

Patrick Parsons Ltd		Page 1
5 Waverley Road Huddersfield West Yorkshire, HD1 5NA	N16417 Saunderson Road SW Calculations Revision 05	
Date May 2018 File PENISTONE SW-R5.MDX	Designed by TB Checked by	
XP Solutions	Network 2016.1	

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales

Return Period (years)	2	Add Flow / Climate Change (%)	0
M5-60 (mm)	19.300	Minimum Backdrop Height (m)	0.000
Ratio R	0.311	Maximum Backdrop Height (m)	0.000
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

Time Area Diagram for Storm

Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.256	4-8	0.148

Total Area Contributing (ha) = 0.404

Total Pipe Volume (m³) = 291.680

Network Design Table for Storm

- Indicates pipe length does not match coordinates
« - Indicates pipe capacity < flow

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.000	5.400#	0.035	154.3	0.054	5.00	0.0	0.600	o	225	Pipe/Conduit	
1.001	31.700#	0.050	634.0	0.014	0.00	0.0	0.600	[]	-9	Pipe/Conduit	
2.000	3.600#	0.025	144.0	0.043	5.00	0.0	0.600	o	225	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.000	50.00	5.09	200.160	0.054	0.0	0.0	0.0	1.05	41.8	7.3
1.001	50.00	5.44	199.550	0.068	0.0	0.0	0.0	1.48	2383.8	9.2
2.000	50.00	5.06	200.150	0.043	0.0	0.0	0.0	1.09	43.2	5.8

Patrick Parsons Ltd		Page 2
5 Waverley Road Huddersfield West Yorkshire, HD1 5NA	N16417 Saunderson Road SW Calculations Revision 05	
Date May 2018 File PENISTONE SW-R5.MDX	Designed by TB Checked by	
XP Solutions Network 2016.1		

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)	Section Type	Auto Design
2.001	29.000#	0.050	580.0	0.016	0.00	0.0	0.600	[]	-9	Pipe/Conduit	
3.000	5.500	0.080	68.8	0.024	5.00	0.0	0.600	o	150	Pipe/Conduit	
1.002	32.200	0.050	644.0	0.005	0.00	0.0	0.600	[]	-9	Pipe/Conduit	
4.000	5.400#	0.140	38.6	0.004	5.00	0.0	0.600	o	150	Pipe/Conduit	
4.001	31.700#	0.050	634.0	0.027	0.00	0.0	0.600	[]	-9	Pipe/Conduit	
1.003	23.900#	0.350	68.3	0.042	0.00	0.0	0.600	[]	-9	Pipe/Conduit	
5.000	5.100	0.055	92.7	0.042	5.00	0.0	0.600	o	150	Pipe/Conduit	
6.000	5.100	0.060	85.0	0.031	5.00	0.0	0.600	o	150	Pipe/Conduit	
1.004	31.200#	0.100	312.0	0.000	0.00	0.0	0.600	[]	-9	Pipe/Conduit	
1.005	2.500	0.050	50.0	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
7.000	5.000	0.150	33.3	0.102	5.00	0.0	0.600	o	300	Pipe/Conduit	
1.006	5.200	0.055	94.5	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
1.007	28.900	0.470	61.5	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
2.001	50.00	5.37	199.550	0.059	0.0	0.0	0.0	1.55	2493.3	8.0
3.000	50.00	5.08	200.200	0.024	0.0	0.0	0.0	1.21	21.5	3.2
1.002	50.00	5.81	199.500	0.156	0.0	0.0	0.0	1.47	2365.1	21.1
4.000	50.00	5.06	200.250	0.004	0.0	0.0	0.0	1.63	28.7	0.5
4.001	50.00	5.41	199.500	0.031	0.0	0.0	0.0	1.48	2383.8	4.2
1.003	50.00	5.90	199.450	0.229	0.0	0.0	0.0	4.53	7305.8	31.0
5.000	50.00	5.08	199.800	0.042	0.0	0.0	0.0	1.04	18.4	5.7
6.000	50.00	5.08	199.720	0.031	0.0	0.0	0.0	1.09	19.3	4.2
1.004	50.00	6.14	199.100	0.302	0.0	0.0	0.0	2.11	3406.8	40.9
1.005	50.00	6.16	199.000	0.302	0.0	0.0	0.0	2.88	458.1	40.9
7.000	50.00	5.03	199.250	0.102	0.0	0.0	0.0	2.73	193.2	13.8
1.006	50.00	6.24	198.900	0.404	0.0	0.0	0.0	1.03	18.3<	54.7
1.007	50.00	6.62	198.845	0.404	0.0	0.0	0.0	1.28	22.7<	54.7

Patrick Parsons Ltd		Page 3
5 Waverley Road Huddersfield West Yorkshire, HD1 5NA	N16417 Saunderson Road SW Calculations Revision 05	
Date May 2018 File PENISTONE SW-R5.MDX	Designed by TB Checked by	
XP Solutions Network 2016.1		

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall C. Level Name (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1.007	S1 199.475	198.375	197.330	1200	0

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	10.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	0.000
Hot Start (mins)	0	Inlet Coefficient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1

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

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	2	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.100	Storm Duration (mins)	30
Ratio R	0.322		

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Patrick Parsons Ltd		Page 4
5 Waverley Road Huddersfield West Yorkshire, HD1 5NA	N16417 Saunderson Road SW Calculations Revision 05	
Date May 2018 File PENISTONE SW-R5.MDX	Designed by TB Checked by	
XP Solutions	Network 2016.1	

Online Controls for Storm

Hydro-Brake Optimum® Manhole: S3, DS/PN: 1.006, Volume (m³): 6.8

Unit Reference	MD-SHE-0082-3500-1500-3500
Design Head (m)	1.500
Design Flow (l/s)	3.5
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	82
Invert Level (m)	198.900
Minimum Outlet Pipe Diameter (mm)	100
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.500	3.5
Flush-Flo™	0.359	3.1
Kick-Flo®	0.730	2.5
Mean Flow over Head Range	-	2.9

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

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.4	1.200	3.2	3.000	4.8	7.000	7.2
0.200	2.9	1.400	3.4	3.500	5.2	7.500	7.4
0.300	3.1	1.600	3.6	4.000	5.5	8.000	7.7
0.400	3.1	1.800	3.8	4.500	5.8	8.500	7.9
0.500	3.1	2.000	4.0	5.000	6.1	9.000	8.1
0.600	2.9	2.200	4.2	5.500	6.4	9.500	8.3
0.800	2.6	2.400	4.3	6.000	6.7		
1.000	2.9	2.600	4.5	6.500	6.9		

Patrick Parsons Ltd		Page 12
5 Waverley Road Huddersfield West Yorkshire, HD1 5NA	N16417 Saunderson Road SW Calculations Revision 05	
Date May 2018 File PENISTONE SW-R5.MDX	Designed by TB Checked by	
XP Solutions Network 2016.1		

Summary Wizard of 480 minute 100 year Summer I+40% for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	10.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	0.000
Hot Start Level (mm)	0	Inlet Coefficient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

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

Synthetic Rainfall Details

Rainfall Model	FSR	Ratio R	0.311
Region	England and Wales	Cv (Summer)	0.750
M5-60 (mm)		Cv (Winter)	0.840

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

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

PN	US/MH Name	Storm Rank	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Pipe Flow / Overflow Cap. (l/s)	Pipe Flow (l/s)	Status
1.000	S8A	20	200.229	-0.156	0.000	0.20	6.1	OK
1.001	S8	9	200.186	-0.164	0.000	0.00	7.6	OK
2.000	S7B	20	200.212	-0.163	0.000	0.17	4.9	OK
2.001	S7A	9	200.186	-0.164	0.000	0.00	6.6	OK
3.000	S6C	20	200.239	-0.111	0.000	0.15	2.7	OK
1.002	S7	9	200.186	-0.114	0.000	0.00	6.6	OK
4.000	S6B	19	200.264	-0.136	0.000	0.02	0.5	OK
4.001	S6A	9	200.187	-0.113	0.000	0.00	3.4	OK
1.003	S6	9	200.187	-0.063	0.000	0.00	12.8	OK
5.000	S4B	9	200.196	0.246	0.000	0.32	4.8	SURCHARGED
6.000	S4A	9	200.196	0.326	0.000	0.23	3.5	SURCHARGED
1.004	S5	9	200.195	0.295	0.000	0.00	7.6	SURCHARGED
1.005	S4	9	200.196	0.746	0.000	0.04	6.5	SURCHARGED
7.000	S3A	9	200.198	0.648	0.000	0.12	11.5	SURCHARGED
1.006	S3	9	200.197	1.147	0.000	0.22	3.3	SURCHARGED
1.007	S2	9	198.884	-0.111	0.000	0.15	3.2	OK

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Patrick Parsons Ltd		Page 13
5 Waverley Road Huddersfield West Yorkshire, HD1 5NA	N16417 Saunderson Road SW Calculations Revision 05	
Date May 2018 File PENISTONE SW-R5.MDX	Designed by TB Checked by	
XP Solutions Network 2016.1		

Summary Wizard of 600 minute 100 year Summer I+40% for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	10.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	0.000
Hot Start Level (mm)	0	Inlet Coefficient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

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

Synthetic Rainfall Details

Rainfall Model	FSR	Ratio R	0.311
Region	England and Wales	Cv (Summer)	0.750
M5-60 (mm)		19.300 Cv (Winter)	0.840

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

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

PN	US/MH Name	Storm Rank	Water	Surcharged	Flooded	Flow / Cap.	Overflow	Pipe	Status
			Level (m)	Depth (m)	Volume (m³)		(l/s)	Flow (l/s)	
1.000	S8A	21	200.223	-0.162	0.000	0.17		5.2	OK
1.001	S8	10	200.181	-0.169	0.000	0.00		6.4	OK
2.000	S7B	21	200.206	-0.169	0.000	0.14		4.1	OK
2.001	S7A	10	200.181	-0.169	0.000	0.00		5.6	OK
3.000	S6C	21	200.236	-0.114	0.000	0.13		2.3	OK
1.002	S7	10	200.181	-0.119	0.000	0.00		5.9	OK
4.000	S6B	21	200.262	-0.138	0.000	0.02		0.4	OK
4.001	S6A	10	200.182	-0.118	0.000	0.00		2.9	OK
1.003	S6	10	200.182	-0.068	0.000	0.00		13.1	OK
5.000	S4B	10	200.191	0.241	0.000	0.27		4.0	SURCHARGED
6.000	S4A	10	200.191	0.321	0.000	0.19		3.0	SURCHARGED
1.004	S5	10	200.189	0.289	0.000	0.00		7.8	SURCHARGED
1.005	S4	10	200.191	0.741	0.000	0.04		6.6	SURCHARGED
7.000	S3A	10	200.194	0.644	0.000	0.10		9.7	SURCHARGED
1.006	S3	10	200.193	1.143	0.000	0.22		3.2	SURCHARGED
1.007	S2	10	198.883	-0.112	0.000	0.15		3.2	OK

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Patrick Parsons Ltd		Page 14
5 Waverley Road Huddersfield West Yorkshire, HD1 5NA	N16417 Saunderson Road SW Calculations Revision 05	
Date May 2018 File PENISTONE SW-R5.MDX	Designed by TB Checked by	
XP Solutions Network 2016.1		

Summary Wizard of 720 minute 100 year Summer I+40% for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	10.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	0.000
Hot Start Level (mm)	0	Inlet Coefficient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

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

Synthetic Rainfall Details

Rainfall Model	FSR	Ratio R	0.311
Region England and Wales Cv (Summer)	0.750		
M5-60 (mm)	19.300	Cv (Winter)	0.840

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

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

PN	US/MH Name	Storm Rank	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Pipe Flow / Overflow Cap. (l/s)	Pipe Flow (l/s)	Status
1.000	S8A	22	200.218	-0.167	0.000	0.15	4.5	OK
1.001	S8	12	200.169	-0.181	0.000	0.00	5.6	OK
2.000	S7B	22	200.202	-0.173	0.000	0.12	3.6	OK
2.001	S7A	12	200.169	-0.181	0.000	0.00	4.9	OK
3.000	S6C	22	200.234	-0.116	0.000	0.11	2.0	OK
1.002	S7	12	200.169	-0.131	0.000	0.00	5.4	OK
4.000	S6B	22	200.260	-0.140	0.000	0.01	0.3	OK
4.001	S6A	12	200.170	-0.130	0.000	0.00	2.5	OK
1.003	S6	12	200.170	-0.080	0.000	0.00	12.8	OK
5.000	S4B	12	200.181	0.231	0.000	0.24	3.5	SURCHARGED
6.000	S4A	12	200.181	0.311	0.000	0.17	2.6	SURCHARGED
1.004	S5	12	200.179	0.279	0.000	0.00	7.8	SURCHARGED
1.005	S4	12	200.181	0.731	0.000	0.04	6.4	SURCHARGED
7.000	S3A	12	200.184	0.634	0.000	0.09	8.5	SURCHARGED
1.006	S3	12	200.184	1.134	0.000	0.22	3.2	SURCHARGED
1.007	S2	12	198.883	-0.112	0.000	0.15	3.2	OK

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Patrick Parsons Ltd		Page 16
5 Waverley Road Huddersfield West Yorkshire, HD1 5NA	N16417 Saunderson Road SW Calculations Revision 05	
Date May 2018 File PENISTONE SW-R5.MDX	Designed by TB Checked by	
XP Solutions Network 2016.1		

Summary Wizard of 1440 minute 100 year Summer I+40% for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	10.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	0.000
Hot Start Level (mm)	0	Inlet Coefficient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

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

Synthetic Rainfall Details

Rainfall Model	FSR	Ratio R	0.311
Region England and Wales Cv (Summer)	0.750		
M5-60 (mm)	19.300	Cv (Winter)	0.840

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

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

				Water	Surcharged	Flooded		Pipe	
PN	US/MH Name	Storm Rank	Level (m)	Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)	Flow (l/s)	Status
1.000	S8A	24	200.205	-0.180	0.000	0.09		2.7	OK
1.001	S8	16	200.107	-0.243	0.000	0.00		3.3	OK
2.000	S7B	24	200.190	-0.185	0.000	0.07		2.1	OK
2.001	S7A	16	200.107	-0.243	0.000	0.00		2.9	OK
3.000	S6C	24	200.225	-0.125	0.000	0.07		1.2	OK
1.002	S7	16	200.107	-0.193	0.000	0.00		4.2	OK
4.000	S6B	24	200.256	-0.144	0.000	0.01		0.2	OK
4.001	S6A	16	200.107	-0.193	0.000	0.00		1.5	OK
1.003	S6	16	200.107	-0.143	0.000	0.00		5.7	OK
5.000	S4B	16	200.109	0.159	0.000	0.14		2.1	SURCHARGED
6.000	S4A	16	200.109	0.239	0.000	0.10		1.5	SURCHARGED
1.004	S5	16	200.108	0.208	0.000	0.00		5.0	SURCHARGED
1.005	S4	16	200.108	0.658	0.000	0.02		3.1	SURCHARGED
7.000	S3A	16	200.109	0.559	0.000	0.05		5.1	SURCHARGED
1.006	S3	16	200.108	1.058	0.000	0.22		3.2	SURCHARGED
1.007	S2	16	198.883	-0.112	0.000	0.15		3.2	OK

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Patrick Parsons Ltd		Page 20
5 Waverley Road Huddersfield West Yorkshire, HD1 5NA	N16417 Saunderson Road SW Calculations Revision 05	
Date May 2018 File PENISTONE SW-R5.MDX	Designed by TB Checked by	
XP Solutions Network 2016.1		

Summary Wizard of 120 minute 100 year Winter I+40% for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	10.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	0.000
Hot Start Level (mm)	0	Inlet Coefficient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

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

Synthetic Rainfall Details

Rainfall Model	FSR	Ratio R	0.311
Region England and Wales Cv (Summer)	0.750		
M5-60 (mm)	19.300	Cv (Winter)	0.840

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

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

PN	US/MH Name	Storm Rank	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Pipe Flow / Overflow Cap. (l/s)	Pipe Flow (l/s)	Status
1.000	S8A	16	200.259	-0.126	0.000	0.40	12.0	OK
1.001	S8	14	200.138	-0.212	0.000	0.01	14.8	OK
2.000	S7B	16	200.239	-0.136	0.000	0.33	9.5	OK
2.001	S7A	14	200.138	-0.212	0.000	0.01	12.8	OK
3.000	S6C	16	200.256	-0.094	0.000	0.30	5.3	OK
1.002	S7	14	200.138	-0.162	0.000	0.01	16.0	OK
4.000	S6B	15	200.269	-0.131	0.000	0.04	0.9	OK
4.001	S6A	14	200.139	-0.161	0.000	0.00	6.6	OK
1.003	S6	14	200.139	-0.111	0.000	0.01	17.9	OK
5.000	S4B	14	200.152	0.202	0.000	0.63	9.3	SURCHARGED
6.000	S4A	14	200.151	0.281	0.000	0.45	6.9	SURCHARGED
1.004	S5	15	200.148	0.248	0.000	0.01	12.3	SURCHARGED
1.005	S4	15	200.150	0.700	0.000	0.03	5.3	SURCHARGED
7.000	S3A	14	200.158	0.608	0.000	0.23	22.5	SURCHARGED
1.006	S3	14	200.156	1.106	0.000	0.22	3.2	SURCHARGED
1.007	S2	15	198.883	-0.112	0.000	0.15	3.2	OK

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Patrick Parsons Ltd		Page 21
5 Waverley Road Huddersfield West Yorkshire, HD1 5NA	N16417 Saunderson Road SW Calculations Revision 05	
Date May 2018 File PENISTONE SW-R5.MDX	Designed by TB Checked by	
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Summary Wizard of 180 minute 100 year Winter I+40% for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	10.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	0.000
Hot Start Level (mm)	0	Inlet Coefficient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

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

Synthetic Rainfall Details

Rainfall Model	FSR	Ratio R	0.311
Region England and Wales Cv (Summer)	0.750		
M5-60 (mm)	19.300	Cv (Winter)	0.840

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

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

PN	US/MH Name	Storm Rank	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Pipe Flow / Overflow Cap. (l/s)	Pipe Flow (l/s)	Status
1.000	S8A	18	200.244	-0.141	0.000	0.30	9.0	OK
1.001	S8	8	200.220	-0.130	0.000	0.01	11.2	OK
2.000	S7B	18	200.226	-0.149	0.000	0.25	7.2	OK
2.001	S7A	8	200.220	-0.130	0.000	0.01	9.7	OK
3.000	S6C	18	200.248	-0.102	0.000	0.23	4.0	OK
1.002	S7	8	200.220	-0.080	0.000	0.01	11.4	OK
4.000	S6B	17	200.267	-0.133	0.000	0.03	0.7	OK
4.001	S6A	8	200.220	-0.080	0.000	0.00	5.0	OK
1.003	S6	8	200.220	-0.030	0.000	0.00	13.1	OK
5.000	S4B	8	200.224	0.274	0.000	0.48	7.0	SURCHARGED
6.000	S4A	8	200.224	0.354	0.000	0.33	5.1	FLOOD RISK
1.004	S5	8	200.223	0.323	0.000	0.00	9.3	SURCHARGED
1.005	S4	8	200.223	0.773	0.000	0.04	6.6	SURCHARGED
7.000	S3A	8	200.225	0.675	0.000	0.17	17.0	SURCHARGED
1.006	S3	8	200.224	1.174	0.000	0.22	3.3	SURCHARGED
1.007	S2	8	198.884	-0.111	0.000	0.15	3.3	OK

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Patrick Parsons Ltd		Page 23
5 Waverley Road Huddersfield West Yorkshire, HD1 5NA	N16417 Saunderson Road SW Calculations Revision 05	
Date May 2018 File PENISTONE SW-R5.MDX	Designed by TB Checked by	
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Summary Wizard of 360 minute 100 year Winter I+40% for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	10.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	0.000
Hot Start Level (mm)	0	Inlet Coefficient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

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

Synthetic Rainfall Details

Rainfall Model	FSR	Ratio R	0.311
Region England and Wales Cv (Summer)	0.750		
M5-60 (mm)	19.300	Cv (Winter)	0.840

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

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

PN	US/MH Name	Storm Rank	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Pipe Flow / Overflow Cap. (l/s)	Pipe Flow (l/s)	Status
1.000	S8A	6	200.366	-0.019	0.000	0.18	5.5	OK
1.001	S8	4	200.367	0.017	0.000	0.00	6.8	SURCHARGED
2.000	S7B	4	200.367	-0.008	0.000	0.15	4.4	OK
2.001	S7A	4	200.367	0.017	0.000	0.00	5.8	SURCHARGED
3.000	S6C	4	200.368	0.018	0.000	0.14	2.4	SURCHARGED
1.002	S7	4	200.367	0.067	0.000	0.01	20.4	SURCHARGED
4.000	S6B	4	200.365	-0.035	0.000	0.02	0.4	OK
4.001	S6A	4	200.369	0.069	0.000	0.00	3.0	SURCHARGED
1.003	S6	4	200.369	0.119	0.000	0.01	34.2	SURCHARGED
5.000	S4B	4	200.389	0.439	0.000	0.29	4.3	SURCHARGED
6.000	S4A	4	200.388	0.518	0.000	0.20	3.1	FLOOD RISK
1.004	S5	4	200.390	0.490	0.000	0.01	22.3	SURCHARGED
1.005	S4	4	200.401	0.951	0.000	0.10	16.6	SURCHARGED
7.000	S3A	4	200.400	0.850	0.000	0.11	10.3	FLOOD RISK
1.006	S3	4	200.396	1.346	0.000	0.23	3.4	SURCHARGED
1.007	S2	4	198.885	-0.110	0.000	0.16	3.4	OK

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Patrick Parsons Ltd		Page 25
5 Waverley Road Huddersfield West Yorkshire, HD1 5NA	N16417 Saunderson Road SW Calculations Revision 05	
Date May 2018 File PENISTONE SW-R5.MDX	Designed by TB Checked by	
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Summary Wizard of 600 minute 100 year Winter I+40% for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	10.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	0.000
Hot Start Level (mm)	0	Inlet Coefficient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

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

Synthetic Rainfall Details

Rainfall Model	FSR	Ratio R	0.311
Region England and Wales Cv (Summer)	0.750		
M5-60 (mm)	19.300	Cv (Winter)	0.840

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

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

PN	US/MH Name	Storm Rank	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Pipe Flow / Overflow Cap. (l/s)	Pipe Flow (l/s)	Status
1.000	S8A	1	200.439	0.054	0.000	0.13	3.8	SURCHARGED
1.001	S8	1	200.437	0.087	0.000	0.00	4.6	SURCHARGED
2.000	S7B	1	200.439	0.064	0.000	0.10	3.0	SURCHARGED
2.001	S7A	1	200.438	0.088	0.000	0.00	4.0	SURCHARGED
3.000	S6C	1	200.439	0.089	0.000	0.09	1.7	SURCHARGED
1.002	S7	1	200.438	0.138	0.000	0.01	20.7	SURCHARGED
4.000	S6B	1	200.438	0.038	0.000	0.01	0.3	SURCHARGED
4.001	S6A	1	200.437	0.137	0.000	0.00	2.1	SURCHARGED
1.003	S6	1	200.437	0.187	0.000	0.01	34.7	SURCHARGED
5.000	S4B	1	200.440	0.490	0.000	0.20	2.9	SURCHARGED
6.000	S4A	1	200.440	0.570	0.000	0.14	2.1	FLOOD RISK
1.004	S5	1	200.437	0.537	0.000	0.01	20.4	SURCHARGED
1.005	S4	1	200.439	0.989	0.000	0.10	16.6	SURCHARGED
7.000	S3A	1	200.446	0.896	0.000	0.07	7.0	FLOOD RISK
1.006	S3	1	200.444	1.394	0.000	0.24	3.5	SURCHARGED
1.007	S2	1	198.885	-0.110	0.000	0.16	3.5	OK

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Patrick Parsons Ltd		Page 26
5 Waverley Road Huddersfield West Yorkshire, HD1 5NA	N16417 Saunderson Road SW Calculations Revision 05	
Date May 2018 File PENISTONE SW-R5.MDX	Designed by TB Checked by	
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Summary Wizard of 720 minute 100 year Winter I+40% for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	10.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	0.000
Hot Start Level (mm)	0	Inlet Coefficient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

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

Synthetic Rainfall Details

Rainfall Model	FSR	Ratio R	0.311
Region	England and Wales	Cv (Summer)	0.750
M5-60 (mm)	19.300	Cv (Winter)	0.840

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

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

			Water Level	Surcharged Depth	Flooded Volume	Pipe Flow / Overflow	Pipe Flow	
PN	US/MH Name	Storm Rank	(m)	(m)	(m³)	Cap. (l/s)	(l/s)	Status
1.000	S8A	3	200.395	0.010	0.000	0.11	3.3	SURCHARGED
1.001	S8	3	200.396	0.046	0.000	0.00	4.1	SURCHARGED
2.000	S7B	3	200.396	0.021	0.000	0.09	2.6	SURCHARGED
2.001	S7A	3	200.396	0.046	0.000	0.00	3.5	SURCHARGED
3.000	S6C	3	200.395	0.045	0.000	0.08	1.5	SURCHARGED
1.002	S7	3	200.396	0.096	0.000	0.01	23.3	SURCHARGED
4.000	S6B	3	200.398	-0.002	0.000	0.01	0.2	OK
4.001	S6A	3	200.398	0.098	0.000	0.00	1.8	SURCHARGED
1.003	S6	3	200.398	0.148	0.000	0.01	33.6	SURCHARGED
5.000	S4B	3	200.407	0.457	0.000	0.17	2.5	SURCHARGED
6.000	S4A	3	200.406	0.536	0.000	0.12	1.9	FLOOD RISK
1.004	S5	3	200.404	0.504	0.000	0.01	21.7	SURCHARGED
1.005	S4	3	200.407	0.957	0.000	0.10	16.1	SURCHARGED
7.000	S3A	3	200.421	0.871	0.000	0.06	6.1	FLOOD RISK
1.006	S3	3	200.417	1.367	0.000	0.24	3.5	SURCHARGED
1.007	S2	3	198.885	-0.110	0.000	0.16	3.5	OK

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Patrick Parsons Ltd		Page 28
5 Waverley Road Huddersfield West Yorkshire, HD1 5NA	N16417 Saunderson Road SW Calculations Revision 05	
Date May 2018 File PENISTONE SW-R5.MDX	Designed by TB Checked by	
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Summary Wizard of 1440 minute 100 year Winter I+40% for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	10.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	0.000
Hot Start Level (mm)	0	Inlet Coefficient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

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

Synthetic Rainfall Details

Rainfall Model	FSR	Ratio R	0.311
Region England and Wales Cv (Summer)	0.750		
M5-60 (mm)	19.300	Cv (Winter)	0.840

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

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

PN	US/MH Name	Storm Rank	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Pipe Flow / Overflow Cap. (l/s)	Pipe Flow (l/s)	Status
1.000	S8A	15	200.260	-0.125	0.000	0.07	1.9	OK
1.001	S8	7	200.259	-0.091	0.000	0.00	2.4	OK
2.000	S7B	13	200.260	-0.115	0.000	0.05	1.5	OK
2.001	S7A	7	200.259	-0.091	0.000	0.00	2.1	OK
3.000	S6C	14	200.260	-0.090	0.000	0.05	0.9	OK
1.002	S7	7	200.259	-0.041	0.000	0.00	3.6	OK
4.000	S6B	20	200.262	-0.138	0.000	0.01	0.1	OK
4.001	S6A	7	200.265	-0.035	0.000	0.00	1.1	OK
1.003	S6	7	200.265	0.015	0.000	0.01	27.0	SURCHARGED
5.000	S4B	7	200.280	0.330	0.000	0.10	1.5	SURCHARGED
6.000	S4A	7	200.280	0.410	0.000	0.07	1.1	FLOOD RISK
1.004	S5	7	200.279	0.379	0.000	0.01	13.6	SURCHARGED
1.005	S4	7	200.284	0.834	0.000	0.06	10.8	SURCHARGED
7.000	S3A	7	200.299	0.749	0.000	0.04	3.7	SURCHARGED
1.006	S3	7	200.297	1.247	0.000	0.23	3.3	SURCHARGED
1.007	S2	7	198.884	-0.111	0.000	0.15	3.3	OK

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