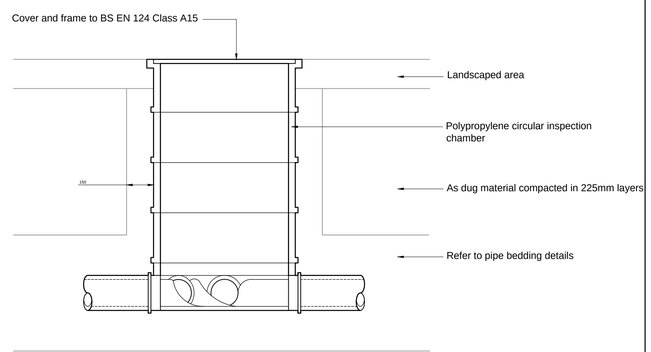
TYPICAL STORAGE CELL SECTION



POLYPROPYLENE INSPECTION CHAMBER. PPIC

Located within areas ACCESSIBLE to motor vehicles, road or access drive, for max depth 1.20m to invert.

To be used with approval of Building Control Officer or Approved Inspector



POLYPROPYLENE INSPECTION CHAMBER PPIC(S)

(located within private areas INACCESSIBLE to motor vehicles for depths to invert not greater than 1.20m)

Notes:
1. THIS DRAWING TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT MONSON DRAWINGS AND SPECIFICATIONS, ANY DISCREPANCIES TO BE REPORTED TO MONSON PRIOR TO ANY FABRICATION OR WORK COMMENCING ON SITE.
2. DO NOT SCALE THIS DRAWING, USE FIGURED DIMENSIONS ONLY.
3. ALL DIMENSIONS IN MILLIMETRES, ALL LEVELS IN METRES.

Issue	By	Date	Amendments
A	MW	03/10/16	Original issue

MONSON
Broadway Chambers, High Street, Crowborough, East Sussex TN6 1DF
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Project: Old Ashford Road, Lenham, Kent

Description: Surface Water Drainage Standard Details

Original Drawing: Prepared MW Approved GL
Origin: Crowborough Size A1
Current Issue: Approved GL Date 03/10/16
Drawing Status: PRELIMINARY

Scale: N T S
Dwg No: 5960Q/102
Issue: A

SCALE 1:500

0m 20m 40m 60m 80m

KEY:

SURFACE WATER PIPE

SURFACE WATER MANHOLE

SOAKAWAY

N

ASHFORD ROAD

OLD ASHFORD ROAD

GROOM WAY

TCB (RAC)

Track

109.4m

Sluice

Warehouse

Warehouse

Lanrig

The Marvel

Notes:

1. THIS DRAWING TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT MONSON DRAWINGS AND SPECIFICATIONS. ANY DISCREPANCIES TO BE REPORTED TO MONSON PRIOR TO ANY FABRICATION OR WORK COMMENCING ON SITE.

2. DO NOT SCALE THIS DRAWING, USE FIGURED DIMENSIONS ONLY.

3. ALL DIMENSIONS IN MILLIMETRES, ALL LEVELS IN METRES.

Issue	By	Date	Amendments
A	MW	03/10/16	Original issue

MONSON

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Project:
Old Ashford Road
Lenham
Kent

Description:
Preliminary Surface Water Drainage Layout

Original Drawing:	Prepared	MW	Approved	GL	
Origin: Crowborough			Size	A1	
Current Issue:	Approved	GL	Date	03/10/16	
Drawing Status:	PRELIMINARY				

Scale:	Dwg No:	Issue:
1:500	5960Q /105	A

ISSUE SHEET

MEL 64 APPROVED DEC 2012 ISSUE No. 6

Appendix F – Foul Water Drainage Proposals

SCALE 1:500

0m 20m 40m 60m 80m

KEY:

FOUL WATER PIPE

FOUL WATER MANHOLE

INDICATIVE EXISTING SEWER

N

ASHFORD ROAD

GROOM WAY

OLD ASHFORD ROAD

TCB (RAC)

Sluice

109.4m

109.4m

Surface Water Manhole Schedule								
Reference	Chamber Type	Diameter (mm)	Cover Level	Invert Level	Depth to Invert (m)	Depth to Soffit (m)	Nom Pipe Size (mm)	Cover Type
FW01	TYPE 4 PPIC	600	112.85	111.04	1.81	1.66	150	D400
FW02	TYPE 4 PPIC	600	112.32	110.85	1.47	1.32	150	D400
FW03	TYPE 4 PPIC	600	111.10	109.75	1.35	1.2	150	D400
FW04	TYPE 4 PPIC	600	110.78	109.43	1.35	1.2	150	D400
FW05	TYPE 4 PPIC	600	110.00	108.30	1.7	1.55	150	D400
FW06	Type 2	1200	109.75	106.54	3.21	3.06	150	D400
FW07	Type 2	1200	110.00	106.50	3.5	2.6	900	D400
FW08	Type 1	1200	109.56	105.25	4.31	3.41	900	D400
FW09	TYPE 4 PPIC	600	112.55	110.800	1.75	1.6	150	D400
FW10	TYPE 4 PPIC	600	111.45	110.10	1.35	1.2	150	D400
FW11	TYPE 4 PPIC	600	111.45	110.00	1.45	1.3	150	D400
FW12	TYPE 4 PPIC	600	110.60	109.25	1.35	1.2	150	D400
FW13	TYPE 4 PPIC	600	110.60	109.05	1.55	1.4	150	D400
FW14	TYPE 4 PPIC (s)	600	10.60	108.55	-97.95	-98.1	150	B125
FW15	TYPE 4 PPIC (s)	450	110.60	110.00	0.6	0.5	100	A15
FW16	TYPE 4 PPIC (s)	450	110.60	109.70	0.9	0.8	100	A15
FW17	TYPE 4 PPIC (s)	450	110.60	109.50	1.1	1	100	A15
FW18	TYPE 4 PPIC (s)	450	111.58	110.28	1.3	1.2	100	A15
FW19	TYPE 4 PPIC (s)	450	111.58	110.28	1.3	1.2	100	A15
FW20	TYPE 4 PPIC (s)	450	111.60	109.80	1.8	1.7	100	A15
FW21	TYPE 4 PPIC (s)	450	112.45	111.15	1.3	1.2	100	A15
FW22	TYPE 4 PPIC (s)	450	111.58	111.00	0.58	0.48	100	A15
FW23	TYPE 4 PPIC	450	112.55	111.25	1.3	1.2	100	B125
FW24	TYPE 4 PPIC	450	112.55	111.15	1.4	1.3	100	B125
FW25	TYPE 4 PPIC	450	112.55	111.25	1.3	1.2	100	B125
FW26	TYPE 4 PPIC	450	112.55	111.15	1.4	1.3	100	B125
FW27	TYPE 4 PPIC	450	112.70	111.30	1.4	1.3	100	B125
FW28	TYPE 4 PPIC	450	112.60	111.15	1.45	1.35	100	B125
FW29	TYPE 4 PPIC	450	112.65	111.25	1.4	1.3	100	B125
FW30	TYPE 4 PPIC	450	112.65	111.15	1.5	1.4	100	B125
FW31	TYPE 4 PPIC	450	112.55	111.15	1.4	1.3	100	B125
FW32	TYPE 4 PPIC	450	112.55	111.00	1.55	1.45	100	B125
FW33	TYPE 4 PPIC	450	112.05	110.75	1.3	1.2	100	B125
FW34	TYPE 4 PPIC	450	112.05	110.62	1.43	1.33	100	B125
FW35	TYPE 4 PPIC (s)	450	111.60	110.60	1	0.9	100	A15
FW36	TYPE 4 PPIC (s)	450	111.60	110.50	1.1	1	100	A15
FW37	TYPE 4 PPIC (s)	450	111.60	110.40	1.2	1.1	100	A15
FW38	TYPE 4 PPIC (s)	450	111.15	110.50	0.65	0.55	100	A15
FW39	TYPE 4 PPIC (s)	450	111.15	110.40	0.75	0.65	100	A15
FW40	TYPE 4 PPIC (s)	450	111.15	110.40	0.75	0.65	100	A15
FW41	TYPE 4 PPIC	450	111.15	110.00	1.15	1.05	100	B125
FW42	TYPE 4 PPIC	450	111.45	110.15	1.3	1.2	100	B125
FW43	TYPE 4 PPIC	450	111.45	110.00	1.45	1.35	100	B125
FW44	TYPE 4 PPIC	450	111.45	110.00	1.45	1.35	100	B125
FW45	TYPE 4 PPIC	450	110.10	109.50	0.6	0.5	100	B125
FW46	TYPE 4 PPIC	450	110.10	109.30	0.8	0.7	100	B125
FW47	TYPE 4 PPIC (s)	450	110.10	109.10	1	0.9	100	B125
FW48	TYPE 4 PPIC (s)	450	110.20	108.60	1.6	1.5	100	A15
FW49	TYPE 4 PPIC	450	110.20	108.45	1.75	1.65	100	B125
FW50	TYPE 4 PPIC	450	110.10	108.10	2	1.9	100	B125
FW51	TYPE 4 PPIC	450	110.20	109.00	1.2	1.1	100	B125
FW52	TYPE 4 PPIC	450	110.20	108.80	1.4	1.3	100	B125
FW53	TYPE 4 PPIC	450	110.10	109.20	0.9	0.8	100	B125
FW54	TYPE 4 PPIC	450	109.45	108.85	0.6	0.5	100	B125
FW55	TYPE 4 PPIC	450	109.60	108.75	0.85	0.75	100	B125
FW56	TYPE 4 PPIC	450	109.60	108.65	0.95	0.85	100	B125
FW57	TYPE 4 PPIC	450	109.45	108.40	1.05	0.95	100	B125
FW58	TYPE 4 PPIC	450	109.50	108.05	1.45	1.35	100	D400
FW59	TYPE 4 PPIC	1200	109.65	107.50	2.15	2.05	100	D400
FW60	TYPE 2	1200	109.70	107.30	2.4	2.3	100	D400
FW61	TYPE 2	1200	109.90	107.05	2.85	2.7	150	D400
FW62	TYPE 4 PPIC	450	109.65	108.80	0.85	0.75	100	B125
FW63	TYPE 4 PPIC	450	109.65	108.50	1.15	1.05	100	B125
FW64	TYPE 4 PPIC	450	109.60	109.00	0.6	0.5	100	B125
FW65	TYPE 4 PPIC	450	109.60	108.70	0.9	0.8	100	B125
FW66	TYPE 4 PPIC	450	109.70	109.10	0.6	0.5	100	B125
FW67	TYPE 4 PPIC	450	109.70	108.70	1	0.9	100	B125
FW68	TYPE 4 PPIC	450	109.95	109.10	0.85	0.75	100	B125
FW69	TYPE 4 PPIC	450	110.00	109.35	0.65	0.55	100	B125

Notes:

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2. DO NOT SCALE THIS DRAWING, USE FIGURED DIMENSIONS ONLY.
3. ALL DIMENSIONS IN MILLIMETRES, ALL LEVELS IN METRES.

Issue	By	Date	Amendments
A	MW	03/10/16	Original issue

MONSON

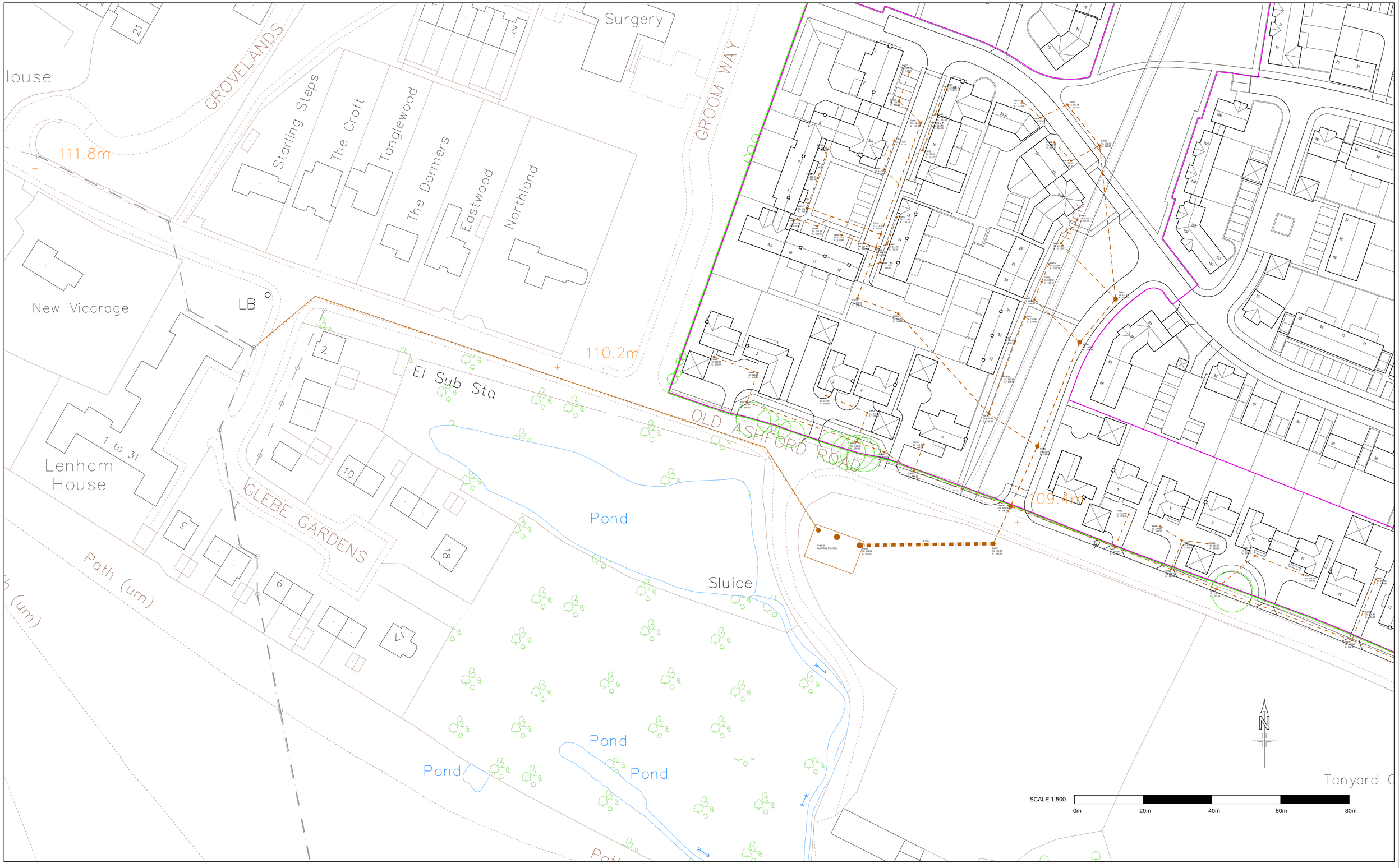
Broadway Chambers, High Street, Crowborough, East Sussex TN6 1DF
Tel: (01892) 601370, Fax: (01892) 601379
E-mail: enquiries@monson.co.uk

Project:
Old Ashford Road
Lenham
Kent

Description:
Foul Water
Drainage Layout
Sheet 1 of 2

Original Drawing:	Prepared	MW	Approved	GL	
Origin:	Crowborough		Size	A1	
Current Issue:	Approved	GL	Date	03/10/16	
Drawing Status:	PRELIMINARY				

Scale:	Dwg No:	Issue:
1:500	5960Q /106	A



Notes:
1. THIS DRAWING TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT MONSON DRAWINGS AND SPECIFICATIONS, ANY DISCREPANCIES TO BE REPORTED TO MONSON PRIOR TO ANY FABRICATION OR WORK COMMENCING ON SITE.

2. DO NOT SCALE THIS DRAWING, USE FIGURED DIMENSIONS ONLY.

3. ALL DIMENSIONS IN MILLIMETRES, ALL LEVELS IN METRES.

Issue	By	Date	Amendments
A	MW	03/10/16	Original issue

MONSON
Broadway Chambers, High Street, Crowborough, East Sussex TN6 1DF
Tel: (01892) 601370, Fax: (01892) 601379
E-mail: enquiries@monson.co.uk

Project:
Old Ashford Road
Lenham
Kent

Description:
Foul Water
Drainage Layout
Sheet 2 of 2

Original Drawing:	Prepared	MW	Approved	GL	
Origin: Crowborough			Size	A1	
Current Issue:	Approved	GL	Date	03/10/16	
Drawing Status:	PRELIMINARY				

Scale:	Dwg No:	Issue:
1:500	5960Q /107	A

SCALE 1:500

0m 20m 40m 60m 80m

KEY:

FOUL WATER PIPE

FOUL WATER MANHOLE

INDICATIVE EXISTING SEWER

N

ASHFORD ROAD

OLD ASHFORD ROAD

GROOM WAY

Surgery

TCB (RAC)

Pond

Sluice

Warehouse

Wareho

Lanrig

The Marvel

110.2m

109.4m

109.4m

Notes:

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3. ALL DIMENSIONS IN MILLIMETRES, ALL LEVELS IN METRES.

Issue	By	Date	Amendments
A	MW	17/10/16	Original issue

MONSON

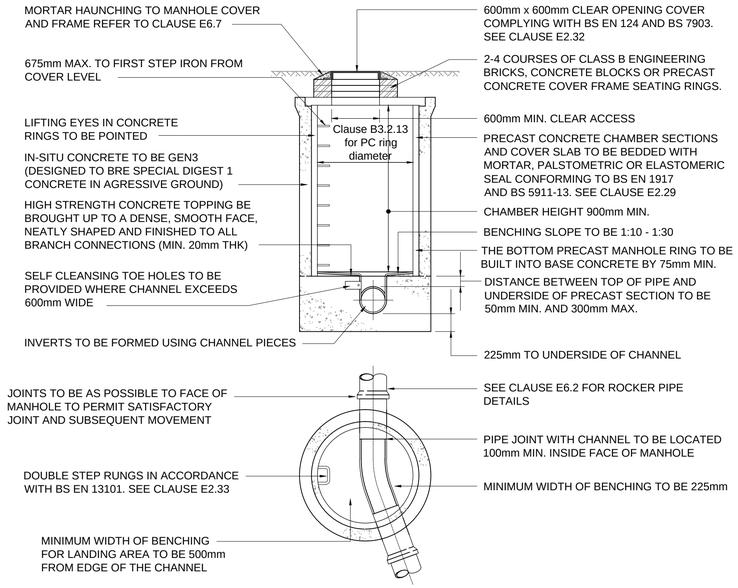
Broadway Chambers, High Street, Crowborough, East Sussex TN6 1DF
Tel: (01892) 601370, Fax: (01892) 601379
E-mail: enquiries@monson.co.uk

Project:
Old Ashford Road
Lenham
Kent

Description:
Preliminary Foul Water Drainage Layout

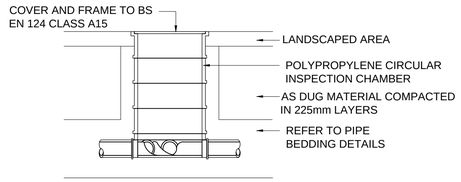
Original Drawing:	Prepared	MW	Approved	GL	
Origin:	Crowborough		Size	A1	
Current Issue:	Approved	GL	Date	17/10/16	
Drawing Status:	PRELIMINARY				

Scale:	Dwg No:	Issue:
1:500	5960Q /108	A



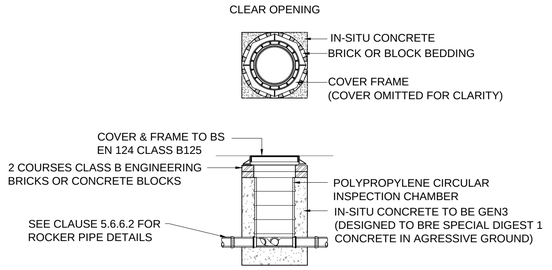
TYPICAL MANHOLE DETAIL - TYPE 2

(MAXIMUM DEPTH FROM COVER LEVEL TO SOFFIT OF PIPE 3.0m)



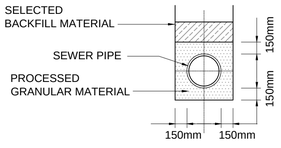
POLYPROPYLENE INSPECTION CHAMBER (PPIC) TYPE 4 (S)

(LOCATED WITHIN PRIVATE AREAS INACCESSIBLE TO MOTOR VEHICLES FOR DEPTHS TO INVERT NOT GREATER THAN 2.00m)

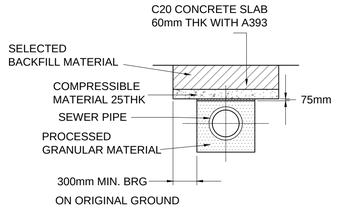


TYPE 4 POLYPROPYLENE INSPECTION CHAMBER. (PPIC)

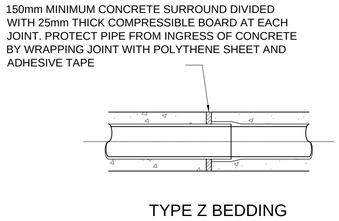
LOCATED WITHIN AREAS ACCESSIBLE TO MOTOR VEHICLES, ROAD OR ACCESS DRIVE, FOR MAX DEPTH 2.00m TO INVERT. TO BE USED WITH APPROVAL OF BUILDING CONTROL OFFICER OR APPROVED INSPECTOR



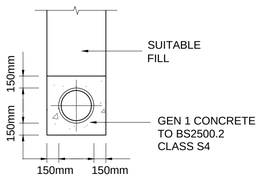
CLASS `S' BEDDING 360° GRANULAR BED AND SURROUND BEDDING FACTOR (FM) 2.2



PIPE PROTECTION LAID AT SHALLOW DEPTHS



TYPE Z BEDDING



NOMINAL SIZE (DN)	PIPE BEDDING REQUIREMENTS (mm)
150	10 OR 14 NOMINAL SINGLE SIZE OR 14 TO 15 GRADED
225 to 525	10, 14 OR 20 NOMINAL SINGLE SIZE OR 14 TO 5 GRADED OR 20 TO 5 GRADED
600 and above	10, 14, 20 OR 40 NOMINAL SIZE CRUSHED ROCK OR 14 TO 5 GRADED OR 20 TO 5 GRADED OR 40 TO 5 GRADED

Notes:
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3. ALL DIMENSIONS IN MILLIMETRES, ALL LEVELS IN METRES.

Fernham HOMES

Issue	By	Date	Amendments
A	MW	17/10/16	Original issue

MONSON
Broadway Chambers, High Street, Crowborough, East Sussex TN6 1DF
Tel: (01892) 601370, Fax: (01892) 601379
E-mail: enquiries@monson.co.uk

Project: Old Ashford Road, Lenham, Kent

Description: Preliminary Foul Water Drainage Standard Details

Original Drawing: Prepared MW Approved GL
Origin: Crowborough Size A1
Current Issue: Approved GL Date 17/10/16
Drawing Status: PRELIMINARY

Scale: 1:500
Dwg No: 5960Q /109
Issue: A

ISSUE SHEET
MEL 64 APPROVED DEC 2012 ISSUE No. 6

Appendix G – Groundwater Source Protection Zones

Environment Agency

Enter a postcode or place name: Go

Other topics for this area... Groundwater

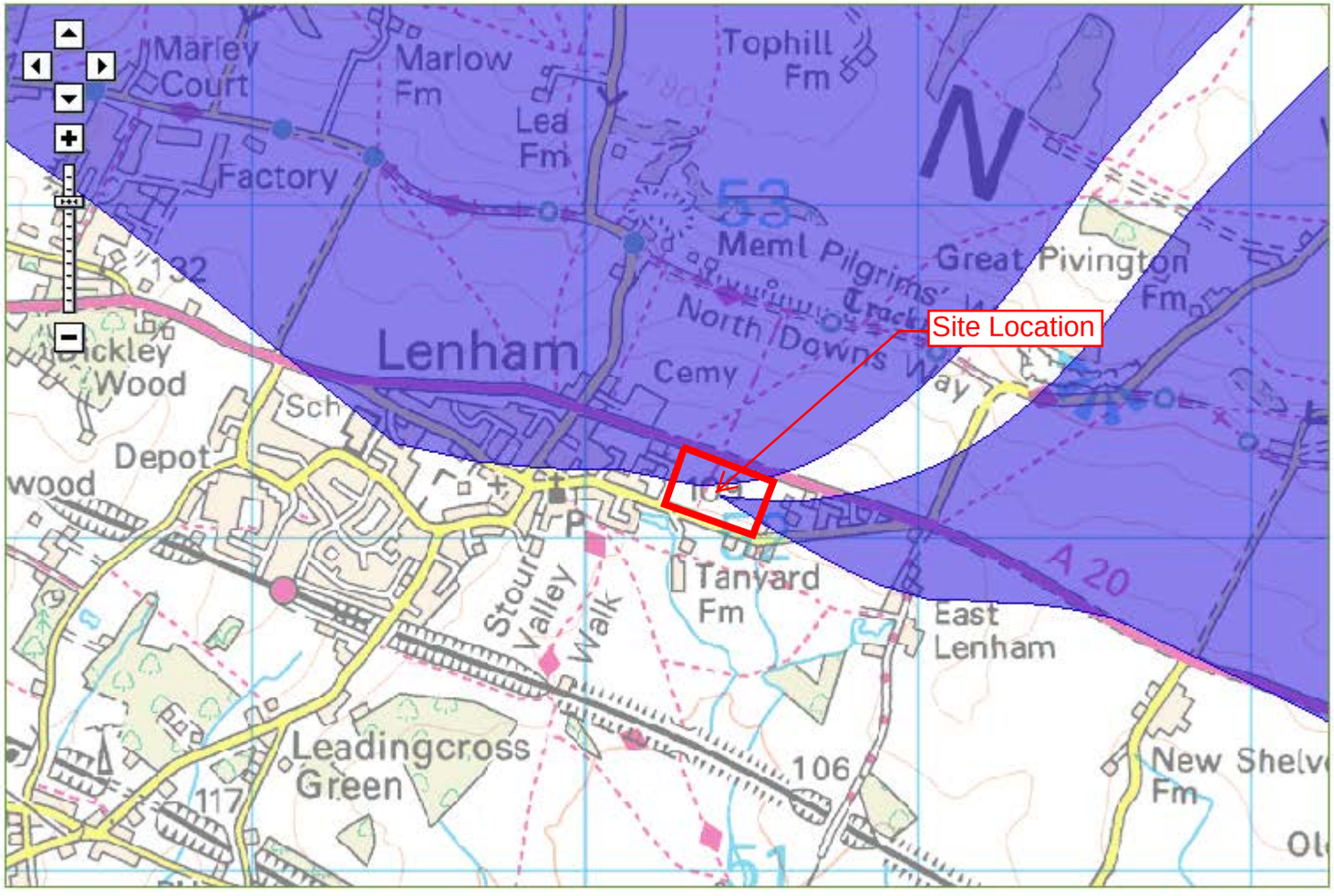
Groundwater

X: 590,250;Y: 152,271 at scale 1:20,000

Other maps | Data search | Text only version

Map legend

- Groundwater source protection zones
  - Inner zone (Zone 1)
  - Inner zone - subsurface activity only (Zone 1c)
  - Outer zone (Zone 2)
  - Outer zone - subsurface activity only (Zone 2c)
  - Total catchment (Zone 3)
  - Total catchment - subsurface activity only (Zone 3c)
  - Special interest (Zone 4)
- BGS Aquifer Maps - Superficial Deposits Designation
  - Principal
  - Secondary A
  - Secondary B
  - Secondary (undifferentiated)
  - Unknown (lakes and landslip)
- BGS Aquifer Maps - Bedrock Designation
  - Principal
  - Secondary A
  - Secondary B
  - Secondary (undifferentiated)
- Groundwater Vulnerability Zones



More about Groundwater

Groundwater Source Protection Zones:

Groundwater provides a third of our drinking water. We ensure that your water is safe to drink defining Source Protection Zones. These zones help to monitor the risk of contamination from any activities that might cause pollution in the area.

Appendix H – Initial consultation

Michal Wojcieszak

From: Lloyd, Jamie <jamie.lloyd@environment-agency.gov.uk>
Sent: 08 July 2016 10:27
To: Michal Wojcieszak
Cc: Lowden, Tommy
Subject: RE: Land North of Old Ashford Road, Lenham, Kent - deep bore soakaway

Hi Michal

Please see the response below from my colleague, Tommy Lowden, in our area Groundwater & Contaminated Land team.

"This site is underlain by Chalk, but is in close proximity to the boundary between the Chalk and the Gault Clay Formation. This boundary causes groundwater to discharge as springs to the southwest and southeast of the site. Single points of infiltration such as deep borehole soakaways could have an impact on the flow and quality of these springs. Therefore, before agreeing to deep borehole soakaways through planning, we would require appropriate assessments to demonstrate this would not be the case. Further we would expect reasons to be provided as to why more shallow solutions would not be feasible for disposal of surface water drainage.

Generic Advice on Infiltration
The following points should be noted wherever infiltration drainage (such as soakaways) is proposed at a site:

- Appropriate pollution prevention methods (such as trapped gullies or interceptors) should be used to prevent hydrocarbons draining to ground from roads, hardstandings and car parks. Clean uncontaminated roof water should drain directly to the system entering after any pollution prevention methods.

- No infiltration system should be sited in or allowed to discharge into made ground, land impacted by contamination or land previously identified as being contaminated.

- **There must be no direct discharge to groundwater**, a controlled water. An unsaturated zone must be maintained throughout the year between the base of the system and the water table.
  A series of shallow systems are preferable to systems such as deep bored soakaways, as deep bored soakaways can act as conduits for rapid transport of contaminants to groundwater.

Any design must adhere to the points above and approval would be subject to the findings of contamination reports and an appropriate drainage design.

Where the enquirer would like detailed comments on a drainage strategy prior to a formal consultation through the planning process, this would be classed as pre-application advice which is a chargeable service. Please contact our Sustainable Places Team at kslplanning@environment-agency.gov.uk for details of this service."

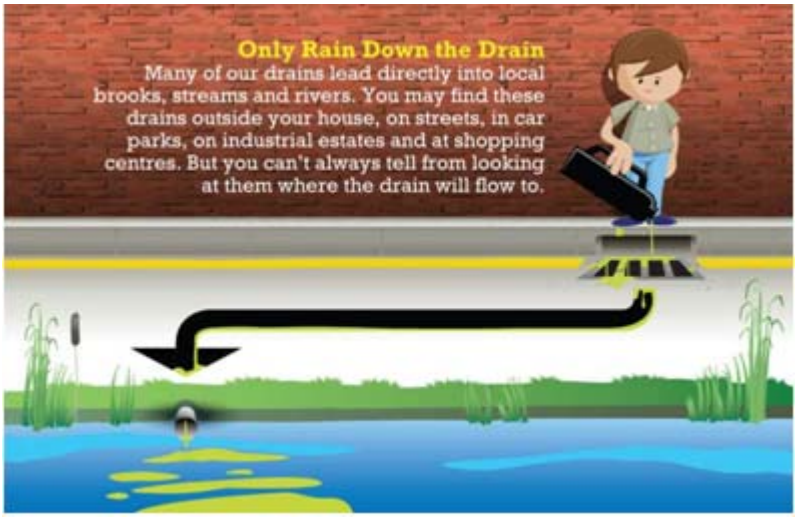
I hope the above helps you with your initial design. It's likely that the EA will be consulted during the planning phase but if you wish further detailed advice please contact the email address above for our chargeable pre-application service.

Regards

Jamie Lloyd
Senior Environment Officer
EPR Land & Water – South London / East Kent
Kent & South London
Telephone – 0208 474 6185

www.gov.uk/environment-agency.

please consider the environment - do you really need to print this email?



From: Michal Wojcieszak [mailto:MWojcieszak@monson.co.uk]
Sent: 30 June 2016 12:18
To: Lloyd, Jamie
Subject: Land North of Old Ashford Road, Lenham, Kent - deep bore soakaway

Dear Jamie,

Thank you for the respond in relation to the proposed development at Croft Road, Westerham.

We just started a new project at land North of Old Ashford Road, Lenham, Kent ME17 2DL. Grid Co-ordinates: TQ 90388 52123

Could we propose the deep bore soakaway as a method of disposing the runoff from access roads and roofs at this location.

Please see the attached site layout and site location plan.

I hope that the information provided illustrates the proposal for you and I look forward to hearing from you in due course, however if you have any queries, please do not hesitate to contact me on 01892 601370.

Kind regards
Michal Wojcieszak

Michal Wojcieszak
For Monson Engineering Ltd

,,,
Tel:01892 601370
Fax:
Email:MWojcieszak@monson.co.uk

Appendix I – MicroDrainage Calculations

STORM SEWER DESIGN by the Modified Rational Method

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)
1.000	14.700	0.150	98.0	0.004	5.00	0.0	0.600	o	100
1.001	9.490	0.100	94.9	0.005	0.00	0.0	0.600	o	100
2.000	4.910	0.150	32.7	0.005	5.00	0.0	0.600	o	100
2.001	3.410	0.100	34.1	0.000	0.00	0.0	0.600	o	100
1.002	2.410	0.170	14.2	0.000	0.00	0.0	0.600	o	100
3.000	19.080	0.200	95.4	0.005	5.00	0.0	0.600	o	100
3.001	15.000	0.140	107.1	0.005	0.00	0.0	0.600	o	100
3.002	4.500	0.060	75.0	0.004	0.00	0.0	0.600	o	100
3.003	1.180	0.020	59.0	0.000	0.00	0.0	0.600	o	100
1.003	1.000	0.010	100.0	0.000	0.00	0.0	0.600	o	100

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)
1.000	50.00	5.32	109.500	0.004	0.0	0.0	0.2	0.78	6.1	0.7
1.001	50.00	5.52	109.350	0.009	0.0	0.0	0.4	0.79	6.2	1.6
2.000	50.00	5.06	109.500	0.005	0.0	0.0	0.2	1.35	10.6	0.9
2.001	50.00	5.10	109.350	0.005	0.0	0.0	0.2	1.33	10.4	0.9
1.002	50.00	5.54	109.250	0.014	0.0	0.0	0.6	2.06	16.2	2.5
3.000	50.00	5.40	109.500	0.005	0.0	0.0	0.2	0.79	6.2	0.9
3.001	50.00	5.74	109.300	0.010	0.0	0.0	0.4	0.74	5.8	1.8
3.002	50.00	5.82	109.160	0.014	0.0	0.0	0.6	0.89	7.0	2.5
3.003	50.00	5.84	109.100	0.014	0.0	0.0	0.6	1.00	7.9	2.5
1.003	50.00	5.87	109.080	0.028	0.0	0.0	1.1	0.77	6.0	4.9

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.840	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	30.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
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	0	Number of Time/Area Diagrams	0
Number of Offline Controls	0		

Simulation Criteria for Storm

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)	20.000	Storm Duration (mins)	30
Ratio R	0.388		

Storage Structures for Storm

Cellular Storage Manhole: 10, DS/PN: 1.003

Invert Level (m) 109.080 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00792 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00792

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	30.0	30.0	0.401	0.0	40.4
0.400	30.0	40.4			

Summary of Results for 30 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 75.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	109.538	-0.062	0.000	0.31		1.8	OK
1.001	2	109.413	-0.037	0.000	0.71		4.1	OK
2.000	3	109.533	-0.067	0.000	0.24		2.2	OK
2.001	4	109.385	-0.065	0.000	0.26		2.2	OK
1.002	5	109.303	-0.047	0.000	0.55		6.3	OK
3.000	6	109.542	-0.058	0.000	0.38		2.2	OK
3.001	7	109.394	-0.006	0.000	0.78		4.3	OK
3.002	8	109.315	0.055	0.000	0.98		5.9	SURCHARGED
3.003	9	109.265	0.065	0.000	1.49		5.9	SURCHARGED
1.003	10	109.237	0.057	0.000	1.89		7.5	SURCHARGED

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.840	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	30.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
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	0	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)	20.000	Storm Duration (mins)	120
Ratio R	0.388		

Summary of Results for 120 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 75.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	109.524	-0.076	0.000	0.13		0.7	OK
1.001	2	109.387	-0.063	0.000	0.29		1.7	OK
2.000	3	109.521	-0.079	0.000	0.10		0.9	OK
2.001	4	109.372	-0.078	0.000	0.11		0.9	OK
1.002	5	109.282	-0.068	0.000	0.23		2.6	OK
3.000	6	109.526	-0.074	0.000	0.16		0.9	OK
3.001	7	109.340	-0.060	0.000	0.33		1.8	OK
3.002	8	109.206	-0.054	0.000	0.43		2.6	OK
3.003	9	109.189	-0.011	0.000	0.65		2.6	OK
1.003	10	109.185	0.005	0.000	1.00		4.0	SURCHARGED

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.840	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	30.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
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	0	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)	20.000	Storm Duration (mins)	60
Ratio R	0.388		

Summary of Results for 60 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 75.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	109.531	-0.069	0.000	0.20		1.2	OK
1.001	2	109.398	-0.052	0.000	0.47		2.7	OK
2.000	3	109.527	-0.073	0.000	0.16		1.5	OK
2.001	4	109.378	-0.072	0.000	0.17		1.5	OK
1.002	5	109.292	-0.058	0.000	0.36		4.1	OK
3.000	6	109.534	-0.066	0.000	0.25		1.5	OK
3.001	7	109.353	-0.047	0.000	0.54		3.0	OK
3.002	8	109.255	-0.005	0.000	0.68		4.1	OK
3.003	9	109.228	0.028	0.000	1.03		4.1	SURCHARGED
1.003	10	109.216	0.036	0.000	1.60		6.3	SURCHARGED

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.840	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	30.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
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	1
Number of Online Controls	0	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)	20.000	Storm Duration (mins)	240
Ratio R	0.388		

Summary of Results for 240 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 75.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	109.518	-0.082	0.000	0.08		0.4	OK
1.001	2	109.378	-0.072	0.000	0.17		1.0	OK
2.000	3	109.516	-0.084	0.000	0.06		0.6	OK
2.001	4	109.366	-0.084	0.000	0.06		0.6	OK
1.002	5	109.274	-0.076	0.000	0.13		1.5	OK
3.000	6	109.520	-0.080	0.000	0.09		0.6	OK
3.001	7	109.330	-0.070	0.000	0.20		1.1	OK
3.002	8	109.194	-0.066	0.000	0.26		1.5	OK
3.003	9	109.147	-0.053	0.000	0.39		1.5	OK
1.003	10	109.145	-0.035	0.000	0.75		2.9	OK

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.840	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	30.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
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	1
Number of Online Controls	0	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)	20.000	Storm Duration (mins)	360
Ratio R	0.388		

Summary of Results for 360 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 75.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	109.515	-0.085	0.000	0.06		0.3	OK
1.001	2	109.373	-0.077	0.000	0.13		0.7	OK
2.000	3	109.513	-0.087	0.000	0.04		0.4	OK
2.001	4	109.364	-0.086	0.000	0.05		0.4	OK
1.002	5	109.271	-0.079	0.000	0.10		1.1	OK
3.000	6	109.517	-0.083	0.000	0.07		0.4	OK
3.001	7	109.325	-0.075	0.000	0.14		0.8	OK
3.002	8	109.189	-0.071	0.000	0.19		1.1	OK
3.003	9	109.137	-0.063	0.000	0.29		1.1	OK
1.003	10	109.133	-0.047	0.000	0.55		2.2	OK

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.840	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	30.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
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	1
Number of Online Controls	0	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)	20.000	Storm Duration (mins)	600
Ratio R	0.388		

Summary of Results for 600 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 75.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	109.512	-0.088	0.000	0.04		0.2	OK
1.001	2	109.369	-0.081	0.000	0.08		0.5	OK
2.000	3	109.511	-0.089	0.000	0.03		0.3	OK
2.001	4	109.361	-0.089	0.000	0.03		0.3	OK
1.002	5	109.267	-0.083	0.000	0.07		0.8	OK
3.000	6	109.514	-0.086	0.000	0.05		0.3	OK
3.001	7	109.321	-0.079	0.000	0.10		0.5	OK
3.002	8	109.183	-0.077	0.000	0.13		0.8	OK
3.003	9	109.129	-0.071	0.000	0.19		0.8	OK
1.003	10	109.122	-0.058	0.000	0.37		1.5	OK

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes Lanc.mh

FSR Rainfall Model - England and Wales

Return Period (years)	1	Add Flow / Climate Change (%)	30
M5-60 (mm)	20.000	Minimum Backdrop Height (m)	0.200
Ratio R	0.394	Maximum Backdrop Height (m)	1.500
Maximum Rainfall (mm/hr)	50	Min Design Depth for Optimisation (m)	1.200
Maximum Time of Concentration (mins)	30	Min Vel for Auto Design only (m/s)	1.00
Foul Sewage (l/s/ha)	0.000	Min Slope for Optimisation (1:X)	500
Volumetric Runoff Coeff.	0.750		

Designed with Level Soffits

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)
1.000	9.680	0.100	96.8	0.004	5.00	0.0	0.600	o	100
1.001	13.480	0.350	38.5	0.009	0.00	0.0	0.600	o	100
1.002	3.920	0.050	78.4	0.000	0.00	0.0	0.600	o	100
2.000	9.000	0.100	90.0	0.005	5.00	0.0	0.600	o	100
2.001	12.560	0.150	83.7	0.005	0.00	0.0	0.600	o	100
2.002	11.560	0.200	57.8	0.005	0.00	0.0	0.600	o	100
2.003	4.000	0.050	80.0	0.000	0.00	0.0	0.600	o	100
1.003	2.000	0.020	100.0	0.000	0.00	0.0	0.600	o	100

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)
1.000	50.00	5.21	109.700	0.004	0.0	0.0	0.2	0.78	6.1	0.7
1.001	50.00	5.39	109.600	0.013	0.0	0.0	0.5	1.25	9.8	2.3
1.002	50.00	5.46	109.250	0.013	0.0	0.0	0.5	0.87	6.8	2.3
2.000	50.00	5.18	109.700	0.005	0.0	0.0	0.2	0.81	6.4	0.9
2.001	50.00	5.43	109.600	0.010	0.0	0.0	0.4	0.84	6.6	1.8
2.002	50.00	5.62	109.450	0.015	0.0	0.0	0.6	1.02	8.0	2.6
2.003	50.00	5.70	109.250	0.015	0.0	0.0	0.6	0.86	6.8	2.6
1.003	50.00	5.74	109.200	0.028	0.0	0.0	1.1	0.77	6.0	4.9

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.840	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	30.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
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	0	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)	20.000	Storm Duration (mins)	30
Ratio R	0.394		

Summary of Results for 30 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 75.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	109.738	-0.062	0.000	0.32		1.8	OK
1.001	2	109.659	-0.041	0.000	0.64		5.9	OK
1.002	3	109.350	0.000	0.000	1.02		5.9	SURCHARGED
2.000	4	109.743	-0.057	0.000	0.38		2.3	OK
2.001	5	109.664	-0.036	0.000	0.73		4.5	OK
2.002	6	109.532	-0.018	0.000	0.91		6.8	OK
2.003	7	109.365	0.015	0.000	1.18		6.8	SURCHARGED
1.003	8	109.306	0.006	0.000	1.25		4.9	SURCHARGED

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.840	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	30.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
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	0	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)	20.000	Storm Duration (mins)	60
Ratio R	0.394		

Summary of Results for 60 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 75.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	109.731	-0.069	0.000	0.21		1.2	OK
1.001	2	109.645	-0.055	0.000	0.42		3.9	OK
1.002	3	109.313	-0.037	0.000	0.67		3.9	OK
2.000	4	109.734	-0.066	0.000	0.25		1.5	OK
2.001	5	109.649	-0.051	0.000	0.48		3.0	OK
2.002	6	109.506	-0.044	0.000	0.60		4.5	OK
2.003	7	109.318	-0.032	0.000	0.78		4.5	OK
1.003	8	109.303	0.003	0.000	1.17		4.6	SURCHARGED

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.840	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	30.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
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	0	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)	20.000	Storm Duration (mins)	120
Ratio R	0.394		

Summary of Results for 120 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 75.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	109.724	-0.076	0.000	0.13		0.7	OK
1.001	2	109.634	-0.066	0.000	0.26		2.4	OK
1.002	3	109.295	-0.055	0.000	0.41		2.4	OK
2.000	4	109.726	-0.074	0.000	0.16		0.9	OK
2.001	5	109.637	-0.063	0.000	0.30		1.8	OK
2.002	6	109.492	-0.058	0.000	0.37		2.8	OK
2.003	7	109.299	-0.051	0.000	0.48		2.8	OK
1.003	8	109.282	-0.018	0.000	1.00		3.9	OK

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.840	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	30.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
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	1
Number of Online Controls	0	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)	20.000	Storm Duration (mins)	240
Ratio R	0.394		

Summary of Results for 240 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 75.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	109.718	-0.082	0.000	0.08		0.4	OK
1.001	2	109.626	-0.074	0.000	0.15		1.4	OK
1.002	3	109.284	-0.066	0.000	0.25		1.4	OK
2.000	4	109.720	-0.080	0.000	0.09		0.5	OK
2.001	5	109.628	-0.072	0.000	0.18		1.1	OK
2.002	6	109.482	-0.068	0.000	0.22		1.6	OK
2.003	7	109.286	-0.064	0.000	0.29		1.6	OK
1.003	8	109.261	-0.039	0.000	0.69		2.7	OK

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.840	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	30.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
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	1
Number of Online Controls	0	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)	20.000	Storm Duration (mins)	360
Ratio R	0.394		

Summary of Results for 360 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 75.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	109.715	-0.085	0.000	0.06		0.3	OK
1.001	2	109.622	-0.078	0.000	0.11		1.0	OK
1.002	3	109.278	-0.072	0.000	0.18		1.0	OK
2.000	4	109.717	-0.083	0.000	0.07		0.4	OK
2.001	5	109.624	-0.076	0.000	0.13		0.8	OK
2.002	6	109.477	-0.073	0.000	0.16		1.2	OK
2.003	7	109.281	-0.069	0.000	0.21		1.2	OK
1.003	8	109.251	-0.049	0.000	0.52		2.1	OK

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.840	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	30.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
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	1
Number of Online Controls	0	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)	20.000	Storm Duration (mins)	600
Ratio R	0.394		

Summary of Results for 600 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 75.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	109.712	-0.088	0.000	0.04		0.2	OK
1.001	2	109.618	-0.082	0.000	0.07		0.7	OK
1.002	3	109.273	-0.077	0.000	0.12		0.7	OK
2.000	4	109.714	-0.086	0.000	0.05		0.3	OK
2.001	5	109.620	-0.080	0.000	0.09		0.5	OK
2.002	6	109.472	-0.078	0.000	0.11		0.8	OK
2.003	7	109.275	-0.075	0.000	0.14		0.8	OK
1.003	8	109.241	-0.059	0.000	0.36		1.4	OK

STORM SEWER DESIGN by the Modified Rational Method

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)
1.000	8.490	0.100	84.9	0.005	5.00	0.0	0.600	o	100
1.001	8.490	0.100	84.9	0.005	0.00	0.0	0.600	o	100
1.002	13.890	0.200	69.5	0.000	0.00	0.0	0.600	o	100
2.000	3.250	0.500	6.5	0.006	5.00	0.0	0.600	o	100
1.003	2.000	0.020	100.0	0.000	0.00	0.0	0.600	o	100
1.004	2.000	0.020	100.0	0.000	0.00	0.0	0.600	o	100

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)
1.000	50.00	5.17	109.400	0.005	0.0	0.0	0.2	0.84	6.6	0.9
1.001	50.00	5.34	109.300	0.010	0.0	0.0	0.4	0.84	6.6	1.8
1.002	50.00	5.59	109.200	0.010	0.0	0.0	0.4	0.93	7.3	1.8
2.000	50.00	5.02	109.500	0.006	0.0	0.0	0.2	3.05	24.0	1.1
1.003	50.00	5.63	109.000	0.016	0.0	0.0	0.6	0.77	6.0	2.8
1.004	50.00	5.68	108.980	0.016	0.0	0.0	0.6	0.77	6.0	2.8

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.840	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	30.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
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	0	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)	20.000	Storm Duration (mins)	30
Ratio R	0.394		

Storage Structures for Storm

Cellular Storage Manhole: 6, DS/PN: 1.004

Invert Level (m) 108.980 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00792 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00792

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	32.0	32.0	0.401	0.0	41.6
0.400	32.0	41.6			

Summary of Results for 30 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 75.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	109.442	-0.058	0.000	0.37		2.3	OK
1.001	2	109.366	-0.034	0.000	0.75		4.5	OK
1.002	3	109.260	-0.040	0.000	0.66		4.6	OK
2.000	4	109.525	-0.075	0.000	0.14		2.7	OK
1.003	5	109.143	0.043	0.000	1.85		7.3	SURCHARGED
1.004	6	109.069	-0.011	0.000	1.00		3.9	OK

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.840	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	30.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
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	0	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)	20.000	Storm Duration (mins)	60
Ratio R	0.394		

Summary of Results for 60 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 75.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	109.434	-0.066	0.000	0.25		1.5	OK
1.001	2	109.350	-0.050	0.000	0.49		3.0	OK
1.002	3	109.246	-0.054	0.000	0.43		3.0	OK
2.000	4	109.520	-0.080	0.000	0.09		1.8	OK
1.003	5	109.105	0.005	0.000	1.21		4.8	SURCHARGED
1.004	6	109.057	-0.023	0.000	0.94		3.7	OK

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.840	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	30.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
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	0	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)	20.000	Storm Duration (mins)	120
Ratio R	0.394		

Summary of Results for 120 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 75.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	109.426	-0.074	0.000	0.15		0.9	OK
1.001	2	109.338	-0.062	0.000	0.30		1.8	OK
1.002	3	109.235	-0.065	0.000	0.27		1.8	OK
2.000	4	109.515	-0.085	0.000	0.06		1.1	OK
1.003	5	109.065	-0.035	0.000	0.75		2.9	OK
1.004	6	109.040	-0.040	0.000	0.67		2.6	OK

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.840	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	30.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
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	1
Number of Online Controls	0	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)	20.000	Storm Duration (mins)	240
Ratio R	0.394		

Summary of Results for 240 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 75.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	109.420	-0.080	0.000	0.09		0.6	OK
1.001	2	109.329	-0.071	0.000	0.18		1.1	OK
1.002	3	109.227	-0.073	0.000	0.16		1.1	OK
2.000	4	109.512	-0.088	0.000	0.03		0.7	OK
1.003	5	109.047	-0.053	0.000	0.45		1.8	OK
1.004	6	109.025	-0.055	0.000	0.42		1.7	OK

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.840	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	30.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
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	1
Number of Online Controls	0	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)	20.000	Storm Duration (mins)	360
Ratio R	0.394		

Summary of Results for 360 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 75.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	109.417	-0.083	0.000	0.07		0.4	OK
1.001	2	109.324	-0.076	0.000	0.13		0.8	OK
1.002	3	109.223	-0.077	0.000	0.12		0.8	OK
2.000	4	109.510	-0.090	0.000	0.02		0.5	OK
1.003	5	109.039	-0.061	0.000	0.32		1.3	OK
1.004	6	109.018	-0.062	0.000	0.31		1.2	OK

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.840	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	30.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
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	1
Number of Online Controls	0	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)	20.000	Storm Duration (mins)	600
Ratio R	0.394		

Summary of Results for 600 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 75.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	109.413	-0.087	0.000	0.04		0.3	OK
1.001	2	109.320	-0.080	0.000	0.09		0.5	OK
1.002	3	109.218	-0.082	0.000	0.08		0.5	OK
2.000	4	109.508	-0.092	0.000	0.02		0.3	OK
1.003	5	109.031	-0.069	0.000	0.22		0.9	OK
1.004	6	109.011	-0.069	0.000	0.21		0.8	OK

STORM SEWER DESIGN by the Modified Rational Method

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)
1.000	9.190	0.100	91.9	0.005	5.00	0.0	0.600	o	100
1.001	21.650	0.390	55.5	0.005	0.00	0.0	0.600	o	100
1.002	1.200	0.100	12.0	0.002	0.00	0.0	0.600	o	100
2.000	11.130	0.350	31.8	0.004	5.00	0.0	0.600	o	100
1.003	2.530	0.050	50.6	0.000	0.00	0.0	0.600	o	100
1.004	2.000	0.020	100.0	0.000	0.00	0.0	0.600	o	100

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)
1.000	50.00	5.19	109.690	0.005	0.0	0.0	0.2	0.80	6.3	0.9
1.001	50.00	5.54	109.590	0.010	0.0	0.0	0.4	1.04	8.1	1.8
1.002	50.00	5.55	109.200	0.012	0.0	0.0	0.5	2.24	17.6	2.1
2.000	50.00	5.14	109.450	0.004	0.0	0.0	0.2	1.37	10.8	0.7
1.003	50.00	5.59	109.100	0.016	0.0	0.0	0.6	1.09	8.5	2.8
1.004	50.00	5.63	109.050	0.016	0.0	0.0	0.6	0.77	6.0	2.8

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.840	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	30.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
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	0	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)	20.000	Storm Duration (mins)	30
Ratio R	0.394		

Storage Structures for Storm

Cellular Storage Manhole: 6, DS/PN: 1.004

Invert Level (m) 108.880 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00792 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00792

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	32.0	32.0	0.401	0.0	41.6
0.400	32.0	41.6			

Summary of Results for 30 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 75.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	109.733	-0.057	0.000	0.39		2.3	OK
1.001	2	109.645	-0.045	0.000	0.58		4.5	OK
1.002	3	109.257	-0.043	0.000	0.62		5.5	OK
2.000	4	109.478	-0.072	0.000	0.18		1.8	OK
1.003	5	109.213	0.013	0.000	1.17		7.3	SURCHARGED
1.004	6	109.062	-0.088	0.000	0.03		0.1	OK

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.840	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	30.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
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	0	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)	20.000	Storm Duration (mins)	60
Ratio R	0.394		

Summary of Results for 60 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 75.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	109.724	-0.066	0.000	0.26		1.5	OK
1.001	2	109.633	-0.057	0.000	0.38		3.0	OK
1.002	3	109.245	-0.055	0.000	0.41		3.6	OK
2.000	4	109.473	-0.077	0.000	0.12		1.2	OK
1.003	5	109.166	-0.034	0.000	0.76		4.7	OK
1.004	6	109.081	-0.069	0.000	0.21		0.8	OK

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.840	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	30.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
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	0	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)	20.000	Storm Duration (mins)	120
Ratio R	0.394		

Summary of Results for 120 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 75.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	109.716	-0.074	0.000	0.16		0.9	OK
1.001	2	109.623	-0.067	0.000	0.23		1.8	OK
1.002	3	109.234	-0.066	0.000	0.25		2.2	OK
2.000	4	109.468	-0.082	0.000	0.07		0.7	OK
1.003	5	109.148	-0.052	0.000	0.47		2.9	OK
1.004	6	109.088	-0.062	0.000	0.31		1.2	OK

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.840	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	30.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
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	1
Number of Online Controls	0	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)	20.000	Storm Duration (mins)	240
Ratio R	0.394		

Summary of Results for 240 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 75.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	109.711	-0.079	0.000	0.09		0.5	OK
1.001	2	109.615	-0.075	0.000	0.14		1.1	OK
1.002	3	109.226	-0.074	0.000	0.15		1.3	OK
2.000	4	109.463	-0.087	0.000	0.04		0.4	OK
1.003	5	109.136	-0.064	0.000	0.28		1.8	OK
1.004	6	109.087	-0.063	0.000	0.29		1.1	OK

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.840	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	30.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
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	1
Number of Online Controls	0	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)	20.000	Storm Duration (mins)	360
Ratio R	0.394		

Summary of Results for 360 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 75.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	109.707	-0.083	0.000	0.07		0.4	OK
1.001	2	109.611	-0.079	0.000	0.10		0.8	OK
1.002	3	109.222	-0.078	0.000	0.11		1.0	OK
2.000	4	109.462	-0.088	0.000	0.03		0.3	OK
1.003	5	109.131	-0.069	0.000	0.21		1.3	OK
1.004	6	109.083	-0.067	0.000	0.24		1.0	OK

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.840	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	30.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
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	1
Number of Online Controls	0	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)	20.000	Storm Duration (mins)	600
Ratio R	0.394		

Summary of Results for 600 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 75.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	109.704	-0.086	0.000	0.05		0.3	OK
1.001	2	109.607	-0.083	0.000	0.07		0.5	OK
1.002	3	109.218	-0.082	0.000	0.07		0.6	OK
2.000	4	109.460	-0.090	0.000	0.02		0.2	OK
1.003	5	109.125	-0.075	0.000	0.14		0.9	OK
1.004	6	109.079	-0.071	0.000	0.18		0.7	OK

STORM SEWER DESIGN by the Modified Rational Method

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)
1.000	14.270	0.200	71.4	0.007	5.00	0.0	0.600	o	100
2.000	9.480	0.200	47.4	0.004	5.00	0.0	0.600	o	100
3.000	10.000	0.200	50.0	0.004	5.00	0.0	0.600	o	100
1.001	3.260	0.350	9.3	0.004	0.00	0.0	0.600	o	100
4.000	15.000	0.150	100.0	0.007	5.00	0.0	0.600	o	100
5.000	10.760	0.150	71.7	0.005	5.00	0.0	0.600	o	100
4.001	5.000	0.050	100.0	0.006	0.00	0.0	0.600	o	100
4.002	9.770	0.150	65.1	0.000	0.00	0.0	0.600	o	100
1.002	2.000	0.020	100.0	0.000	0.00	0.0	0.600	o	150

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)
1.000	50.00	5.26	109.450	0.007	0.0	0.0	0.3	0.91	7.2	1.2
2.000	50.00	5.14	109.450	0.004	0.0	0.0	0.2	1.12	8.8	0.7
3.000	50.00	5.15	109.450	0.004	0.0	0.0	0.2	1.09	8.6	0.7
1.001	50.00	5.28	109.250	0.019	0.0	0.0	0.8	2.55	20.0	3.3
4.000	50.00	5.33	109.250	0.007	0.0	0.0	0.3	0.77	6.0	1.2
5.000	50.00	5.20	109.250	0.005	0.0	0.0	0.2	0.91	7.1	0.9
4.001	50.00	5.43	109.100	0.018	0.0	0.0	0.7	0.77	6.0	3.2
4.002	50.00	5.60	109.050	0.018	0.0	0.0	0.7	0.96	7.5	3.2
1.002	50.00	5.64	108.850	0.037	0.0	0.0	1.5	1.00	17.8	6.5

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.840	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	30.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
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	0	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)	20.000	Storm Duration (mins)	30
Ratio R	0.394		

Storage Structures for Storm

Cellular Storage Manhole: 9, DS/PN: 1.002

Invert Level (m) 108.900 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00792 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00792

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	72.0	72.0	0.401	0.0	86.4
0.400	72.0	86.4			

Summary of Results for 30 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 75.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	109.498	-0.052	0.000	0.46		3.2	OK
2.000	2	109.482	-0.068	0.000	0.22		1.8	OK
3.000	3	109.482	-0.068	0.000	0.23		1.8	OK
1.001	4	109.301	-0.049	0.000	0.52		8.6	OK
4.000	5	109.327	-0.023	0.000	0.53		3.0	OK
5.000	6	109.303	-0.047	0.000	0.33		2.2	OK
4.001	7	109.284	0.084	0.000	1.46		7.7	SURCHARGED
4.002	8	109.177	0.027	0.000	1.10		7.7	SURCHARGED
1.002	9	108.965	-0.035	0.000	0.94		10.2	OK

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.840	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	30.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
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	0	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)	20.000	Storm Duration (mins)	60
Ratio R	0.394		

Summary of Results for 60 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 75.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	109.488	-0.062	0.000	0.31		2.1	OK
2.000	2	109.475	-0.075	0.000	0.15		1.2	OK
3.000	3	109.476	-0.074	0.000	0.15		1.2	OK
1.001	4	109.291	-0.059	0.000	0.34		5.7	OK
4.000	5	109.292	-0.058	0.000	0.36		2.1	OK
5.000	6	109.282	-0.068	0.000	0.22		1.5	OK
4.001	7	109.197	-0.003	0.000	1.00		5.3	OK
4.002	8	109.115	-0.035	0.000	0.76		5.3	OK
1.002	9	108.949	-0.051	0.000	0.77		8.4	OK

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.840	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	30.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
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	0	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)	20.000	Storm Duration (mins)	120
Ratio R	0.394		

Summary of Results for 120 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 75.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	109.479	-0.071	0.000	0.19		1.3	OK
2.000	2	109.470	-0.080	0.000	0.09		0.7	OK
3.000	3	109.470	-0.080	0.000	0.09		0.7	OK
1.001	4	109.281	-0.069	0.000	0.21		3.5	OK
4.000	5	109.282	-0.068	0.000	0.22		1.3	OK
5.000	6	109.275	-0.075	0.000	0.14		0.9	OK
4.001	7	109.158	-0.042	0.000	0.63		3.3	OK
4.002	8	109.099	-0.051	0.000	0.47		3.3	OK
1.002	9	108.930	-0.070	0.000	0.55		6.0	OK

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.840	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	30.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
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	1
Number of Online Controls	0	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)	20.000	Storm Duration (mins)	240
Ratio R	0.394		

Summary of Results for 240 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 75.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	109.472	-0.078	0.000	0.11		0.8	OK
2.000	2	109.465	-0.085	0.000	0.05		0.4	OK
3.000	3	109.465	-0.085	0.000	0.06		0.4	OK
1.001	4	109.274	-0.076	0.000	0.13		2.1	OK
4.000	5	109.274	-0.076	0.000	0.13		0.8	OK
5.000	6	109.269	-0.081	0.000	0.08		0.5	OK
4.001	7	109.142	-0.058	0.000	0.37		2.0	OK
4.002	8	109.086	-0.064	0.000	0.28		2.0	OK
1.002	9	108.911	-0.089	0.000	0.35		3.8	OK

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.840	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	30.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
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	1
Number of Online Controls	0	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)	20.000	Storm Duration (mins)	360
Ratio R	0.394		

Summary of Results for 360 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 75.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	109.469	-0.081	0.000	0.08		0.6	OK
2.000	2	109.463	-0.087	0.000	0.04		0.3	OK
3.000	3	109.463	-0.087	0.000	0.04		0.3	OK
1.001	4	109.270	-0.080	0.000	0.09		1.5	OK
4.000	5	109.271	-0.079	0.000	0.10		0.6	OK
5.000	6	109.266	-0.084	0.000	0.06		0.4	OK
4.001	7	109.135	-0.065	0.000	0.27		1.4	OK
4.002	8	109.081	-0.069	0.000	0.21		1.4	OK
1.002	9	108.902	-0.098	0.000	0.27		2.9	OK

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.840	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	30.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
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	1
Number of Online Controls	0	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)	20.000	Storm Duration (mins)	600
Ratio R	0.394		

Summary of Results for 600 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 75.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	109.465	-0.085	0.000	0.05		0.4	OK
2.000	2	109.461	-0.089	0.000	0.03		0.2	OK
3.000	3	109.461	-0.089	0.000	0.03		0.2	OK
1.001	4	109.266	-0.084	0.000	0.06		1.0	OK
4.000	5	109.267	-0.083	0.000	0.07		0.4	OK
5.000	6	109.263	-0.087	0.000	0.04		0.3	OK
4.001	7	109.129	-0.071	0.000	0.18		1.0	OK
4.002	8	109.075	-0.075	0.000	0.14		1.0	OK
1.002	9	108.893	-0.107	0.000	0.18		2.0	OK

STORM SEWER DESIGN by the Modified Rational Method

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)
1.000	11.720	0.120	97.7	0.002	5.00	0.0	0.600	o	100
1.001	2.000	0.020	100.0	0.003	0.00	0.0	0.600	o	100
1.002	13.000	0.130	100.0	0.002	0.00	0.0	0.600	o	100
1.003	14.530	0.200	72.7	0.005	0.00	0.0	0.600	o	100
1.004	7.100	0.080	88.8	0.003	0.00	0.0	0.600	o	100
2.000	11.000	0.200	55.0	0.003	5.00	0.0	0.600	o	100
2.001	10.430	0.250	41.7	0.004	0.00	0.0	0.600	o	100
1.005	3.300	0.040	82.5	0.000	0.00	0.0	0.600	o	100
1.006	2.000	0.020	100.0	0.000	0.00	0.0	0.600	o	100

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)
1.000	50.00	5.25	109.100	0.002	0.0	0.0	0.1	0.78	6.1	0.4
1.001	50.00	5.29	108.980	0.005	0.0	0.0	0.2	0.77	6.0	0.9
1.002	50.00	5.58	108.960	0.007	0.0	0.0	0.3	0.77	6.0	1.2
1.003	50.00	5.84	108.830	0.012	0.0	0.0	0.5	0.90	7.1	2.1
1.004	50.00	5.99	108.630	0.015	0.0	0.0	0.6	0.82	6.4	2.6
2.000	50.00	5.18	109.000	0.003	0.0	0.0	0.1	1.04	8.2	0.5
2.001	50.00	5.32	108.800	0.007	0.0	0.0	0.3	1.20	9.4	1.2
1.005	49.80	6.05	108.550	0.022	0.0	0.0	0.9	0.85	6.7	3.9
1.006	49.63	6.10	108.510	0.022	0.0	0.0	0.9	0.77	6.0	3.9

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.840	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	30.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
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	0	Number of Time/Area Diagrams	0
Number of Offline Controls	0		

Synthetic Rainfall Details

Rainfall Model	FSR	M5-60 (mm)	20.000
Return Period (years)	100	Ratio R	0.394
Region	England and Wales	Profile Type	Winter

Synthetic Rainfall Details

Cv (Summer) 0.750 Storm Duration (mins) 30
Cv (Winter) 0.840

Storage Structures for Storm

Cellular Storage Manhole: 9, DS/PN: 1.006

Invert Level (m) 108.510 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00792 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00792

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	42.0	42.0	0.401	0.0	52.4
0.400	42.0	52.4			

Summary of Results for 30 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 75.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	109.126	-0.074	0.000	0.16		0.9	OK
1.001	2	109.035	-0.045	0.000	0.58		2.3	OK
1.002	3	109.014	-0.046	0.000	0.56		3.2	OK
1.003	4	108.954	0.024	0.000	0.78		5.3	SURCHARGED
1.004	5	108.831	0.101	0.000	1.13		6.6	SURCHARGED
2.000	6	109.028	-0.072	0.000	0.18		1.4	OK
2.001	7	108.842	-0.058	0.000	0.36		3.2	OK
1.005	8	108.729	0.079	0.000	1.75		9.6	SURCHARGED
1.006	9	108.616	0.006	0.000	1.24		4.9	SURCHARGED

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.840	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	30.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
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	0	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)	20.000	Storm Duration (mins)	60
Ratio R	0.394		

Summary of Results for 60 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 75.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	109.121	-0.079	0.000	0.10		0.6	OK
1.001	2	109.023	-0.057	0.000	0.38		1.5	OK
1.002	3	109.002	-0.058	0.000	0.37		2.1	OK
1.003	4	108.882	-0.048	0.000	0.53		3.6	OK
1.004	5	108.712	-0.018	0.000	0.77		4.5	OK
2.000	6	109.023	-0.077	0.000	0.12		0.9	OK
2.001	7	108.833	-0.067	0.000	0.24		2.1	OK
1.005	8	108.663	0.013	0.000	1.20		6.6	SURCHARGED
1.006	9	108.606	-0.004	0.000	1.00		3.9	OK

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.840	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	30.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
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	0	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)	20.000	Storm Duration (mins)	120
Ratio R	0.394		

Summary of Results for 120 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 75.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	109.116	-0.084	0.000	0.06		0.4	OK
1.001	2	109.013	-0.067	0.000	0.23		0.9	OK
1.002	3	108.992	-0.068	0.000	0.23		1.3	OK
1.003	4	108.869	-0.061	0.000	0.33		2.2	OK
1.004	5	108.678	-0.052	0.000	0.47		2.8	OK
2.000	6	109.018	-0.082	0.000	0.07		0.6	OK
2.001	7	108.825	-0.075	0.000	0.15		1.3	OK
1.005	8	108.614	-0.036	0.000	0.74		4.0	OK
1.006	9	108.583	-0.027	0.000	0.88		3.5	OK

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.840	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	30.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
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	1
Number of Online Controls	0	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)	20.000	Storm Duration (mins)	240
Ratio R	0.394		

Summary of Results for 240 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 75.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	109.113	-0.087	0.000	0.04		0.2	OK
1.001	2	109.005	-0.075	0.000	0.14		0.5	OK
1.002	3	108.984	-0.076	0.000	0.13		0.8	OK
1.003	4	108.860	-0.070	0.000	0.20		1.3	OK
1.004	5	108.666	-0.064	0.000	0.28		1.6	OK
2.000	6	109.013	-0.087	0.000	0.04		0.3	OK
2.001	7	108.820	-0.080	0.000	0.09		0.8	OK
1.005	8	108.596	-0.054	0.000	0.44		2.4	OK
1.006	9	108.564	-0.046	0.000	0.57		2.2	OK

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.840	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	30.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
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	1
Number of Online Controls	0	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)	20.000	Storm Duration (mins)	360
Ratio R	0.394		

Summary of Results for 360 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 75.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	109.111	-0.089	0.000	0.03		0.2	OK
1.001	2	109.001	-0.079	0.000	0.10		0.4	OK
1.002	3	108.981	-0.079	0.000	0.10		0.6	OK
1.003	4	108.855	-0.075	0.000	0.14		1.0	OK
1.004	5	108.661	-0.069	0.000	0.21		1.2	OK
2.000	6	109.012	-0.088	0.000	0.03		0.2	OK
2.001	7	108.816	-0.084	0.000	0.06		0.6	OK
1.005	8	108.589	-0.061	0.000	0.32		1.8	OK
1.006	9	108.555	-0.055	0.000	0.42		1.7	OK

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.840	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	30.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
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	1
Number of Online Controls	0	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)	20.000	Storm Duration (mins)	600
Ratio R	0.394		

Summary of Results for 600 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 75.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	109.109	-0.091	0.000	0.02		0.1	OK
1.001	2	108.997	-0.083	0.000	0.07		0.3	OK
1.002	3	108.977	-0.083	0.000	0.07		0.4	OK
1.003	4	108.851	-0.079	0.000	0.10		0.6	OK
1.004	5	108.655	-0.075	0.000	0.14		0.8	OK
2.000	6	109.010	-0.090	0.000	0.02		0.2	OK
2.001	7	108.813	-0.087	0.000	0.04		0.4	OK
1.005	8	108.581	-0.069	0.000	0.21		1.2	OK
1.006	9	108.546	-0.064	0.000	0.29		1.1	OK

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes Lanc.mh

FSR Rainfall Model - England and Wales

Return Period (years)	1	Add Flow / Climate Change (%)	30
M5-60 (mm)	20.000	Minimum Backdrop Height (m)	0.200
Ratio R	0.394	Maximum Backdrop Height (m)	1.500
Maximum Rainfall (mm/hr)	50	Min Design Depth for Optimisation (m)	1.200
Maximum Time of Concentration (mins)	30	Min Vel for Auto Design only (m/s)	1.00
Foul Sewage (l/s/ha)	0.000	Min Slope for Optimisation (1:X)	500
Volumetric Runoff Coeff.	0.750		

Designed with Level Soffits

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)
1.000	20.000	0.200	100.0	0.005	5.00	0.0	0.600	o	100
2.000	10.000	0.100	100.0	0.005	5.00	0.0	0.600	o	100
1.001	16.350	0.160	102.2	0.005	0.00	0.0	0.600	o	100
3.000	12.380	0.160	77.4	0.003	5.00	0.0	0.600	o	100
1.002	2.000	0.020	100.0	0.002	0.00	0.0	0.600	o	100
4.000	11.670	0.120	97.3	0.005	5.00	0.0	0.600	o	100
4.001	5.000	0.060	83.3	0.005	0.00	0.0	0.600	o	100

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)
1.000	50.00	5.43	109.200	0.005	0.0	0.0	0.2	0.77	6.0	0.9
2.000	50.00	5.22	109.100	0.005	0.0	0.0	0.2	0.77	6.0	0.9
1.001	50.00	5.79	109.000	0.015	0.0	0.0	0.6	0.76	6.0	2.6
3.000	50.00	5.24	109.000	0.003	0.0	0.0	0.1	0.88	6.9	0.5
1.002	50.00	5.84	108.840	0.020	0.0	0.0	0.8	0.77	6.0	3.5
4.000	50.00	5.25	109.000	0.005	0.0	0.0	0.2	0.78	6.1	0.9
4.001	50.00	5.35	108.880	0.010	0.0	0.0	0.4	0.84	6.6	1.8

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)
1.003	1.930	0.020	96.5	0.000	0.00	0.0	0.600	o	100
1.004	1.600	0.050	32.0	0.000	0.00	0.0	0.600	o	100
1.005	2.000	0.020	100.0	0.000	0.00	0.0	0.600	o	100

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)
1.003	50.00	5.88	108.820	0.030	0.0	0.0	1.2	0.78	6.1	5.3
1.004	50.00	5.90	108.800	0.030	0.0	0.0	1.2	1.37	10.7	5.3
1.005	50.00	5.94	108.750	0.030	0.0	0.0	1.2	0.77	6.0	5.3

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.840	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	30.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
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	0	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)	20.000	Storm Duration (mins)	30
Ratio R	0.394		

Storage Structures for Storm

Cellular Storage Manhole: 10, DS/PN: 1.005

Invert Level (m) 108.750 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00792 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00792

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	36.3	36.3	0.801	0.0	63.5
0.800	36.3	63.5			

Summary of Results for 30 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 75.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	109.444	0.144	0.000	0.34		2.0	SURCHARGED
2.000	2	109.438	0.238	0.000	0.34		1.9	SURCHARGED
1.001	3	109.423	0.323	0.000	0.99		5.6	SURCHARGED
3.000	4	109.275	0.175	0.000	0.18		1.2	SURCHARGED
1.002	5	109.265	0.325	0.000	1.91		7.5	SURCHARGED
4.000	6	109.237	0.137	0.000	0.35		2.0	SURCHARGED
4.001	7	109.219	0.239	0.000	0.70		4.0	SURCHARGED
1.003	8	109.191	0.271	0.000	2.88		11.3	SURCHARGED
1.004	9	109.029	0.129	0.000	1.82		11.3	SURCHARGED
1.005	10	108.891	0.041	0.000	1.82		7.2	SURCHARGED

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.840	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	30.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
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	0	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)	20.000	Storm Duration (mins)	60
Ratio R	0.394		

Summary of Results for 60 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 75.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	109.234	-0.066	0.000	0.25		1.5	OK
2.000	2	109.171	-0.029	0.000	0.26		1.4	OK
1.001	3	109.159	0.059	0.000	0.72		4.1	SURCHARGED
3.000	4	109.083	-0.017	0.000	0.13		0.8	OK
1.002	5	109.075	0.135	0.000	1.39		5.5	SURCHARGED
4.000	6	109.064	-0.036	0.000	0.25		1.5	OK
4.001	7	109.052	0.072	0.000	0.48		2.8	SURCHARGED
1.003	8	109.038	0.118	0.000	2.08		8.2	SURCHARGED
1.004	9	108.954	0.054	0.000	1.31		8.2	SURCHARGED
1.005	10	108.879	0.029	0.000	1.65		6.5	SURCHARGED

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.840	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	30.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
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	0	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)	20.000	Storm Duration (mins)	120
Ratio R	0.394		

Summary of Results for 120 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 75.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	109.226	-0.074	0.000	0.16		0.9	OK
2.000	2	109.127	-0.073	0.000	0.16		0.9	OK
1.001	3	109.049	-0.051	0.000	0.48		2.8	OK
3.000	4	109.020	-0.080	0.000	0.09		0.6	OK
1.002	5	108.948	0.008	0.000	0.94		3.7	SURCHARGED
4.000	6	109.027	-0.073	0.000	0.16		0.9	OK
4.001	7	108.944	-0.036	0.000	0.33		1.9	OK
1.003	8	108.939	0.019	0.000	1.44		5.7	SURCHARGED
1.004	9	108.887	-0.013	0.000	0.91		5.6	OK
1.005	10	108.854	0.004	0.000	1.20		4.7	SURCHARGED

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.840	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	30.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
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	1
Number of Online Controls	0	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)	20.000	Storm Duration (mins)	240
Ratio R	0.394		

Summary of Results for 240 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 75.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	109.221	-0.079	0.000	0.09		0.5	OK
2.000	2	109.121	-0.079	0.000	0.10		0.5	OK
1.001	3	109.037	-0.063	0.000	0.29		1.6	OK
3.000	4	109.014	-0.086	0.000	0.05		0.3	OK
1.002	5	108.896	-0.044	0.000	0.56		2.2	OK
4.000	6	109.021	-0.079	0.000	0.10		0.5	OK
4.001	7	108.909	-0.071	0.000	0.19		1.1	OK
1.003	8	108.890	-0.030	0.000	0.84		3.3	OK
1.004	9	108.852	-0.048	0.000	0.53		3.3	OK
1.005	10	108.818	-0.032	0.000	0.79		3.1	OK

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.840	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	30.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
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	1
Number of Online Controls	0	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)	20.000	Storm Duration (mins)	360
Ratio R	0.394		

Summary of Results for 360 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 75.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	109.217	-0.083	0.000	0.07		0.4	OK
2.000	2	109.117	-0.083	0.000	0.07		0.4	OK
1.001	3	109.031	-0.069	0.000	0.21		1.2	OK
3.000	4	109.012	-0.088	0.000	0.04		0.2	OK
1.002	5	108.884	-0.056	0.000	0.41		1.6	OK
4.000	6	109.017	-0.083	0.000	0.07		0.4	OK
4.001	7	108.905	-0.075	0.000	0.14		0.8	OK
1.003	8	108.876	-0.044	0.000	0.61		2.4	OK
1.004	9	108.843	-0.057	0.000	0.38		2.4	OK
1.005	10	108.805	-0.045	0.000	0.59		2.3	OK

Storage Structures for Storm

Cellular Storage Manhole: 10, DS/PN: 1.005

Invert Level (m) 108.750 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00792 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00792

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	36.3	36.3	0.801	0.0	63.5
0.800	36.3	63.5			

Summary of Results for 600 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 75.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	109.214	-0.086	0.000	0.05		0.3	OK
2.000	2	109.114	-0.086	0.000	0.05		0.3	OK
1.001	3	109.025	-0.075	0.000	0.14		0.8	OK
3.000	4	109.011	-0.089	0.000	0.02		0.2	OK
1.002	5	108.875	-0.065	0.000	0.27		1.1	OK
4.000	6	109.014	-0.086	0.000	0.05		0.3	OK
4.001	7	108.900	-0.080	0.000	0.09		0.5	OK
1.003	8	108.864	-0.056	0.000	0.41		1.6	OK
1.004	9	108.834	-0.066	0.000	0.26		1.6	OK
1.005	10	108.793	-0.057	0.000	0.39		1.6	OK

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes Lanc.mh

FSR Rainfall Model - England and Wales

Return Period (years)	1	Add Flow / Climate Change (%)	30
M5-60 (mm)	20.000	Minimum Backdrop Height (m)	0.200
Ratio R	0.394	Maximum Backdrop Height (m)	1.500
Maximum Rainfall (mm/hr)	50	Min Design Depth for Optimisation (m)	1.200
Maximum Time of Concentration (mins)	30	Min Vel for Auto Design only (m/s)	1.00
Foul Sewage (l/s/ha)	0.000	Min Slope for Optimisation (1:X)	500
Volumetric Runoff Coeff.	0.750		

Designed with Level Soffits

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)
1.000	14.820	0.200	74.1	0.005	5.00	0.0	0.600	o	100
1.001	12.000	0.120	100.0	0.005	0.00	0.0	0.600	o	100
1.002	10.000	0.100	100.0	0.008	0.00	0.0	0.600	o	100
2.000	14.000	0.420	33.3	0.005	5.00	0.0	0.600	o	100
1.003	2.000	0.130	15.4	0.005	0.00	0.0	0.600	o	100
3.000	11.490	0.200	57.5	0.005	5.00	0.0	0.600	o	100
3.001	5.360	0.093	57.6	0.003	0.00	0.0	0.600	o	100
1.004	7.100	0.100	71.0	0.004	0.00	0.0	0.600	o	100
1.005	2.000	0.020	100.0	0.000	0.00	0.0	0.600	o	150

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)
1.000	50.00	5.28	109.000	0.005	0.0	0.0	0.2	0.90	7.0	0.9
1.001	50.00	5.54	108.800	0.010	0.0	0.0	0.4	0.77	6.0	1.8
1.002	50.00	5.75	108.680	0.018	0.0	0.0	0.7	0.77	6.0	3.2
2.000	50.00	5.17	109.000	0.005	0.0	0.0	0.2	1.34	10.5	0.9
1.003	50.00	5.77	108.580	0.028	0.0	0.0	1.1	1.98	15.5	4.9
3.000	50.00	5.19	109.000	0.005	0.0	0.0	0.2	1.02	8.0	0.9
3.001	50.00	5.28	108.800	0.008	0.0	0.0	0.3	1.02	8.0	1.4
1.004	50.00	5.90	108.450	0.040	0.0	0.0	1.6	0.91	7.2	7.0
1.005	50.00	5.93	108.300	0.040	0.0	0.0	1.6	1.00	17.8	7.0

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.840	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	30.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
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	0	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)	20.000	Storm Duration (mins)	30
Ratio R	0.394		

Storage Structures for Storm

Cellular Storage Manhole: 9, DS/PN: 1.005

Invert Level (m) 108.350 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00792 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00792

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	44.0	44.0	0.801	0.0	68.0
0.800	44.0	68.0			

Summary of Results for 30 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 75.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	109.392	0.292	0.000	0.31		2.1	SURCHARGED
1.001	2	109.373	0.473	0.000	0.69		3.9	SURCHARGED
1.002	3	109.319	0.539	0.000	1.22		6.9	SURCHARGED
2.000	4	109.186	0.086	0.000	0.21		2.1	SURCHARGED
1.003	5	109.167	0.487	0.000	1.07		10.8	SURCHARGED
3.000	6	109.051	-0.049	0.000	0.30		2.3	OK
3.001	7	109.034	0.134	0.000	0.45		3.2	SURCHARGED
1.004	8	109.015	0.465	0.000	2.38		15.5	SURCHARGED
1.005	9	108.440	-0.010	0.000	1.00		10.8	OK

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.840	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	30.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
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	0	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)	20.000	Storm Duration (mins)	60
Ratio R	0.394		

Summary of Results for 60 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 75.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	109.032	-0.068	0.000	0.22		1.5	OK
1.001	2	108.952	0.052	0.000	0.51		2.9	SURCHARGED
1.002	3	108.922	0.142	0.000	0.91		5.1	SURCHARGED
2.000	4	109.026	-0.074	0.000	0.15		1.5	OK
1.003	5	108.839	0.159	0.000	0.79		7.9	SURCHARGED
3.000	6	109.030	-0.070	0.000	0.20		1.5	OK
3.001	7	108.840	-0.060	0.000	0.34		2.4	OK
1.004	8	108.756	0.206	0.000	1.75		11.4	SURCHARGED
1.005	9	108.414	-0.036	0.000	0.93		10.1	OK

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.840	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	30.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
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	0	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)	20.000	Storm Duration (mins)	120
Ratio R	0.394		

Summary of Results for 120 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 75.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	109.025	-0.075	0.000	0.14		0.9	OK
1.001	2	108.839	-0.061	0.000	0.32		1.8	OK
1.002	3	108.735	-0.045	0.000	0.59		3.3	OK
2.000	4	109.020	-0.080	0.000	0.09		0.9	OK
1.003	5	108.631	-0.049	0.000	0.51		5.2	OK
3.000	6	109.023	-0.077	0.000	0.12		0.9	OK
3.001	7	108.831	-0.069	0.000	0.21		1.5	OK
1.004	8	108.573	0.023	0.000	1.13		7.4	SURCHARGED
1.005	9	108.387	-0.063	0.000	0.64		6.9	OK

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.840	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	30.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
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	1
Number of Online Controls	0	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)	20.000	Storm Duration (mins)	240
Ratio R	0.394		

Summary of Results for 240 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 75.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	109.019	-0.081	0.000	0.08		0.5	OK
1.001	2	108.830	-0.070	0.000	0.19		1.1	OK
1.002	3	108.721	-0.059	0.000	0.35		2.0	OK
2.000	4	109.015	-0.085	0.000	0.05		0.5	OK
1.003	5	108.618	-0.062	0.000	0.31		3.1	OK
3.000	6	109.018	-0.082	0.000	0.07		0.5	OK
3.001	7	108.823	-0.077	0.000	0.12		0.9	OK
1.004	8	108.510	-0.040	0.000	0.67		4.4	OK
1.005	9	108.365	-0.085	0.000	0.39		4.3	OK

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.840	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	30.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
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	1
Number of Online Controls	0	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)	20.000	Storm Duration (mins)	360
Ratio R	0.394		

Summary of Results for 360 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 75.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	109.016	-0.084	0.000	0.06		0.4	OK
1.001	2	108.825	-0.075	0.000	0.14		0.8	OK
1.002	3	108.714	-0.066	0.000	0.26		1.4	OK
2.000	4	109.013	-0.087	0.000	0.04		0.4	OK
1.003	5	108.612	-0.068	0.000	0.22		2.2	OK
3.000	6	109.015	-0.085	0.000	0.05		0.4	OK
3.001	7	108.820	-0.080	0.000	0.09		0.6	OK
1.004	8	108.499	-0.051	0.000	0.49		3.2	OK
1.005	9	108.355	-0.095	0.000	0.29		3.1	OK

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.840	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	30.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
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	1
Number of Online Controls	0	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)	20.000	Storm Duration (mins)	600
Ratio R	0.394		

Summary of Results for 600 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 75.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	109.013	-0.087	0.000	0.04		0.3	OK
1.001	2	108.821	-0.079	0.000	0.09		0.5	OK
1.002	3	108.708	-0.072	0.000	0.17		1.0	OK
2.000	4	109.011	-0.089	0.000	0.03		0.3	OK
1.003	5	108.606	-0.074	0.000	0.15		1.5	OK
3.000	6	109.012	-0.088	0.000	0.04		0.3	OK
3.001	7	108.816	-0.084	0.000	0.06		0.4	OK
1.004	8	108.489	-0.061	0.000	0.33		2.1	OK
1.005	9	108.345	-0.105	0.000	0.20		2.1	OK

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes Lanc.mh

FSR Rainfall Model - England and Wales

Return Period (years)	1	Add Flow / Climate Change (%)	30
M5-60 (mm)	20.000	Minimum Backdrop Height (m)	0.200
Ratio R	0.394	Maximum Backdrop Height (m)	1.500
Maximum Rainfall (mm/hr)	50	Min Design Depth for Optimisation (m)	1.200
Maximum Time of Concentration (mins)	30	Min Vel for Auto Design only (m/s)	1.00
Foul Sewage (l/s/ha)	0.000	Min Slope for Optimisation (1:X)	500
Volumetric Runoff Coeff.	0.750		

Designed with Level Soffits

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)
1.000	11.740	0.120	97.8	0.005	5.00	0.0	0.600	o	100
1.001	11.470	0.130	88.2	0.005	0.00	0.0	0.600	o	100
1.002	6.630	0.200	33.2	0.000	0.00	0.0	0.600	o	100
2.000	20.000	0.200	100.0	0.005	5.00	0.0	0.600	o	100
2.001	11.000	0.150	73.3	0.005	0.00	0.0	0.600	o	100
1.003	16.100	0.200	80.5	0.000	0.00	0.0	0.600	o	100
3.000	11.690	0.120	97.4	0.008	5.00	0.0	0.600	o	100
3.001	20.000	0.200	100.0	0.005	0.00	0.0	0.600	o	100
3.002	3.750	0.230	16.3	0.005	0.00	0.0	0.600	o	100

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)
1.000	50.00	5.25	110.650	0.005	0.0	0.0	0.2	0.78	6.1	0.9
1.001	50.00	5.48	110.530	0.010	0.0	0.0	0.4	0.82	6.4	1.8
1.002	50.00	5.57	110.400	0.010	0.0	0.0	0.4	1.34	10.6	1.8
2.000	50.00	5.43	110.550	0.005	0.0	0.0	0.2	0.77	6.0	0.9
2.001	50.00	5.64	110.350	0.010	0.0	0.0	0.4	0.90	7.1	1.8
1.003	50.00	5.95	110.200	0.020	0.0	0.0	0.8	0.86	6.7	3.5
3.000	50.00	5.25	110.550	0.008	0.0	0.0	0.3	0.78	6.1	1.4
3.001	50.00	5.68	110.430	0.013	0.0	0.0	0.5	0.77	6.0	2.3
3.002	50.00	5.72	110.230	0.018	0.0	0.0	0.7	1.92	15.1	3.2

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)
1.004	3.600	0.100	36.0	0.000	0.00	0.0	0.600	o	100
1.005	2.000	0.020	100.0	0.000	0.00	0.0	0.600	o	150

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)
1.004	50.00	6.00	110.000	0.038	0.0	0.0	1.5	1.29	10.1	6.7
1.005	49.89	6.03	109.850	0.038	0.0	0.0	1.5	1.00	17.8	6.7

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.840	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	30.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
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	0	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)	20.000	Storm Duration (mins)	30
Ratio R	0.394		

Storage Structures for Storm

Cellular Storage Manhole: 11, DS/PN: 1.005

Invert Level (m) 109.900 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00792 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00792

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	44.0	44.0	0.801	0.0	68.0
0.800	44.0	68.0			

Summary of Results for 30 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 75.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	110.693	-0.057	0.000	0.39		2.3	OK
1.001	2	110.674	0.044	0.000	0.72		4.4	SURCHARGED
1.002	3	110.620	0.120	0.000	0.40		3.8	SURCHARGED
2.000	4	110.662	0.012	0.000	0.38		2.2	SURCHARGED
2.001	5	110.638	0.188	0.000	0.58		3.8	SURCHARGED
1.003	6	110.587	0.287	0.000	1.18		7.6	SURCHARGED
3.000	7	110.608	-0.042	0.000	0.63		3.6	OK
3.001	8	110.563	0.033	0.000	0.95		5.6	SURCHARGED
3.002	9	110.387	0.057	0.000	0.59		7.5	SURCHARGED
1.004	10	110.308	0.208	0.000	1.77		15.0	SURCHARGED
1.005	11	109.985	-0.015	0.000	1.00		10.8	OK

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.840	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	30.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
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	0	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)	20.000	Storm Duration (mins)	60
Ratio R	0.394		

Summary of Results for 60 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 75.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	110.685	-0.065	0.000	0.26		1.5	OK
1.001	2	110.580	-0.050	0.000	0.50		3.0	OK
1.002	3	110.439	-0.061	0.000	0.31		3.0	OK
2.000	4	110.584	-0.066	0.000	0.25		1.5	OK
2.001	5	110.397	-0.053	0.000	0.45		3.0	OK
1.003	6	110.338	0.038	0.000	0.92		5.9	SURCHARGED
3.000	7	110.595	-0.055	0.000	0.41		2.4	OK
3.001	8	110.490	-0.040	0.000	0.66		3.9	OK
3.002	9	110.276	-0.054	0.000	0.42		5.3	OK
1.004	10	110.170	0.070	0.000	1.33		11.2	SURCHARGED
1.005	11	109.961	-0.039	0.000	0.90		9.7	OK

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.840	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	30.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
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	0	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)	20.000	Storm Duration (mins)	120
Ratio R	0.394		

Summary of Results for 120 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 75.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	110.677	-0.073	0.000	0.16		0.9	OK
1.001	2	110.568	-0.062	0.000	0.30		1.8	OK
1.002	3	110.430	-0.070	0.000	0.19		1.8	OK
2.000	4	110.576	-0.074	0.000	0.16		0.9	OK
2.001	5	110.386	-0.064	0.000	0.28		1.8	OK
1.003	6	110.254	-0.046	0.000	0.57		3.7	OK
3.000	7	110.584	-0.066	0.000	0.26		1.5	OK
3.001	8	110.475	-0.055	0.000	0.41		2.4	OK
3.002	9	110.265	-0.065	0.000	0.26		3.3	OK
1.004	10	110.070	-0.030	0.000	0.82		7.0	OK
1.005	11	109.934	-0.066	0.000	0.60		6.5	OK

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.840	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	30.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
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	1
Number of Online Controls	0	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)	20.000	Storm Duration (mins)	240
Ratio R	0.394		

Summary of Results for 240 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 75.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	110.671	-0.079	0.000	0.10		0.5	OK
1.001	2	110.559	-0.071	0.000	0.18		1.1	OK
1.002	3	110.422	-0.078	0.000	0.12		1.1	OK
2.000	4	110.571	-0.079	0.000	0.09		0.5	OK
2.001	5	110.377	-0.073	0.000	0.17		1.1	OK
1.003	6	110.240	-0.060	0.000	0.34		2.2	OK
3.000	7	110.576	-0.074	0.000	0.15		0.9	OK
3.001	8	110.463	-0.067	0.000	0.25		1.4	OK
3.002	9	110.256	-0.074	0.000	0.16		2.0	OK
1.004	10	110.049	-0.051	0.000	0.49		4.2	OK
1.005	11	109.913	-0.087	0.000	0.37		4.1	OK

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.840	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	30.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
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	1
Number of Online Controls	0	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)	20.000	Storm Duration (mins)	360
Ratio R	0.394		

Summary of Results for 360 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 75.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	110.667	-0.083	0.000	0.07		0.4	OK
1.001	2	110.554	-0.076	0.000	0.13		0.8	OK
1.002	3	110.419	-0.081	0.000	0.08		0.8	OK
2.000	4	110.567	-0.083	0.000	0.07		0.4	OK
2.001	5	110.373	-0.077	0.000	0.12		0.8	OK
1.003	6	110.234	-0.066	0.000	0.25		1.6	OK
3.000	7	110.572	-0.078	0.000	0.11		0.6	OK
3.001	8	110.458	-0.072	0.000	0.18		1.0	OK
3.002	9	110.252	-0.078	0.000	0.11		1.4	OK
1.004	10	110.041	-0.059	0.000	0.36		3.0	OK
1.005	11	109.903	-0.097	0.000	0.28		3.0	OK

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.840	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	30.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
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	1
Number of Online Controls	0	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)	20.000	Storm Duration (mins)	600
Ratio R	0.394		

Summary of Results for 600 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 75.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	110.664	-0.086	0.000	0.05		0.3	OK
1.001	2	110.550	-0.080	0.000	0.09		0.5	OK
1.002	3	110.415	-0.085	0.000	0.06		0.5	OK
2.000	4	110.564	-0.086	0.000	0.05		0.3	OK
2.001	5	110.369	-0.081	0.000	0.08		0.5	OK
1.003	6	110.227	-0.073	0.000	0.17		1.1	OK
3.000	7	110.568	-0.082	0.000	0.07		0.4	OK
3.001	8	110.453	-0.077	0.000	0.12		0.7	OK
3.002	9	110.248	-0.082	0.000	0.08		1.0	OK
1.004	10	110.033	-0.067	0.000	0.24		2.0	OK
1.005	11	109.894	-0.106	0.000	0.19		2.0	OK

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes Lanc.mh

FSR Rainfall Model - England and Wales

Return Period (years)	1	Add Flow / Climate Change (%)	30
M5-60 (mm)	20.000	Minimum Backdrop Height (m)	0.200
Ratio R	0.394	Maximum Backdrop Height (m)	1.500
Maximum Rainfall (mm/hr)	50	Min Design Depth for Optimisation (m)	1.200
Maximum Time of Concentration (mins)	30	Min Vel for Auto Design only (m/s)	1.00
Foul Sewage (l/s/ha)	0.000	Min Slope for Optimisation (1:X)	500
Volumetric Runoff Coeff.	0.750		

Designed with Level Soffits

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)
1.000	13.960	0.150	93.1	0.005	5.00	0.0	0.600	o	150
2.000	18.610	0.200	93.1	0.005	5.00	0.0	0.600	o	100
3.000	18.610	0.200	93.1	0.005	5.00	0.0	0.600	o	100
4.000	30.000	0.350	85.7	0.005	5.00	0.0	0.600	o	150
1.001	7.000	0.100	70.0	0.005	0.00	0.0	0.600	o	150
5.000	30.000	0.400	75.0	0.005	5.00	0.0	0.600	o	100
1.002	1.000	0.050	20.0	0.005	0.00	0.0	0.600	o	150

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)
1.000	50.00	5.22	109.700	0.005	0.0	0.0	0.2	1.04	18.4	0.9
2.000	50.00	5.39	110.750	0.005	0.0	0.0	0.2	0.80	6.3	0.9
3.000	50.00	5.39	110.750	0.005	0.0	0.0	0.2	0.80	6.3	0.9
4.000	50.00	5.46	109.900	0.005	0.0	0.0	0.2	1.09	19.2	0.9
1.001	50.00	5.56	109.550	0.025	0.0	0.0	1.0	1.20	21.3	4.4
5.000	50.00	5.56	109.900	0.005	0.0	0.0	0.2	0.89	7.0	0.9
1.002	50.00	5.57	109.450	0.035	0.0	0.0	1.4	2.26	40.0	6.2

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)
1.003	13.800	0.150	92.0	0.000	0.00	0.0	0.600	o	150
6.000	14.500	0.200	72.5	0.005	5.00	0.0	0.600	o	100
1.004	3.500	0.100	35.0	0.000	0.00	0.0	0.600	o	150
7.000	16.600	0.380	43.7	0.005	5.00	0.0	0.600	o	100
8.000	14.500	0.230	63.0	0.005	5.00	0.0	0.600	o	100
7.001	11.400	0.200	57.0	0.006	0.00	0.0	0.600	o	150
7.002	3.200	0.100	32.0	0.000	0.00	0.0	0.600	o	150
1.005	2.000	0.020	100.0	0.000	0.00	0.0	0.600	o	150
1.006	2.000	0.020	100.0	0.000	0.00	0.0	0.600	o	150

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)
1.003	50.00	5.79	109.400	0.035	0.0	0.0	1.4	1.05	18.5	6.2
6.000	50.00	5.27	109.500	0.005	0.0	0.0	0.2	0.91	7.1	0.9
1.004	50.00	5.82	109.250	0.040	0.0	0.0	1.6	1.71	30.2	7.0
7.000	50.00	5.24	110.880	0.005	0.0	0.0	0.2	1.17	9.2	0.9
8.000	50.00	5.25	110.730	0.005	0.0	0.0	0.2	0.97	7.6	0.9
7.001	50.00	5.39	110.450	0.016	0.0	0.0	0.6	1.33	23.6	2.8
7.002	50.00	5.42	110.250	0.016	0.0	0.0	0.6	1.79	31.6	2.8
1.005	50.00	5.86	109.150	0.056	0.0	0.0	2.3	1.00	17.8	9.9
1.006	50.00	5.89	109.130	0.056	0.0	0.0	2.3	1.00	17.8	9.9

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.840	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	30.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
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	0	Number of Time/Area Diagrams	0
Number of Offline Controls	0		

Synthetic Rainfall Details

Simulation Criteria for Storm

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)	20.000	Storm Duration (mins)	30
Ratio R	0.394		

Storage Structures for Storm

Cellular Storage Manhole: 16, DS/PN: 1.006

Invert Level (m) 109.200 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00792 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00792

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	63.0	63.0	0.801	0.0	97.4
0.800	63.0	97.4			

Summary of Results for 30 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 75.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	109.736	-0.114	0.000	0.13		2.3	OK
2.000	2	110.792	-0.058	0.000	0.37		2.3	OK
3.000	3	110.792	-0.058	0.000	0.37		2.3	OK
4.000	4	109.935	-0.115	0.000	0.12		2.2	OK
1.001	5	109.688	-0.012	0.000	0.58		10.5	OK
5.000	6	109.939	-0.061	0.000	0.33		2.2	OK
1.002	7	109.655	0.055	0.000	1.04		14.5	SURCHARGED
1.003	8	109.601	0.051	0.000	0.85		14.5	SURCHARGED
6.000	9	109.540	-0.060	0.000	0.33		2.3	OK
1.004	10	109.490	0.090	0.000	0.84		16.6	SURCHARGED
7.000	11	110.914	-0.066	0.000	0.26		2.3	OK
8.000	12	110.768	-0.062	0.000	0.31		2.3	OK
7.001	13	110.511	-0.089	0.000	0.34		7.3	OK
7.002	14	110.313	-0.087	0.000	0.37		7.3	OK
1.005	15	109.419	0.119	0.000	2.18		23.6	SURCHARGED
1.006	16	109.309	0.029	0.000	1.37		14.9	SURCHARGED

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.840	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	30.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
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	0	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)	20.000	Storm Duration (mins)	60
Ratio R	0.394		

Summary of Results for 60 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 75.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	109.730	-0.120	0.000	0.09		1.5	OK
2.000	2	110.784	-0.066	0.000	0.25		1.5	OK
3.000	3	110.784	-0.066	0.000	0.25		1.5	OK
4.000	4	109.928	-0.122	0.000	0.08		1.5	OK
1.001	5	109.617	-0.083	0.000	0.41		7.4	OK
5.000	6	109.932	-0.068	0.000	0.22		1.5	OK
1.002	7	109.548	-0.052	0.000	0.74		10.4	OK
1.003	8	109.486	-0.064	0.000	0.61		10.4	OK
6.000	9	109.532	-0.068	0.000	0.22		1.5	OK
1.004	10	109.380	-0.020	0.000	0.60		11.9	OK
7.000	11	110.908	-0.072	0.000	0.17		1.5	OK
8.000	12	110.761	-0.069	0.000	0.21		1.5	OK
7.001	13	110.498	-0.102	0.000	0.22		4.8	OK
7.002	14	110.300	-0.100	0.000	0.24		4.8	OK
1.005	15	109.344	0.044	0.000	1.54		16.7	SURCHARGED
1.006	16	109.283	0.003	0.000	1.00		10.9	SURCHARGED

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.840	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	30.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
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	0	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)	20.000	Storm Duration (mins)	120
Ratio R	0.394		

Summary of Results for 120 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 75.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	109.722	-0.128	0.000	0.05		0.9	OK
2.000	2	110.776	-0.074	0.000	0.15		0.9	OK
3.000	3	110.776	-0.074	0.000	0.15		0.9	OK
4.000	4	109.921	-0.129	0.000	0.05		0.9	OK
1.001	5	109.601	-0.099	0.000	0.25		4.6	OK
5.000	6	109.924	-0.076	0.000	0.14		0.9	OK
1.002	7	109.521	-0.079	0.000	0.46		6.4	OK
1.003	8	109.464	-0.086	0.000	0.38		6.4	OK
6.000	9	109.524	-0.076	0.000	0.14		0.9	OK
1.004	10	109.313	-0.087	0.000	0.37		7.3	OK
7.000	11	110.902	-0.078	0.000	0.10		0.9	OK
8.000	12	110.754	-0.076	0.000	0.13		0.9	OK
7.001	13	110.487	-0.113	0.000	0.14		2.9	OK
7.002	14	110.288	-0.112	0.000	0.15		2.9	OK
1.005	15	109.266	-0.034	0.000	0.95		10.3	OK
1.006	16	109.238	-0.042	0.000	0.86		9.4	OK

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.840	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	30.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
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	1
Number of Online Controls	0	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)	20.000	Storm Duration (mins)	240
Ratio R	0.394		

Summary of Results for 240 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 75.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	109.718	-0.132	0.000	0.03		0.5	OK
2.000	2	110.770	-0.080	0.000	0.09		0.5	OK
3.000	3	110.770	-0.080	0.000	0.09		0.5	OK
4.000	4	109.917	-0.133	0.000	0.03		0.5	OK
1.001	5	109.589	-0.111	0.000	0.15		2.7	OK
5.000	6	109.919	-0.081	0.000	0.08		0.5	OK
1.002	7	109.503	-0.097	0.000	0.27		3.8	OK
1.003	8	109.448	-0.102	0.000	0.23		3.8	OK
6.000	9	109.519	-0.081	0.000	0.08		0.5	OK
1.004	10	109.298	-0.102	0.000	0.22		4.4	OK
7.000	11	110.896	-0.084	0.000	0.06		0.5	OK
8.000	12	110.748	-0.082	0.000	0.08		0.5	OK
7.001	13	110.479	-0.121	0.000	0.08		1.8	OK
7.002	14	110.280	-0.120	0.000	0.09		1.8	OK
1.005	15	109.231	-0.069	0.000	0.57		6.1	OK
1.006	16	109.209	-0.071	0.000	0.55		5.9	OK

Storage Structures for Storm

Cellular Storage Manhole: 16, DS/PN: 1.006

Invert Level (m) 109.200 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00792 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00792

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	63.0	63.0	0.801	0.0	97.4
0.800	63.0	97.4			

Summary of Results for 360 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 75.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	109.716	-0.134	0.000	0.02		0.4	OK
2.000	2	110.767	-0.083	0.000	0.07		0.4	OK
3.000	3	110.767	-0.083	0.000	0.07		0.4	OK
4.000	4	109.915	-0.135	0.000	0.02		0.4	OK
1.001	5	109.583	-0.117	0.000	0.11		2.0	OK
5.000	6	109.915	-0.085	0.000	0.06		0.4	OK
1.002	7	109.495	-0.105	0.000	0.20		2.8	OK
1.003	8	109.441	-0.109	0.000	0.16		2.8	OK
6.000	9	109.516	-0.084	0.000	0.06		0.4	OK
1.004	10	109.290	-0.110	0.000	0.16		3.2	OK
7.000	11	110.894	-0.086	0.000	0.05		0.4	OK
8.000	12	110.745	-0.085	0.000	0.06		0.4	OK
7.001	13	110.474	-0.126	0.000	0.06		1.3	OK
7.002	14	110.275	-0.125	0.000	0.06		1.3	OK
1.005	15	109.217	-0.083	0.000	0.41		4.5	OK
1.006	16	109.197	-0.083	0.000	0.41		4.5	OK

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.840	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	30.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
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	1
Number of Online Controls	0	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)	20.000	Storm Duration (mins)	600
Ratio R	0.394		

Summary of Results for 600 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 75.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	109.711	-0.139	0.000	0.02		0.3	OK
2.000	2	110.763	-0.087	0.000	0.04		0.3	OK
3.000	3	110.763	-0.087	0.000	0.04		0.3	OK
4.000	4	109.910	-0.140	0.000	0.01		0.3	OK
1.001	5	109.577	-0.123	0.000	0.07		1.3	OK
5.000	6	109.913	-0.087	0.000	0.04		0.3	OK
1.002	7	109.486	-0.114	0.000	0.13		1.9	OK
1.003	8	109.433	-0.117	0.000	0.11		1.9	OK
6.000	9	109.513	-0.087	0.000	0.04		0.3	OK
1.004	10	109.283	-0.117	0.000	0.11		2.1	OK
7.000	11	110.891	-0.089	0.000	0.03		0.3	OK
8.000	12	110.742	-0.088	0.000	0.04		0.3	OK
7.001	13	110.469	-0.131	0.000	0.04		0.9	OK
7.002	14	110.270	-0.130	0.000	0.04		0.9	OK
1.005	15	109.203	-0.097	0.000	0.28		3.0	OK
1.006	16	109.183	-0.097	0.000	0.28		3.0	OK

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes Lanc.mh

FSR Rainfall Model - England and Wales

Return Period (years)	1	Add Flow / Climate Change (%)	30
M5-60 (mm)	20.000	Minimum Backdrop Height (m)	0.200
Ratio R	0.394	Maximum Backdrop Height (m)	1.500
Maximum Rainfall (mm/hr)	50	Min Design Depth for Optimisation (m)	1.200
Maximum Time of Concentration (mins)	30	Min Vel for Auto Design only (m/s)	1.00
Foul Sewage (l/s/ha)	0.000	Min Slope for Optimisation (1:X)	500
Volumetric Runoff Coeff.	0.750		

Designed with Level Soffits

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)
1.000	13.000	0.150	86.7	0.005	5.00	0.0	0.600	o	100
1.001	26.010	0.350	74.3	0.005	0.00	0.0	0.600	o	100
1.002	6.110	0.100	61.1	0.000	0.00	0.0	0.600	o	100
2.000	4.420	0.100	44.2	0.003	5.00	0.0	0.600	o	100
2.001	22.100	0.350	63.1	0.003	0.00	0.0	0.600	o	100
2.002	4.880	0.150	32.5	0.005	0.00	0.0	0.600	o	100
1.003	5.270	0.920	5.7	0.000	0.00	0.0	0.600	o	100
3.000	4.500	0.050	90.0	0.005	5.00	0.0	0.600	o	100
3.001	2.000	0.020	100.0	0.003	0.00	0.0	0.600	o	100

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)
1.000	50.00	5.26	112.100	0.005	0.0	0.0	0.2	0.83	6.5	0.9
1.001	50.00	5.75	111.950	0.010	0.0	0.0	0.4	0.89	7.0	1.8
1.002	50.00	5.85	111.600	0.010	0.0	0.0	0.4	0.99	7.8	1.8
2.000	50.00	5.06	112.100	0.003	0.0	0.0	0.1	1.16	9.1	0.5
2.001	50.00	5.44	112.000	0.006	0.0	0.0	0.2	0.97	7.6	1.1
2.002	50.00	5.50	111.650	0.011	0.0	0.0	0.4	1.36	10.7	1.9
1.003	50.00	5.88	111.500	0.021	0.0	0.0	0.9	3.25	25.5	3.7
3.000	50.00	5.09	110.650	0.005	0.0	0.0	0.2	0.81	6.4	0.9
3.001	50.00	5.14	110.600	0.008	0.0	0.0	0.3	0.77	6.0	1.4

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)
1.004	2.000	0.020	100.0	0.000	0.00	0.0	0.600	o	100

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)
1.004	50.00	5.92	110.580	0.029	0.0	0.0	1.2	0.77	6.0	5.1

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.840	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	30.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
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	0	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)	20.000	Storm Duration (mins)	30
Ratio R	0.394		

Storage Structures for Storm

Cellular Storage Manhole: 10, DS/PN: 1.004

Invert Level (m) 110.580 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00792 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00792

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	32.0	32.0	0.810	0.0	60.8
0.800	32.0	60.8			

Summary of Results for 30 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 75.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	112.142	-0.058	0.000	0.37		2.3	OK
1.001	2	112.010	-0.040	0.000	0.66		4.5	OK
1.002	3	111.659	-0.041	0.000	0.65		4.5	OK
2.000	4	112.128	-0.072	0.000	0.17		1.4	OK
2.001	5	112.042	-0.058	0.000	0.37		2.7	OK
2.002	6	111.703	-0.047	0.000	0.54		5.0	OK
1.003	7	111.545	-0.055	0.000	0.42		9.5	OK
3.000	8	110.746	-0.004	0.000	0.40		2.2	OK
3.001	9	110.738	0.038	0.000	0.88		3.5	SURCHARGED
1.004	10	110.733	0.053	0.000	1.97		7.7	SURCHARGED

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.840	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	30.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
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	0	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)	20.000	Storm Duration (mins)	60
Ratio R	0.394		

Summary of Results for 60 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 75.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	112.133	-0.067	0.000	0.24		1.5	OK
1.001	2	111.996	-0.054	0.000	0.44		3.0	OK
1.002	3	111.646	-0.054	0.000	0.43		3.0	OK
2.000	4	112.122	-0.078	0.000	0.11		0.9	OK
2.001	5	112.033	-0.067	0.000	0.24		1.8	OK
2.002	6	111.691	-0.059	0.000	0.36		3.3	OK
1.003	7	111.536	-0.064	0.000	0.28		6.2	OK
3.000	8	110.722	-0.028	0.000	0.26		1.5	OK
3.001	9	110.716	0.016	0.000	0.58		2.3	SURCHARGED
1.004	10	110.712	0.032	0.000	1.67		6.6	SURCHARGED

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.840	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	30.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
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	0	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)	20.000	Storm Duration (mins)	120
Ratio R	0.394		

Summary of Results for 120 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 75.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	112.126	-0.074	0.000	0.15		0.9	OK
1.001	2	111.985	-0.065	0.000	0.27		1.8	OK
1.002	3	111.635	-0.065	0.000	0.27		1.8	OK
2.000	4	112.117	-0.083	0.000	0.07		0.6	OK
2.001	5	112.026	-0.074	0.000	0.15		1.1	OK
2.002	6	111.682	-0.068	0.000	0.22		2.0	OK
1.003	7	111.528	-0.072	0.000	0.17		3.9	OK
3.000	8	110.690	-0.060	0.000	0.17		0.9	OK
3.001	9	110.685	-0.015	0.000	0.37		1.4	OK
1.004	10	110.682	0.002	0.000	1.17		4.6	SURCHARGED

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.840	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	30.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
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	1
Number of Online Controls	0	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)	20.000	Storm Duration (mins)	240
Ratio R	0.394		

Summary of Results for 240 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 75.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	112.120	-0.080	0.000	0.09		0.6	OK
1.001	2	111.977	-0.073	0.000	0.16		1.1	OK
1.002	3	111.626	-0.074	0.000	0.16		1.1	OK
2.000	4	112.113	-0.087	0.000	0.04		0.3	OK
2.001	5	112.020	-0.080	0.000	0.09		0.7	OK
2.002	6	111.674	-0.076	0.000	0.13		1.2	OK
1.003	7	111.521	-0.079	0.000	0.10		2.3	OK
3.000	8	110.671	-0.079	0.000	0.10		0.5	OK
3.001	9	110.648	-0.052	0.000	0.22		0.9	OK
1.004	10	110.646	-0.034	0.000	0.77		3.0	OK

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.840	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	30.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
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	1
Number of Online Controls	0	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)	20.000	Storm Duration (mins)	360
Ratio R	0.394		

Summary of Results for 360 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 75.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	112.117	-0.083	0.000	0.07		0.4	OK
1.001	2	111.973	-0.077	0.000	0.12		0.8	OK
1.002	3	111.622	-0.078	0.000	0.12		0.8	OK
2.000	4	112.111	-0.089	0.000	0.03		0.2	OK
2.001	5	112.017	-0.083	0.000	0.07		0.5	OK
2.002	6	111.671	-0.079	0.000	0.09		0.9	OK
1.003	7	111.518	-0.082	0.000	0.07		1.7	OK
3.000	8	110.668	-0.082	0.000	0.07		0.4	OK
3.001	9	110.636	-0.064	0.000	0.16		0.6	OK
1.004	10	110.634	-0.046	0.000	0.57		2.2	OK

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.840	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	30.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
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	1
Number of Online Controls	0	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)	20.000	Storm Duration (mins)	600
Ratio R	0.394		

Summary of Results for 600 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 75.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	112.113	-0.087	0.000	0.04		0.3	OK
1.001	2	111.969	-0.081	0.000	0.08		0.5	OK
1.002	3	111.618	-0.082	0.000	0.08		0.5	OK
2.000	4	112.109	-0.091	0.000	0.02		0.2	OK
2.001	5	112.013	-0.087	0.000	0.04		0.3	OK
2.002	6	111.666	-0.084	0.000	0.06		0.6	OK
1.003	7	111.514	-0.086	0.000	0.05		1.1	OK
3.000	8	110.664	-0.086	0.000	0.05		0.3	OK
3.001	9	110.626	-0.074	0.000	0.11		0.4	OK
1.004	10	110.623	-0.057	0.000	0.38		1.5	OK

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes Lanc.mh

FSR Rainfall Model - England and Wales

Return Period (years)	1	Add Flow / Climate Change (%)	30
M5-60 (mm)	20.000	Minimum Backdrop Height (m)	0.200
Ratio R	0.394	Maximum Backdrop Height (m)	1.500
Maximum Rainfall (mm/hr)	50	Min Design Depth for Optimisation (m)	1.200
Maximum Time of Concentration (mins)	30	Min Vel for Auto Design only (m/s)	1.00
Foul Sewage (l/s/ha)	0.000	Min Slope for Optimisation (1:X)	500
Volumetric Runoff Coeff.	0.750		

Designed with Level Soffits

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)
1.000	14.630	0.150	97.5	0.005	5.00	0.0	0.600	o	100
1.001	17.320	0.300	57.7	0.005	0.00	0.0	0.600	o	100
2.000	18.730	0.450	41.6	0.005	5.00	0.0	0.600	o	100
3.000	11.130	0.400	27.8	0.005	5.00	0.0	0.600	o	100
3.001	11.260	0.100	112.6	0.005	0.00	0.0	0.600	o	100
1.002	19.760	1.100	18.0	0.000	0.00	0.0	0.600	o	100
4.000	14.130	0.150	94.2	0.005	5.00	0.0	0.600	o	100
4.001	9.750	0.350	27.9	0.005	0.00	0.0	0.600	o	100

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)
1.000	50.00	5.31	111.900	0.005	0.0	0.0	0.2	0.78	6.1	0.9
1.001	50.00	5.60	111.750	0.010	0.0	0.0	0.4	1.02	8.0	1.8
2.000	50.00	5.26	111.900	0.005	0.0	0.0	0.2	1.20	9.4	0.9
3.000	50.00	5.13	111.950	0.005	0.0	0.0	0.2	1.47	11.5	0.9
3.001	50.00	5.39	111.550	0.010	0.0	0.0	0.4	0.72	5.7	1.8
1.002	50.00	5.78	111.450	0.025	0.0	0.0	1.0	1.83	14.4	4.4
4.000	50.00	5.30	111.850	0.005	0.0	0.0	0.2	0.79	6.2	0.9
4.001	50.00	5.41	111.700	0.010	0.0	0.0	0.4	1.47	11.5	1.8

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)
1.003	4.860	0.050	97.2	0.005	0.00	0.0	0.600	o	150
5.000	17.420	0.300	58.1	0.010	5.00	0.0	0.600	o	100
5.001	3.510	0.400	8.8	0.006	0.00	0.0	0.600	o	100
1.004	2.000	0.020	100.0	0.000	0.00	0.0	0.600	o	150

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)
1.003	50.00	5.86	110.300	0.040	0.0	0.0	1.6	1.02	18.0	7.0
5.000	50.00	5.29	111.900	0.010	0.0	0.0	0.4	1.01	8.0	1.8
5.001	50.00	5.31	111.600	0.016	0.0	0.0	0.6	2.63	20.6	2.8
1.004	50.00	5.89	110.250	0.056	0.0	0.0	2.3	1.00	17.8	9.9

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.840	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	30.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
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	0	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)	20.000	Storm Duration (mins)	30
Ratio R	0.394		

Storage Structures for Storm

Cellular Storage Manhole: 12, DS/PN: 1.004

Invert Level (m) 111.450 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00792 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00792

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	70.0	70.0	0.801	0.0	97.2
0.800	70.0	97.2			

Summary of Results for 30 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 75.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	111.943	-0.057	0.000	0.39		2.3	OK
1.001	2	111.806	-0.044	0.000	0.59		4.5	OK
2.000	3	111.934	-0.066	0.000	0.25		2.3	OK
3.000	4	111.981	-0.069	0.000	0.21		2.3	OK
3.001	5	111.622	-0.028	0.000	0.85		4.5	OK
1.002	6	111.519	-0.031	0.000	0.82		11.3	OK
4.000	7	111.893	-0.057	0.000	0.38		2.3	OK
4.001	8	111.746	-0.054	0.000	0.42		4.5	OK
1.003	9	110.620	0.170	0.000	1.30		18.1	SURCHARGED
5.000	10	111.955	-0.045	0.000	0.59		4.5	OK
5.001	11	111.645	-0.055	0.000	0.42		7.2	OK
1.004	12	110.536	0.136	0.000	2.33		25.3	SURCHARGED

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.840	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	30.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
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	0	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)	20.000	Storm Duration (mins)	60
Ratio R	0.394		

Summary of Results for 60 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 75.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	111.934	-0.066	0.000	0.25		1.5	OK
1.001	2	111.794	-0.056	0.000	0.39		3.0	OK
2.000	3	111.927	-0.073	0.000	0.17		1.5	OK
3.000	4	111.975	-0.075	0.000	0.14		1.5	OK
3.001	5	111.604	-0.046	0.000	0.56		3.0	OK
1.002	6	111.503	-0.047	0.000	0.54		7.4	OK
4.000	7	111.884	-0.066	0.000	0.25		1.5	OK
4.001	8	111.736	-0.064	0.000	0.28		3.0	OK
1.003	9	110.482	0.032	0.000	0.85		11.9	SURCHARGED
5.000	10	111.943	-0.057	0.000	0.39		3.0	OK
5.001	11	111.636	-0.064	0.000	0.28		4.8	OK
1.004	12	110.444	0.044	0.000	1.54		16.7	SURCHARGED

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.840	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	30.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
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	0	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)	20.000	Storm Duration (mins)	120
Ratio R	0.394		

Summary of Results for 120 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 75.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	111.926	-0.074	0.000	0.16		0.9	OK
1.001	2	111.783	-0.067	0.000	0.24		1.8	OK
2.000	3	111.921	-0.079	0.000	0.10		0.9	OK
3.000	4	111.970	-0.080	0.000	0.09		0.9	OK
3.001	5	111.590	-0.060	0.000	0.35		1.8	OK
1.002	6	111.490	-0.060	0.000	0.33		4.6	OK
4.000	7	111.876	-0.074	0.000	0.16		0.9	OK
4.001	8	111.728	-0.072	0.000	0.17		1.8	OK
1.003	9	110.380	-0.070	0.000	0.52		7.3	OK
5.000	10	111.933	-0.067	0.000	0.24		1.8	OK
5.001	11	111.628	-0.072	0.000	0.17		2.9	OK
1.004	12	110.366	-0.034	0.000	0.95		10.3	OK

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.840	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	30.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
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	1
Number of Online Controls	0	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)	20.000	Storm Duration (mins)	240
Ratio R	0.394		

Summary of Results for 240 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 75.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	111.921	-0.079	0.000	0.09		0.5	OK
1.001	2	111.775	-0.075	0.000	0.14		1.1	OK
2.000	3	111.916	-0.084	0.000	0.06		0.5	OK
3.000	4	111.964	-0.086	0.000	0.05		0.5	OK
3.001	5	111.581	-0.069	0.000	0.21		1.1	OK
1.002	6	111.480	-0.070	0.000	0.20		2.7	OK
4.000	7	111.870	-0.080	0.000	0.09		0.5	OK
4.001	8	111.721	-0.079	0.000	0.10		1.1	OK
1.003	9	110.357	-0.093	0.000	0.31		4.4	OK
5.000	10	111.925	-0.075	0.000	0.14		1.1	OK
5.001	11	111.621	-0.079	0.000	0.10		1.8	OK
1.004	12	110.331	-0.069	0.000	0.56		6.1	OK

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.840	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	30.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
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	1
Number of Online Controls	0	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)	20.000	Storm Duration (mins)	360
Ratio R	0.394		

Summary of Results for 360 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 75.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	111.917	-0.083	0.000	0.07		0.4	OK
1.001	2	111.771	-0.079	0.000	0.10		0.8	OK
2.000	3	111.913	-0.087	0.000	0.04		0.4	OK
3.000	4	111.962	-0.088	0.000	0.04		0.4	OK
3.001	5	111.576	-0.074	0.000	0.15		0.8	OK
1.002	6	111.475	-0.075	0.000	0.14		2.0	OK
4.000	7	111.867	-0.083	0.000	0.07		0.4	OK
4.001	8	111.718	-0.082	0.000	0.07		0.8	OK
1.003	9	110.348	-0.102	0.000	0.23		3.2	OK
5.000	10	111.922	-0.078	0.000	0.10		0.8	OK
5.001	11	111.618	-0.082	0.000	0.07		1.3	OK
1.004	12	110.317	-0.083	0.000	0.41		4.5	OK

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.840	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	30.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
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	1
Number of Online Controls	0	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)	20.000	Storm Duration (mins)	600
Ratio R	0.394		

Summary of Results for 600 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 75.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	111.914	-0.086	0.000	0.05		0.3	OK
1.001	2	111.767	-0.083	0.000	0.07		0.5	OK
2.000	3	111.911	-0.089	0.000	0.03		0.3	OK
3.000	4	111.961	-0.089	0.000	0.02		0.3	OK
3.001	5	111.571	-0.079	0.000	0.10		0.5	OK
1.002	6	111.471	-0.079	0.000	0.10		1.3	OK
4.000	7	111.864	-0.086	0.000	0.05		0.3	OK
4.001	8	111.714	-0.086	0.000	0.05		0.5	OK
1.003	9	110.339	-0.111	0.000	0.15		2.1	OK
5.000	10	111.917	-0.083	0.000	0.07		0.5	OK
5.001	11	111.614	-0.086	0.000	0.05		0.9	OK
1.004	12	110.303	-0.097	0.000	0.28		3.0	OK

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes Lanc.mh

FSR Rainfall Model - England and Wales

Return Period (years)	1	Add Flow / Climate Change (%)	30
M5-60 (mm)	20.000	Minimum Backdrop Height (m)	0.200
Ratio R	0.394	Maximum Backdrop Height (m)	1.500
Maximum Rainfall (mm/hr)	50	Min Design Depth for Optimisation (m)	1.200
Maximum Time of Concentration (mins)	30	Min Vel for Auto Design only (m/s)	1.00
Foul Sewage (l/s/ha)	0.000	Min Slope for Optimisation (1:X)	500
Volumetric Runoff Coeff.	0.750		

Designed with Level Soffits

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)
1.000	11.460	0.150	76.4	0.015	5.00	0.0	0.600	o	100
1.001	23.430	0.240	97.6	0.005	0.00	0.0	0.600	o	150
2.000	8.950	0.300	29.8	0.009	5.00	0.0	0.600	o	100
2.001	9.550	0.390	24.5	0.009	0.00	0.0	0.600	o	100
3.000	25.760	0.300	85.9	0.015	5.00	0.0	0.600	o	100
3.001	7.180	0.340	21.1	0.005	0.00	0.0	0.600	o	100
1.002	12.450	0.620	20.1	0.000	0.00	0.0	0.600	o	150
4.000	14.630	1.000	14.6	0.005	5.00	0.0	0.600	o	100
4.001	3.070	0.310	9.9	0.006	0.00	0.0	0.600	o	100

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)
1.000	50.00	5.22	111.550	0.015	0.0	0.0	0.6	0.88	6.9	2.6
1.001	50.00	5.60	111.350	0.020	0.0	0.0	0.8	1.02	18.0	3.5
2.000	50.00	5.11	111.850	0.009	0.0	0.0	0.4	1.42	11.1	1.6
2.001	50.00	5.21	111.550	0.018	0.0	0.0	0.7	1.57	12.3	3.2
3.000	50.00	5.52	111.800	0.015	0.0	0.0	0.6	0.83	6.5	2.6
3.001	50.00	5.59	111.500	0.020	0.0	0.0	0.8	1.69	13.3	3.5
1.002	50.00	5.69	111.110	0.058	0.0	0.0	2.4	2.26	39.9	10.2
4.000	50.00	5.12	111.850	0.005	0.0	0.0	0.2	2.03	15.9	0.9
4.001	50.00	5.14	110.850	0.011	0.0	0.0	0.4	2.47	19.4	1.9

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)
1.003	2.000	0.020	100.0	0.000	0.00	0.0	0.600	o	150

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)
1.003	50.00	5.73	110.490	0.069	0.0	0.0	2.8	1.00	17.8	12.1

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.840	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	30.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
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	0	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)	20.000	Storm Duration (mins)	30
Ratio R	0.394		

Storage Structures for Storm

Cellular Storage Manhole: 10, DS/PN: 1.003

Invert Level (m) 110.540 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00792 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00792

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	75.0	75.0	0.801	0.0	103.0
0.800	75.0	103.0			

Summary of Results for 30 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 75.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	111.658	0.008	0.000	1.04		6.7	SURCHARGED
1.001	2	111.428	-0.072	0.000	0.52		8.9	OK
2.000	3	111.894	-0.056	0.000	0.39		4.1	OK
2.001	4	111.613	-0.037	0.000	0.71		8.2	OK
3.000	5	111.928	0.028	0.000	1.04		6.6	SURCHARGED
3.001	6	111.564	-0.036	0.000	0.73		8.8	OK
1.002	7	111.204	-0.056	0.000	0.71		25.8	OK
4.000	8	111.876	-0.074	0.000	0.15		2.3	OK
4.001	9	110.889	-0.061	0.000	0.32		5.0	OK
1.003	10	110.684	0.044	0.000	1.54		16.7	SURCHARGED

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.840	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	30.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
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	0	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)	20.000	Storm Duration (mins)	60
Ratio R	0.394		

Summary of Results for 60 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 75.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	111.611	-0.039	0.000	0.69		4.5	OK
1.001	2	111.411	-0.089	0.000	0.35		5.9	OK
2.000	3	111.885	-0.065	0.000	0.26		2.7	OK
2.001	4	111.599	-0.051	0.000	0.47		5.4	OK
3.000	5	111.862	-0.038	0.000	0.70		4.4	OK
3.001	6	111.550	-0.050	0.000	0.49		5.9	OK
1.002	7	111.183	-0.077	0.000	0.47		17.2	OK
4.000	8	111.871	-0.079	0.000	0.10		1.5	OK
4.001	9	110.881	-0.069	0.000	0.21		3.3	OK
1.003	10	110.661	0.021	0.000	1.27		13.8	SURCHARGED

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.840	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	30.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
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	0	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)	20.000	Storm Duration (mins)	120
Ratio R	0.394		

Summary of Results for 120 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 75.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	111.595	-0.055	0.000	0.43		2.8	OK
1.001	2	111.397	-0.103	0.000	0.22		3.7	OK
2.000	3	111.877	-0.073	0.000	0.16		1.7	OK
2.001	4	111.587	-0.063	0.000	0.29		3.3	OK
3.000	5	111.846	-0.054	0.000	0.44		2.8	OK
3.001	6	111.538	-0.062	0.000	0.31		3.7	OK
1.002	7	111.165	-0.095	0.000	0.29		10.7	OK
4.000	8	111.866	-0.084	0.000	0.06		0.9	OK
4.001	9	110.874	-0.076	0.000	0.13		2.0	OK
1.003	10	110.612	-0.028	0.000	1.00		10.8	OK

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.840	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	30.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
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	1
Number of Online Controls	0	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)	20.000	Storm Duration (mins)	240
Ratio R	0.394		

Summary of Results for 240 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 75.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	111.584	-0.066	0.000	0.25		1.6	OK
1.001	2	111.386	-0.114	0.000	0.13		2.2	OK
2.000	3	111.871	-0.079	0.000	0.10		1.0	OK
2.001	4	111.578	-0.072	0.000	0.17		2.0	OK
3.000	5	111.834	-0.066	0.000	0.26		1.6	OK
3.001	6	111.529	-0.071	0.000	0.18		2.2	OK
1.002	7	111.152	-0.108	0.000	0.18		6.4	OK
4.000	8	111.862	-0.088	0.000	0.04		0.5	OK
4.001	9	110.868	-0.082	0.000	0.08		1.2	OK
1.003	10	110.579	-0.061	0.000	0.66		7.1	OK

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.840	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	30.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
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	1
Number of Online Controls	0	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)	20.000	Storm Duration (mins)	360
Ratio R	0.394		

Summary of Results for 360 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 75.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	111.579	-0.071	0.000	0.18		1.2	OK
1.001	2	111.381	-0.119	0.000	0.09		1.6	OK
2.000	3	111.867	-0.083	0.000	0.07		0.7	OK
2.001	4	111.573	-0.077	0.000	0.13		1.4	OK
3.000	5	111.829	-0.071	0.000	0.19		1.2	OK
3.001	6	111.524	-0.076	0.000	0.13		1.6	OK
1.002	7	111.145	-0.115	0.000	0.13		4.6	OK
4.000	8	111.861	-0.089	0.000	0.03		0.4	OK
4.001	9	110.865	-0.085	0.000	0.06		0.9	OK
1.003	10	110.564	-0.076	0.000	0.49		5.3	OK

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.840	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	30.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
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	1
Number of Online Controls	0	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)	20.000	Storm Duration (mins)	600
Ratio R	0.394		

Summary of Results for 600 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 75.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	111.573	-0.077	0.000	0.12		0.8	OK
1.001	2	111.374	-0.126	0.000	0.06		1.1	OK
2.000	3	111.864	-0.086	0.000	0.05		0.5	OK
2.001	4	111.569	-0.081	0.000	0.08		1.0	OK
3.000	5	111.824	-0.076	0.000	0.13		0.8	OK
3.001	6	111.520	-0.080	0.000	0.09		1.1	OK
1.002	7	111.139	-0.121	0.000	0.09		3.1	OK
4.000	8	111.858	-0.092	0.000	0.02		0.3	OK
4.001	9	110.862	-0.088	0.000	0.04		0.6	OK
1.003	10	110.549	-0.091	0.000	0.33		3.6	OK

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes Lanc.mh

FSR Rainfall Model - England and Wales

Return Period (years)	100	Add Flow / Climate Change (%)	30
M5-60 (mm)	20.000	Minimum Backdrop Height (m)	0.200
Ratio R	0.394	Maximum Backdrop Height (m)	1.500
Maximum Rainfall (mm/hr)	50	Min Design Depth for Optimisation (m)	1.200
Maximum Time of Concentration (mins)	30	Min Vel for Auto Design only (m/s)	1.00
Foul Sewage (l/s/ha)	0.000	Min Slope for Optimisation (1:X)	500
Volumetric Runoff Coeff.	0.750		

Designed with Level Soffits

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)
1.000	20.830	0.170	122.5	0.014	5.00	0.0	0.600	o	150
1.001	33.320	0.480	69.4	0.014	0.00	0.0	0.600	o	150
1.002	19.620	0.390	50.3	0.014	0.00	0.0	0.600	o	150
1.003	11.010	0.250	44.0	0.014	0.00	0.0	0.600	o	150
1.004	23.920	0.320	74.8	0.014	0.00	0.0	0.600	o	150
1.005	20.410	0.540	37.8	0.014	0.00	0.0	0.600	o	150
1.006	28.240	0.670	42.1	0.014	0.00	0.0	0.600	o	150
1.007	2.000	0.020	100.0	0.013	0.00	0.0	0.600	o	225
1.008	2.000	0.020	100.0	0.000	0.00	0.0	0.600	o	225

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)
1.000	50.00	5.38	111.620	0.014	0.0	0.0	0.6	0.91	16.0	2.5
1.001	50.00	5.84	111.450	0.028	0.0	0.0	1.1	1.21	21.4	4.9
1.002	50.00	6.07	110.970	0.042	0.0	0.0	1.7	1.42	25.1	7.4
1.003	50.00	6.19	110.580	0.056	0.0	0.0	2.3	1.52	26.9	9.9
1.004	50.00	6.54	110.330	0.070	0.0	0.0	2.8	1.16	20.6	12.3
1.005	50.00	6.74	110.010	0.084	0.0	0.0	3.4	1.64	29.0	14.8
1.006	50.00	7.05	109.470	0.098	0.0	0.0	4.0	1.55	27.5	17.3
1.007	50.00	7.07	108.725	0.111	0.0	0.0	4.5	1.31	52.0	19.5
1.008	50.00	7.10	108.705	0.111	0.0	0.0	4.5	1.31	52.0	19.5

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.840	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	30.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
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	0	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)	20.000	Storm Duration (mins)	30
Ratio R	0.394		

Storage Structures for Storm

Cellular Storage Manhole: 9, DS/PN: 1.008

Invert Level (m) 108.430 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00792 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00792

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	135.0	135.0	0.801	0.0	173.4
0.800	135.0	173.4			

Summary of Results for 30 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 75.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	111.732	-0.038	0.000	0.42		6.3	OK
1.001	2	111.706	0.106	0.000	0.60		12.3	SURCHARGED
1.002	3	111.595	0.475	0.000	0.70		16.6	SURCHARGED
1.003	4	111.451	0.721	0.000	0.84		20.3	SURCHARGED
1.004	5	111.298	0.818	0.000	1.25		24.4	SURCHARGED
1.005	6	110.802	0.642	0.000	1.08		29.5	SURCHARGED
1.006	7	110.170	0.550	0.000	1.32		34.7	SURCHARGED
1.007	8	108.999	0.049	0.000	1.36		39.4	SURCHARGED
1.008	9	108.730	-0.200	0.000	0.03		0.9	OK

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.840	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	30.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
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	0	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)	20.000	Storm Duration (mins)	60
Ratio R	0.394		

Summary of Results for 60 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 75.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	111.674	-0.096	0.000	0.27		4.1	OK
1.001	2	111.517	-0.083	0.000	0.40		8.3	OK
1.002	3	111.048	-0.072	0.000	0.53		12.5	OK
1.003	4	110.673	-0.057	0.000	0.69		16.7	OK
1.004	5	110.536	0.056	0.000	1.06		20.7	SURCHARGED
1.005	6	110.186	0.026	0.000	0.89		24.4	SURCHARGED
1.006	7	109.755	0.135	0.000	1.08		28.3	SURCHARGED
1.007	8	108.971	0.021	0.000	1.11		32.0	SURCHARGED
1.008	9	108.769	-0.161	0.000	0.18		5.2	OK

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.840	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	30.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
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	0	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)	20.000	Storm Duration (mins)	120
Ratio R	0.394		

Summary of Results for 120 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 75.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	111.661	-0.109	0.000	0.17		2.6	OK
1.001	2	111.501	-0.099	0.000	0.25		5.2	OK
1.002	3	111.029	-0.091	0.000	0.33		7.7	OK
1.003	4	110.648	-0.082	0.000	0.43		10.3	OK
1.004	5	110.419	-0.061	0.000	0.66		12.9	OK
1.005	6	110.091	-0.069	0.000	0.57		15.5	OK
1.006	7	109.562	-0.058	0.000	0.69		18.1	OK
1.007	8	108.865	-0.085	0.000	0.71		20.5	OK
1.008	9	108.783	-0.147	0.000	0.26		7.6	OK

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.840	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	30.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
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	1
Number of Online Controls	0	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)	20.000	Storm Duration (mins)	240
Ratio R	0.394		

Summary of Results for 240 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 75.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	111.652	-0.118	0.000	0.10		1.5	OK
1.001	2	111.488	-0.112	0.000	0.15		3.1	OK
1.002	3	111.015	-0.105	0.000	0.20		4.6	OK
1.003	4	110.631	-0.099	0.000	0.25		6.2	OK
1.004	5	110.395	-0.085	0.000	0.39		7.7	OK
1.005	6	110.070	-0.090	0.000	0.34		9.2	OK
1.006	7	109.537	-0.083	0.000	0.41		10.8	OK
1.007	8	108.827	-0.123	0.000	0.42		12.2	OK
1.008	9	108.782	-0.148	0.000	0.26		7.4	OK

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.840	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	30.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
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	1
Number of Online Controls	0	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)	20.000	Storm Duration (mins)	360
Ratio R	0.394		

Summary of Results for 360 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 75.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	111.647	-0.123	0.000	0.07		1.1	OK
1.001	2	111.483	-0.117	0.000	0.11		2.2	OK
1.002	3	111.007	-0.113	0.000	0.14		3.4	OK
1.003	4	110.623	-0.107	0.000	0.19		4.5	OK
1.004	5	110.385	-0.095	0.000	0.29		5.6	OK
1.005	6	110.060	-0.100	0.000	0.25		6.7	OK
1.006	7	109.526	-0.094	0.000	0.30		7.8	OK
1.007	8	108.810	-0.140	0.000	0.31		8.9	OK
1.008	9	108.776	-0.154	0.000	0.22		6.4	OK

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.840	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	30.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
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	1
Number of Online Controls	0	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)	20.000	Storm Duration (mins)	600
Ratio R	0.394		

Summary of Results for 600 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 75.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	111.641	-0.129	0.000	0.05		0.7	OK
1.001	2	111.477	-0.123	0.000	0.07		1.5	OK
1.002	3	111.001	-0.119	0.000	0.10		2.2	OK
1.003	4	110.615	-0.115	0.000	0.12		3.0	OK
1.004	5	110.374	-0.106	0.000	0.19		3.7	OK
1.005	6	110.050	-0.110	0.000	0.16		4.5	OK
1.006	7	109.515	-0.105	0.000	0.20		5.2	OK
1.007	8	108.794	-0.156	0.000	0.21		5.9	OK
1.008	9	108.767	-0.163	0.000	0.17		4.9	OK