





















AMEC Foster Wheeler Group Ltd		Page 1
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Date 25/06/2019 File 20190606_Grangetown_Sites_V9.mdx		
XP Solutions		STDC Grangetown Prairie Network Results Designed by Ben Silk Checked by Ian Wilson Network 2018.1.1

STORM SEWER DESIGN by the Modified Rational Method


Network Design Table for Grangetown Prairie

« - Indicates pipe capacity < flow

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	n	HYD SECT	DIA (mm)	Section	Type	Auto Design
S1.000	164.452	2.349	70.0	0.222	1.00	0.0	0.018	1.5	\	500	1:1.5	Ditch	
S1.001	67.805	0.111	610.9	0.239	0.00	0.0	0.018	1.5	\	500	1:1.5	Ditch	
S1.002	142.298	0.490	290.4	0.230	0.00	0.0	0.018	1.5	\	500	1:1.5	Ditch	
S1.003	72.294	0.145	500.0	0.192	0.00	0.0	0.018	1.5	\	500	1:1.5	Ditch	
S1.004	72.294	0.128	564.8	0.171	0.00	0.0	0.018	1.5	\	500	1:1.5	Ditch	
S2.000	112.264	0.561	200.1	0.194	1.00	0.0	0.018	1.5	\	500	1:1.5	Ditch	
S2.001	66.788	0.639	104.5	0.135	0.00	0.0	0.018	1.5	\	500	1:1.5	Ditch	
S1.005	26.742	0.053	500.0	0.120	0.00	0.0	0.018	1.5	\	500	1:1.5	Ditch	
S3.000	115.394	0.017	6787.9	0.170	1.00	0.0	0.018	1.5	\	500	1:1.5	Ditch	
S3.001	68.347	0.185	369.4	0.153	0.00	0.0	0.018	1.5	\	500	1:1.5	Ditch	
S1.006	123.766	0.248	500.0	0.146	0.00	0.0	0.018	1.5	\	500	1:1.5	Ditch	
S1.007	55.199	0.110	500.0	0.153	0.00	0.0	0.018	1.5	\	500	1:1.5	Ditch	
S1.008	55.199	0.184	300.0	0.127	0.00	0.0	0.018	1.5	\	500	1:1.5	Ditch	
S1.009	69.149	0.138	500.0	0.133	0.00	0.0	0.018	1.5	\	500	1:1.5	Ditch	
S4.000	107.010	1.385	77.3	0.144	1.00	0.0	0.018	1.5	\	500	1:1.5	Ditch	
S1.010	60.927	0.122	499.4	0.144	0.00	0.0	0.018	1.5	\	500	1:1.5	Ditch	
S5.000	41.186	0.240	171.6	0.302	1.00	0.0	0.018	1.5	\	500	1:1.5	Ditch	
S5.001	181.119	0.362	500.3	0.000	0.00	0.0	0.018	1.5	\	500	1:1.5	Ditch	
S5.002	84.065	0.168	500.4	0.453	0.00	0.0	0.018	1.5	\	500	1:1.5	Ditch	











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)
S1.000	250.00	2.29	10.000	0.222	0.0	0.0	0.0	2.12	603.7	120.1
S1.001	181.02	3.87	7.651	0.461	0.0	0.0	0.0	0.72	204.4	180.6
S1.002	131.28	6.15	7.540	0.690	0.0	0.0	0.0	1.04	296.4	196.3
S1.003	112.64	7.67	7.050	0.882	0.0	0.0	0.0	0.79	225.9	215.3
S1.004	98.65	9.29	6.905	1.053	0.0	0.0	0.0	0.75	212.5«	225.0
S2.000	245.53	2.49	8.050	0.194	0.0	0.0	0.0	1.25	357.1	103.1
S2.001	203.64	3.27	7.489	0.329	0.0	0.0	0.0	1.44	248.4	145.0
S1.005	94.71	9.85	6.777	1.502	0.0	0.0	0.0	0.79	225.9«	308.1
S3.000	94.10	9.94	7.500	0.170	0.0	0.0	0.0	0.22	61.3	34.6
S3.001	86.35	11.25	7.483	0.323	0.0	0.0	0.0	0.87	208.5	60.4
S1.006	74.75	13.86	6.742	1.970	0.0	0.0	0.0	0.79	225.9«	319.0
S1.007	70.69	15.02	6.494	2.123	0.0	0.0	0.0	0.79	225.9«	325.2
S1.008	67.90	15.92	6.384	2.250	0.0	0.0	0.0	1.02	291.6«	331.1
S1.009	63.90	17.37	6.200	2.384	0.0	0.0	0.0	0.79	225.9«	331.1
S4.000	250.00	1.88	7.735	0.144	0.0	0.0	0.0	2.02	574.6	77.9
S1.010	60.83	18.65	6.062	2.672	0.0	0.0	0.0	0.79	226.0«	352.1
S5.000	250.00	1.51	8.590	0.302	0.0	0.0	0.0	1.35	385.6	163.5
S5.001	145.22	5.32	8.350	0.302	0.0	0.0	0.0	0.79	225.8	163.5
S5.002	119.01	7.09	7.988	0.755	0.0	0.0	0.0	0.79	225.8	194.6

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STORM SEWER DESIGN by the Modified Rational Method

Network Design Table for Grangetown Prairie

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	n	HYD SECT	DIA (mm)	Section Type	Auto Design
S5.003	84.065	0.235	357.7	0.753	0.00	0.0		0.018	1.5 \_/\	500	1:1.5 Ditch	
S6.000	183.060	0.183	1000.3	0.221	1.00	0.0		0.018	1.5 \_/\	500	1:1.5 Ditch	
S6.001	94.460	0.094	1000.0	0.489	0.00	0.0		0.018	1.5 \_/\	500	1:1.5 Ditch	
S6.002	94.460	0.094	1004.9	0.697	0.00	0.0		0.018	1.5 \_/\	500	1:1.5 Ditch	
S6.003	46.006	0.046	1000.1	0.841	0.00	0.0		0.018	1.5 \_/\	500	1:1.5 Ditch	
S6.004	186.631	0.322	579.6	0.000	0.00	0.0		0.018	1.5 \_/\	500	1:1.5 Ditch	
S5.004	36.625	0.750	48.8	0.758	0.00	0.0	0.600		1.5 \_/\	500	1:1.5 Ditch	
S1.011	85.374	0.285	299.6	0.000	0.00	0.0	0.600		o 450		Pipe/Conduit	
S1.012	103.963	0.347	299.6	0.000	0.00	0.0	0.600		o 450		Pipe/Conduit	
S1.013	96.862	0.323	299.9	0.000	0.00	0.0	0.600		o 375		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)
S5.003	104.21	8.58	7.820	1.508	0.0	0.0	0.0	0.94	267.1«	340.4
S6.000	127.09	6.44	8.290	0.221	0.0	0.0	0.0	0.56	159.7	60.8
S6.001	98.89	9.25	8.107	0.710	0.0	0.0	0.0	0.56	159.7	152.1
S6.002	82.25	12.07	8.012	1.407	0.0	0.0	0.0	0.56	159.3«	250.8
S6.003	76.35	13.44	7.918	2.248	0.0	0.0	0.0	0.56	159.7«	371.8
S6.004	63.17	17.66	7.872	2.248	0.0	0.0	0.0	0.74	209.8«	371.8
S5.004	62.78	17.82	7.550	4.513	0.0	0.0	0.0	3.91	1115.1	613.9
S1.011	58.22	19.87	5.000	7.185	0.0	0.0	0.0	1.17	186.0«	906.3
S1.012	55.39	21.35	4.715	7.185	0.0	0.0	0.0	1.17	186.0«	906.3
S1.013	52.76	22.90	4.368	7.185	0.0	0.0	0.0	1.04	115.0«	906.3

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Area Summary for Grangetown Prairie

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	User	-	100	0.222	0.222	0.222
1.001	User	-	100	0.239	0.239	0.239
1.002	User	-	100	0.230	0.230	0.230
1.003	User	-	100	0.192	0.192	0.192
1.004	User	-	100	0.171	0.171	0.171
2.000	User	-	100	0.194	0.194	0.194
2.001	User	-	100	0.135	0.135	0.135
1.005	User	-	100	0.120	0.120	0.120
3.000	User	-	100	0.170	0.170	0.170
3.001	User	-	100	0.153	0.153	0.153
1.006	User	-	100	0.146	0.146	0.146
1.007	User	-	100	0.153	0.153	0.153
1.008	User	-	100	0.127	0.127	0.127
1.009	User	-	100	0.133	0.133	0.133
4.000	User	-	100	0.144	0.144	0.144
1.010	User	-	100	0.144	0.144	0.144
5.000	User	-	100	0.302	0.302	0.302
5.001	-	-	100	0.000	0.000	0.000
5.002	User	-	100	0.453	0.453	0.453
5.003	User	-	100	0.753	0.753	0.753
6.000	User	-	100	0.221	0.221	0.221
6.001	User	-	100	0.489	0.489	0.489
6.002	User	-	100	0.697	0.697	0.697
6.003	User	-	100	0.841	0.841	0.841
6.004	-	-	100	0.000	0.000	0.000
5.004	User	-	100	0.758	0.758	0.758
1.011	-	-	100	0.000	0.000	0.000
1.012	-	-	100	0.000	0.000	0.000
1.013	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				7.185	7.185	7.185

Free Flowing Outfall Details for Grangetown Prairie

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D, L (mm)	W (mm)
S1.013	S	8.441	4.045	1.800	0	0


Simulation Criteria for Grangetown Prairie

Volumetric Runoff Coeff	0.600	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m <sup>3</sup> /ha Storage	2.000
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 Offline Controls 0    Number of Time/Area Diagrams 0  
Number of Online Controls 1    Number of Storage Structures 1    Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FEH	E (1km)	0.283
Return Period (years)	30	F (1km)	2.340
FEH Rainfall Version	1999	Summer Storms	Yes
Site Location	GB 454100 523250 NZ 54100 23250	Winter Storms	Yes
C (1km)	-0.022	Cv (Summer)	0.600
D1 (1km)	0.381	Cv (Winter)	0.840
D2 (1km)	0.379	Storm Duration (mins)	30
D3 (1km)	0.256		

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Online Controls for Grangetown Prairie


Hydro-Brake® Optimum Manhole: S10, DS/PN: S1.011, Volume (m³): 100.2

Unit Reference	MD-SHE-0439-1309-1160-1309
Design Head (m)	1.160
Design Flow (l/s)	130.9
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	439
Invert Level (m)	5.000
Minimum Outlet Pipe Diameter (mm)	500
Suggested Manhole Diameter (mm)	Site Specific Design (Contact Hydro International)

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.160	130.9	Kick-Flo®	0.969	119.9
Flush-Flo™	0.617	130.7	Mean Flow over Head Range	-	100.5

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

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	11.7	0.800	127.9	2.000	170.7	4.000	239.6	7.000	315.4
0.200	42.3	1.000	121.8	2.200	178.8	4.500	253.9	7.500	326.3
0.300	83.6	1.200	133.1	2.400	186.6	5.000	267.3	8.000	336.8
0.400	123.6	1.400	143.4	2.600	194.0	5.500	280.1	8.500	347.0
0.500	129.3	1.600	153.1	3.000	208.1	6.000	292.4	9.000	356.9
0.600	130.7	1.800	162.1	3.500	224.4	6.500	304.1	9.500	366.5


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Storage Structures for Grangetown Prairie

Infiltration Basin Manhole: S10, DS/PN: S1.011

Invert Level (m)      5.000    Safety Factor    2.0  
 Infiltration Coefficient Base (m/hr)    0.00000      Porosity    1.00  
 Infiltration Coefficient Side (m/hr)    0.00000

Depth (m)	Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )
0.000	1829.8	1.000	1829.8

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1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Grangetown Prairie

Simulation Criteria

Areal Reduction Factor 1.000      Additional Flow - % of Total Flow 0.000  
Hot Start (mins) 0      MADD Factor \* 10m<sup>3</sup>/ha Storage 2.000  
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 Offline Controls 0      Number of Time/Area Diagrams 0  
Number of Online Controls 1      Number of Storage Structures 1      Number of Real Time Controls 0


Synthetic Rainfall Details

Rainfall Model      FEH      D3 (1km) 0.256  
FEH Rainfall Version      1999      E (1km) 0.283  
Site Location GB 454100 523250 NZ 54100 23250      F (1km) 2.340  
C (1km)      -0.022      Cv (Summer) 0.600  
D1 (1km)      0.381      Cv (Winter) 0.600  
D2 (1km)      0.379

Margin for Flood Risk Warning (mm) 0.0      DVD Status ON  
Analysis Timestep Fine      Inertia Status ON  
DTS Status OFF


Profile(s)      Summer and Winter  
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960,  
1440  
Return Period(s) (years) 1, 30, 100  
Climate Change (%) 0, 0, 20

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surchage	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)
S1.000	S1	15 Summer	1	+0%					10.059	-0.341
S1.001	S2	15 Summer	1	+0%					7.774	-0.431
S1.002	S3	15 Summer	1	+0%					7.652	-0.588
S1.003	S4	30 Summer	1	+0%					7.198	-0.552
S1.004	S5	30 Summer	1	+0%					7.078	-0.770
S2.000	S5	15 Summer	1	+0%					8.124	-0.326
S2.001	S6	15 Summer	1	+0%					7.553	-0.147
S1.005	S5	30 Summer	1	+0%					6.970	-0.580
S3.000	S8	15 Summer	1	+0%					7.616	-0.284
S3.001	S9	30 Summer	1	+0%					7.552	-0.198
S1.006	S6	30 Summer	1	+0%					6.924	-1.074
S1.007	S7	30 Summer	1	+0%					6.691	-1.229
S1.008	S13	30 Summer	1	+0%					6.552	-1.198
S1.009	S8	30 Summer	1	+0%					6.393	-0.357
S4.000	S11	15 Summer	1	+0%					7.783	-0.352
S1.010	S9	30 Summer	1	+0%					6.256	-0.494
S5.000	S15	15 Summer	1	+0%					8.681	-0.309
S5.001	S16	15 Summer	1	+0%					8.461	-0.289
S5.002	S17	15 Summer	1	+0%					8.122	-0.628
S5.003	S20	15 Summer	1	+0%					7.983	-0.754
S6.000	S18	15 Summer	1	+0%					8.415	-0.575
S6.001	S19	30 Summer	1	+0%					8.285	-0.965
S6.002	S22	30 Summer	1	+0%					8.242	-1.008
S6.003	S20	30 Summer	1	+0%					8.166	-1.084
S6.004	S21	30 Summer	1	+0%					8.063	-1.137
S5.004	S18	30 Summer	1	+0%					7.667	-0.583
S1.011	S10	360 Summer	1	+0%	30/60 Summer				5.258	-0.192
S1.012	S11	360 Summer	1	+0%					4.904	-0.261
S1.013	S12	360 Summer	1	+0%	30/60 Summer				4.576	-0.167

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1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Grangetown Prairie

PN	US/MH Name	Flooded		Pipe		Level Exceeded
		Volume (m <sup>3</sup> )	Flow / Overflow Cap. (l/s)	Flow (l/s)	Status	
S1.000	S1	0.000	0.02	23.8	OK	
S1.001	S2	0.000	0.05	34.6	OK	
S1.002	S3	0.000	0.02	44.5	OK	
S1.003	S4	0.000	0.04	49.7	OK	
S1.004	S5	0.000	0.02	54.0	OK	
S2.000	S5	0.000	0.03	21.2	OK	
S2.001	S6	0.000	0.11	27.2	OK	
S1.005	S5	0.000	0.04	70.1	OK	
S3.000	S8	0.000	0.06	16.0	OK	
S3.001	S9	0.000	0.08	17.4	OK	
S1.006	S6	0.000	0.02	90.0	OK	
S1.007	S7	0.000	0.01	92.6	OK	
S1.008	S13	0.000	0.01	94.7	OK	
S1.009	S8	0.000	0.12	95.9	OK	
S4.000	S11	0.000	0.02	19.5	OK	
S1.010	S9	0.000	0.08	94.0	OK	
S5.000	S15	0.000	0.05	36.0	OK	
S5.001	S16	0.000	0.05	21.2	OK	
S5.002	S17	0.000	0.03	42.9	OK	
S5.003	S20	0.000	0.03	85.1	OK	
S6.000	S18	0.000	0.02	15.9	OK	
S6.001	S19	0.000	0.01	29.0	OK	
S6.002	S22	0.000	0.02	58.9	OK	
S6.003	S20	0.000	0.02	94.0	OK	
S6.004	S21	0.000	0.02	93.7	OK	
S5.004	S18	0.000	0.06	200.1	OK	
S1.011	S10	0.000	0.37	65.6	OK	
S1.012	S11	0.000	0.37	65.7	OK	
S1.013	S12	0.000	0.59	65.6	OK	

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

Simulation Criteria

Areal Reduction Factor 1.000      Additional Flow - % of Total Flow 0.000  
Hot Start (mins) 0      MADD Factor \* 10m<sup>3</sup>/ha Storage 2.000  
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 Offline Controls 0      Number of Time/Area Diagrams 0  
Number of Online Controls 1      Number of Storage Structures 1      Number of Real Time Controls 0

Synthetic Rainfall Details


Rainfall Model      FEH      D3 (1km) 0.256  
FEH Rainfall Version      1999      E (1km) 0.283  
Site Location GB 454100 523250 NZ 54100 23250      F (1km) 2.340  
C (1km)      -0.022      Cv (Summer) 0.600  
D1 (1km)      0.381      Cv (Winter) 0.600  
D2 (1km)      0.379

Margin for Flood Risk Warning (mm) 0.0      DVD Status ON  
Analysis Timestep Fine      Inertia Status ON  
DTS Status OFF

Profile(s)      Summer and Winter  
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960,  
1440  
Return Period(s) (years) 1, 30, 100  
Climate Change (%) 0, 0, 20


PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)
S1.000	S1	15 Summer	30	+0%					10.110	-0.290
S1.001	S2	15 Summer	30	+0%					7.890	-0.315
S1.002	S3	15 Summer	30	+0%					7.761	-0.479
S1.003	S4	15 Summer	30	+0%					7.327	-0.423
S1.004	S5	15 Summer	30	+0%					7.214	-0.634
S2.000	S5	15 Summer	30	+0%					8.187	-0.263
S2.001	S6	15 Summer	30	+0%					7.613	-0.087
S1.005	S5	15 Summer	30	+0%					7.109	-0.441
S3.000	S8	15 Summer	30	+0%					7.703	-0.197
S3.001	S9	15 Summer	30	+0%					7.622	-0.128
S1.006	S6	15 Summer	30	+0%					7.063	-0.935
S1.007	S7	30 Summer	30	+0%					6.825	-1.095
S1.008	S13	30 Summer	30	+0%					6.677	-1.073
S1.009	S8	30 Summer	30	+0%					6.524	-0.226
S4.000	S11	15 Summer	30	+0%					7.824	-0.311
S1.010	S9	30 Summer	30	+0%					6.396	-0.354
S5.000	S15	15 Summer	30	+0%					8.757	-0.233
S5.001	S16	15 Summer	30	+0%					8.549	-0.201
S5.002	S17	15 Summer	30	+0%					8.249	-0.501
S5.003	S20	15 Summer	30	+0%					8.115	-0.622
S6.000	S18	15 Summer	30	+0%					8.516	-0.474
S6.001	S19	15 Summer	30	+0%					8.426	-0.824
S6.002	S22	15 Summer	30	+0%					8.396	-0.854
S6.003	S20	15 Summer	30	+0%					8.321	-0.929
S6.004	S21	15 Summer	30	+0%					8.201	-0.999
S5.004	S18	15 Summer	30	+0%					7.760	-0.490
S1.011	S10	240 Summer	30	+0%	30/60 Summer				5.569	0.119
S1.012	S11	240 Summer	30	+0%					4.995	-0.170
S1.013	S12	240 Summer	30	+0%	30/60 Summer				4.816	0.073



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XP Solutions	Network 2018.1.1	

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

PN	US/MH Name	Flooded		Pipe	Status	Level Exceeded
		Volume (m <sup>3</sup> )	Flow / Overflow Cap. (l/s)	Flow (l/s)		
S1.000	S1	0.000	0.06	69.7	OK	
S1.001	S2	0.000	0.15	113.7	OK	
S1.002	S3	0.000	0.08	147.0	OK	
S1.003	S4	0.000	0.11	156.5	OK	
S1.004	S5	0.000	0.06	162.5	OK	
S2.000	S5	0.000	0.09	58.4	OK	
S2.001	S6	0.000	0.35	86.0	OK	
S1.005	S5	0.000	0.12	201.6	OK	
S3.000	S8	0.000	0.13	38.2	OK	
S3.001	S9	0.000	0.29	59.7	OK	
S1.006	S6	0.000	0.05	259.5	OK	
S1.007	S7	0.000	0.04	256.4	OK	
S1.008	S13	0.000	0.03	260.3	OK	
S1.009	S8	0.000	0.33	261.0	OK	
S4.000	S11	0.000	0.05	56.6	OK	
S1.010	S9	0.000	0.23	262.7	OK	
S5.000	S15	0.000	0.15	104.5	OK	
S5.001	S16	0.000	0.15	61.0	OK	
S5.002	S17	0.000	0.08	137.4	OK	
S5.003	S20	0.000	0.09	255.1	OK	
S6.000	S18	0.000	0.05	44.6	OK	
S6.001	S19	0.000	0.03	77.2	OK	
S6.002	S22	0.000	0.05	162.3	OK	
S6.003	S20	0.000	0.06	262.4	OK	
S6.004	S21	0.000	0.04	247.8	OK	
S5.004	S18	0.000	0.17	555.7	OK	
S1.011	S10	0.000	0.71	125.2	SURCHARGED	
S1.012	S11	0.000	0.71	125.2	OK	
S1.013	S12	0.000	1.13	125.0	SURCHARGED	

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XP Solutions	Network 2018.1.1	

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

Simulation Criteria

Areal Reduction Factor 1.000      Additional Flow - % of Total Flow 0.000  
Hot Start (mins) 0      MADD Factor \* 10m<sup>3</sup>/ha Storage 2.000  
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 Offline Controls 0      Number of Time/Area Diagrams 0  
Number of Online Controls 1      Number of Storage Structures 1      Number of Real Time Controls 0


Synthetic Rainfall Details

Rainfall Model      FEH      D3 (1km) 0.256  
FEH Rainfall Version      1999      E (1km) 0.283  
Site Location GB 454100 523250 NZ 54100 23250      F (1km) 2.340  
C (1km)      -0.022      Cv (Summer) 0.600  
D1 (1km)      0.381      Cv (Winter) 0.600  
D2 (1km)      0.379

Margin for Flood Risk Warning (mm) 0.0      DVD Status ON  
Analysis Timestep Fine      Inertia Status ON  
DTS Status OFF

Profile(s)      Summer and Winter  
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440  
Return Period(s) (years) 1, 30, 100  
Climate Change (%) 0, 0, 20

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surchage	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)
S1.000	S1	15 Summer	100	+20%					10.151	-0.249
S1.001	S2	15 Summer	100	+20%					7.970	-0.235
S1.002	S3	15 Summer	100	+20%					7.840	-0.400
S1.003	S4	15 Summer	100	+20%					7.423	-0.327
S1.004	S5	15 Summer	100	+20%					7.319	-0.529
S2.000	S5	15 Summer	100	+20%					8.236	-0.214
S2.001	S6	15 Summer	100	+20%					7.659	-0.041
S1.005	S5	15 Summer	100	+20%					7.218	-0.332
S3.000	S8	15 Summer	100	+20%					7.764	-0.136
S3.001	S9	15 Summer	100	+20%					7.677	-0.073
S1.006	S6	15 Summer	100	+20%					7.172	-0.826
S1.007	S7	15 Summer	100	+20%					6.932	-0.988
S1.008	S13	15 Summer	100	+20%					6.775	-0.975
S1.009	S8	30 Summer	100	+20%					6.627	-0.123
S4.000	S11	15 Summer	100	+20%					7.857	-0.278
S1.010	S9	30 Summer	100	+20%					6.504	-0.246
S5.000	S15	15 Summer	100	+20%					8.815	-0.175
S5.001	S16	15 Summer	100	+20%					8.614	-0.136
S5.002	S17	15 Summer	100	+20%					8.337	-0.413
S5.003	S20	15 Summer	100	+20%					8.209	-0.528
S6.000	S18	15 Summer	100	+20%					8.591	-0.399
S6.001	S19	15 Summer	100	+20%					8.540	-0.709
S6.002	S22	15 Summer	100	+20%					8.514	-0.736
S6.003	S20	15 Summer	100	+20%					8.438	-0.812
S6.004	S21	15 Summer	100	+20%					8.311	-0.889
S5.004	S18	15 Summer	100	+20%					7.833	-0.417
S1.011	S10	240 Summer	100	+20%	30/60 Summer				6.017	0.567
S1.012	S11	720 Summer	100	+20%					5.041	-0.124
S1.013	S12	600 Winter	100	+20%	30/60 Summer				4.853	0.110

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

PN	US/MH Name	Flooded		Pipe	Status	Level Exceeded
		Volume (m <sup>3</sup> )	Flow / Overflow Cap. (l/s)	Flow (l/s)		
S1.000	S1	0.000	0.11	122.6	OK	
S1.001	S2	0.000	0.27	201.7	OK	
S1.002	S3	0.000	0.15	262.1	OK	
S1.003	S4	0.000	0.20	275.6	OK	
S1.004	S5	0.000	0.11	287.4	OK	
S2.000	S5	0.000	0.16	103.3	OK	
S2.001	S6	0.000	0.62	153.2	OK	
S1.005	S5	0.000	0.21	361.5	OK	
S3.000	S8	0.000	0.23	67.5	OK	
S3.001	S9	0.000	0.53	111.2	OK	
S1.006	S6	0.000	0.09	465.7	OK	
S1.007	S7	0.000	0.06	457.7	OK	
S1.008	S13	0.000	0.06	460.3	OK	
S1.009	S8	0.000	0.57	452.7	OK	
S4.000	S11	0.000	0.10	99.3	OK	
S1.010	S9	0.000	0.40	460.5	OK	
S5.000	S15	0.000	0.26	181.5	OK	
S5.001	S16	0.000	0.27	107.8	OK	
S5.002	S17	0.000	0.14	237.8	OK	
S5.003	S20	0.000	0.15	448.3	OK	
S6.000	S18	0.000	0.08	77.8	OK	
S6.001	S19	0.000	0.04	129.9	OK	
S6.002	S22	0.000	0.08	285.7	OK	
S6.003	S20	0.000	0.11	467.1	OK	
S6.004	S21	0.000	0.08	439.4	OK	
S5.004	S18	0.000	0.30	988.2	OK	
S1.011	S10	0.000	0.74	130.5	SURCHARGED	
S1.012	S11	0.000	0.74	130.5	OK	
S1.013	S12	0.000	1.18	130.5	SURCHARGED	