

Appendix D

Preliminary Calculations

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Jonsen House 43 Commercial Road Poole BH14 0HU	Hayling island JB-3216	
Date April 16	Designed by MJR	
File JB-3216 Design Prelim 211-s.MDX	Checked by	
XP Solutions	Network 2015.1	

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)	19.000	Minimum Backdrop Height (m)	0.500
Ratio R	0.350	Maximum Backdrop Height (m)	1.500
Maximum Rainfall (mm/hr)	50	Min Design Depth for Optimisation (m)	0.500
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	0.158	4-8	0.036

Total Area Contributing (ha) = 0.194

Total Pipe Volume (m³) = 2.852

Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	Pipe Out PN Invert Level (m)	Diameter (mm)	Pipes In PN Invert Level (m)	Diameter (mm)	Backdrop (mm)
1	7.000	0.600	Open Manhole		1.000	6.400	100		
2	7.000	0.720	Junction		1.001	6.280	100	1.000	6.280
3	7.000	0.861	Junction	0	1.002	6.139	100	1.001	6.139
4	7.000	0.963	Open Manhole		1.003	6.037	100	1.002	6.037
5	7.000	1.161	Junction	0	1.004	5.839	100	1.003	5.839
6	7.000	1.287	Open Manhole	450	1.005	5.713	100	1.004	5.713
7	7.000	0.600	Open Manhole		2.000	6.400	100		
9	7.000	0.687	Junction	0	2.001	6.313	100	2.000	6.313
7	7.000	1.406	Open Manhole	450	1.006	5.594	150	1.005	5.644
							2.001	6.287	100
8	7.000	0.600	Open Manhole		3.000	6.400	100		
9	7.000	0.632	Junction		3.001	6.368	100	3.000	6.368
10	7.000	0.701	Junction	0	3.002	6.299	100	3.001	6.299
11	7.000	0.600	Open Manhole	450	4.000	6.400	100		
8	7.000	1.796	Open Manhole	450	1.007	5.204	150	1.006	5.204
							3.002	6.278	100
							4.000	6.330	100
15	7.000	0.600	Open Manhole	300	5.000	6.400	100		
16	7.000	0.919	Open Manhole		5.001	6.081	100	5.000	6.081
17	7.000	1.087	Junction	0	5.002	5.913	100	5.001	5.913
18	7.000	1.198	Open Manhole		5.003	5.802	150	5.002	5.852
19	7.000	1.282	Junction	0	5.004	5.718	150	5.003	5.718
20	7.000	1.367	Open Manhole	450	5.005	5.633	150	5.004	5.633
21	7.000	1.489	Open Manhole	450	5.006	5.511	150	5.005	5.511
22	7.000	1.602	Open Manhole	450	5.007	5.398	150	5.006	5.398
23	6.800	1.529	Open Manhole	1200	5.008	5.271	150	5.007	5.271
9	6.800	1.794	Open Manhole	1200	1.008	5.006	225	1.007	5.081
							5.008	5.081	150
10	7.000	2.048	Open Manhole	1200	1.009	4.952	225	1.008	4.952
	7.000	2.070	Open Manhole	0		OUTFALL		1.009	4.930
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PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	o	100	1	7.000	6.400	0.500	Open Manhole	300
1.001	o	100	2	7.000	6.280	0.620	Junction	
1.002	o	100	3	7.000	6.139	0.761	Junction	
1.003	o	100	4	7.000	6.037	0.863	Open Manhole	450
1.004	o	100	5	7.000	5.839	1.061	Junction	
1.005	o	100	6	7.000	5.713	1.187	Open Manhole	450
2.000	o	100	7	7.000	6.400	0.500	Open Manhole	300
2.001	o	100	9	7.000	6.313	0.587	Junction	
1.006	o	150	7	7.000	5.594	1.256	Open Manhole	450
3.000	o	100	8	7.000	6.400	0.500	Open Manhole	300
3.001	o	100	9	7.000	6.368	0.532	Junction	
3.002	o	100	10	7.000	6.299	0.601	Junction	
4.000	o	100	11	7.000	6.400	0.500	Open Manhole	450
1.007	o	150	8	7.000	5.204	1.646	Open Manhole	450
5.000	o	100	15	7.000	6.400	0.500	Open Manhole	300
5.001	o	100	16	7.000	6.081	0.819	Open Manhole	450
5.002	o	100	17	7.000	5.913	0.987	Junction	
5.003	o	150	18	7.000	5.802	1.048	Open Manhole	450
5.004	o	150	19	7.000	5.718	1.132	Junction	
5.005	o	150	20	7.000	5.633	1.217	Open Manhole	450

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	7.012	58.5	2	7.000	6.280	0.620	Junction	
1.001	8.268	58.5	3	7.000	6.139	0.761	Junction	
1.002	5.961	58.5	4	7.000	6.037	0.863	Open Manhole	450
1.003	11.584	58.5	5	7.000	5.839	1.061	Junction	
1.004	7.361	58.5	6	7.000	5.713	1.187	Open Manhole	450
1.005	4.036	58.5	7	7.000	5.644	1.256	Open Manhole	450
2.000	5.072	58.5	9	7.000	6.313	0.587	Junction	
2.001	1.566	58.5	7	7.000	6.287	0.613	Open Manhole	450
1.006	22.780	58.5	8	7.000	5.204	1.646	Open Manhole	450
3.000	1.895	58.5	9	7.000	6.368	0.532	Junction	
3.001	4.032	58.5	10	7.000	6.299	0.601	Junction	
3.002	1.234	58.5	8	7.000	6.278	0.622	Open Manhole	450
4.000	4.112	58.5	8	7.000	6.330	0.570	Open Manhole	450
1.007	12.268	99.2	9	6.800	5.081	1.569	Open Manhole	1200
5.000	18.634	58.5	16	7.000	6.081	0.819	Open Manhole	450
5.001	9.868	58.5	17	7.000	5.913	0.987	Junction	
5.002	3.530	58.5	18	7.000	5.852	1.048	Open Manhole	450
5.003	4.927	58.5	19	7.000	5.718	1.132	Junction	
5.004	8.460	99.7	20	7.000	5.633	1.217	Open Manhole	450
5.005	12.144	99.7	21	7.000	5.511	1.339	Open Manhole	450

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PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
5.006	o	150	21	7.000	5.511	1.339	Open Manhole	450
5.007	o	150	22	7.000	5.398	1.452	Open Manhole	450
5.008	o	150	23	6.800	5.271	1.379	Open Manhole	1200
1.008	o	225	9	6.800	5.006	1.569	Open Manhole	1200
1.009	o	225	10	7.000	4.952	1.823	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
5.006	11.347	99.7	22	7.000	5.398	1.452	Open Manhole	450
5.007	12.647	99.7	23	6.800	5.271	1.379	Open Manhole	1200
5.008	6.320	33.2	9	6.800	5.081	1.569	Open Manhole	1200
1.008	9.043	168.2	10	7.000	4.952	1.823	Open Manhole	1200
1.009	3.686	168.2		7.000	4.930	1.845	Open Manhole	0

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Area Summary for Storm

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	User	-	100	0.003	0.003	0.003
	User	-	100	0.001	0.001	0.004
1.001	User	-	100	0.004	0.004	0.004
	User	-	100	0.009	0.009	0.012
1.002	User	-	100	0.004	0.004	0.004
1.003	User	-	100	0.002	0.002	0.002
1.004	User	-	100	0.004	0.004	0.004
	User	-	100	0.006	0.006	0.010
	User	-	100	0.003	0.003	0.013
1.005	User	-	100	0.004	0.004	0.004
2.000	User	-	100	0.003	0.003	0.003
	User	-	100	0.002	0.002	0.005
2.001	User	-	100	0.004	0.004	0.004
	User	-	100	0.001	0.001	0.006
1.006	-	-	100	0.000	0.000	0.000
3.000	User	-	100	0.006	0.006	0.006
3.001	User	-	100	0.006	0.006	0.006
	User	-	100	0.002	0.002	0.009
3.002	User	-	100	0.002	0.002	0.002
4.000	User	-	100	0.007	0.007	0.007
	User	-	100	0.009	0.009	0.016
1.007	-	-	100	0.000	0.000	0.000
5.000	User	-	100	0.006	0.006	0.006
5.001	User	-	100	0.004	0.004	0.004
	User	-	100	0.000	0.000	0.004
5.002	User	-	100	0.008	0.008	0.008
	User	-	100	0.001	0.001	0.010
	User	-	100	0.004	0.004	0.014
5.003	User	-	100	0.005	0.005	0.005
	User	-	100	0.005	0.005	0.010
5.004	User	-	100	0.004	0.004	0.004
	User	-	100	0.004	0.004	0.007
5.005	User	-	100	0.008	0.008	0.008
	User	-	100	0.004	0.004	0.012
5.006	User	-	100	0.004	0.004	0.004
5.007	User	-	100	0.003	0.003	0.003
	User	-	100	0.002	0.002	0.004
5.008	User	-	100	0.040	0.040	0.040
1.008	User	-	100	0.011	0.011	0.011
1.009	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				0.194	0.194	0.194

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1.009		7.000	4.930	0.000	0	0

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Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m ³ /ha Storage	2.000
Hot Start (mins)	0	Inlet Coeffiecient	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 Online Controls	1	Number of Storage Structures	1
		Number of Time/Area Diagrams	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)	19.000	Storm Duration (mins)	30
Ratio R	0.350		

Online Controls for Storm

Pump Manhole: 10, DS/PN: 1.009, Volume (m³): 2.6

Invert Level (m) 4.952

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.200	5.0000	1.400	21.0000	2.600	21.0000	3.800	21.0000	5.000	21.0000
0.400	10.0000	1.600	21.0000	2.800	21.0000	4.000	21.0000	5.200	21.0000
0.600	21.0000	1.800	21.0000	3.000	21.0000	4.200	21.0000	5.400	21.0000
0.800	21.0000	2.000	21.0000	3.200	21.0000	4.400	21.0000	5.600	21.0000
1.000	21.0000	2.200	21.0000	3.400	21.0000	4.600	21.0000	5.800	21.0000
1.200	21.0000	2.400	21.0000	3.600	21.0000	4.800	21.0000	6.000	21.0000

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Storage Structures for Storm

Cellular Storage Manhole: 10, DS/PN: 1.009

Invert Level (m) 4.952 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	25.0	0.0	1.800	0.0	0.0	3.600	0.0	0.0
0.200	25.0	0.0	2.000	0.0	0.0	3.800	0.0	0.0
0.400	25.0	0.0	2.200	0.0	0.0	4.000	0.0	0.0
0.600	25.0	0.0	2.400	0.0	0.0	4.200	0.0	0.0
0.800	25.0	0.0	2.600	0.0	0.0	4.400	0.0	0.0
1.000	0.0	0.0	2.800	0.0	0.0	4.600	0.0	0.0
1.200	0.0	0.0	3.000	0.0	0.0	4.800	0.0	0.0
1.400	0.0	0.0	3.200	0.0	0.0	5.000	0.0	0.0
1.600	0.0	0.0	3.400	0.0	0.0			

Volume Summary (Static)

Length Calculations based on Centre-Centre

Storage			
Pipe	USMH	Structure	Total
Number	Name	Volume (m³)	Volume (m³)
1.000	1	0.000	0.000
1.001	2	0.000	0.000
1.002	3	0.000	0.000
1.003	4	0.000	0.000
1.004	5	0.000	0.000
1.005	6	0.000	0.000
2.000	7	0.000	0.000
2.001	9	0.000	0.000
1.006	7	0.000	0.000
3.000	8	0.000	0.000
3.001	9	0.000	0.000
3.002	10	0.000	0.000
4.000	11	0.000	0.000
1.007	8	0.000	0.000
5.000	15	0.000	0.000
5.001	16	0.000	0.000
5.002	17	0.000	0.000
5.003	18	0.000	0.000
5.004	19	0.000	0.000
5.005	20	0.000	0.000
5.006	21	0.000	0.000
5.007	22	0.000	0.000
5.008	23	0.000	0.000
1.008	9	0.000	0.000
1.009	10	20.583	20.583
Total		20.583	20.583

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

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
 Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
 Hot Start Level (mm) 0 Inlet Coeffiecient 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 FSR M5-60 (mm) 19.000 Cv (Summer) 0.750
 Region England and Wales Ratio R 0.350 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
 Analysis Timestep Fine Inertia Status OFF
 DTS Status ON

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

			Water Surcharged Flooded				Pipe			
US/MH			US/CL	Level	Depth	Volume	Flow /	Overflow	Maximum	Flow
PN	Name	Event	(m)	(m)	(m)	(m³)	Cap.	(l/s)	Vol (m³)	(l/s)
1.000	1 15 minute	1 year Winter I+0%	7.000	6.418	-0.082	0.000	0.08		0.001	0.5
1.001	2 15 minute	1 year Winter I+0%	7.000	6.313	-0.067	0.000	0.24		0.034	1.9
1.002	3 15 minute	1 year Winter I+0%	7.000	6.175	-0.064	0.000	0.28		0.039	2.3
1.003	4 15 minute	1 year Winter I+0%	7.000	6.076	-0.061	0.000	0.33		0.013	2.4
1.004	5 15 minute	1 year Winter I+0%	7.000	5.888	-0.051	0.000	0.48		0.054	3.8
1.005	6 15 minute	1 year Winter I+0%	7.000	5.771	-0.042	0.000	0.63		0.020	4.2
2.000	7 15 minute	1 year Winter I+0%	7.000	6.422	-0.078	0.000	0.10		0.001	0.7
2.001	9 15 minute	1 year Winter I+0%	7.000	6.350	-0.063	0.000	0.29		0.039	1.3
1.006	7 15 minute	1 year Winter I+0%	7.000	5.645	-0.099	0.000	0.25		0.009	5.5
3.000	8 15 minute	1 year Winter I+0%	7.000	6.426	-0.074	0.000	0.15		0.001	0.8
3.001	9 15 minute	1 year Winter I+0%	7.000	6.400	-0.067	0.000	0.23		0.031	1.7
3.002	10 15 minute	1 year Winter I+0%	7.000	6.347	-0.051	0.000	0.47		0.053	1.9
4.000	11 15 minute	1 year Summer I+0%	7.000	6.438	-0.062	0.000	0.32		0.005	2.1
1.007	8 15 minute	1 year Winter I+0%	7.000	5.287	-0.067	0.000	0.58		0.037	9.4
5.000	15 15 minute	1 year Winter I+0%	7.000	6.421	-0.079	0.000	0.10		0.001	0.8
5.001	16 15 minute	1 year Winter I+0%	7.000	6.108	-0.073	0.000	0.16		0.008	1.2
5.002	17 15 minute	1 year Winter I+0%	7.000	5.957	-0.056	0.000	0.39		0.048	2.7
5.003	18 15 minute	1 year Winter I+0%	7.000	5.849	-0.104	0.000	0.20		0.008	3.7
5.004	19 15 minute	1 year Winter I+0%	7.000	5.769	-0.099	0.000	0.25		0.060	4.5
5.005	20 15 minute	1 year Winter I+0%	7.000	5.695	-0.088	0.000	0.36		0.039	5.8
5.006	21 15 minute	1 year Winter I+0%	7.000	5.576	-0.085	0.000	0.39		0.041	6.2
5.007	22 15 minute	1 year Winter I+0%	7.000	5.464	-0.083	0.000	0.41		0.042	6.6
5.008	23 15 minute	1 year Winter I+0%	6.800	5.338	-0.083	0.000	0.41		0.102	10.8
1.008	9 30 minute	1 year Winter I+0%	6.800	5.270	0.039	0.000	0.52		0.493	17.0
1.009	10 30 minute	1 year Winter I+0%	7.000	5.260	0.083	0.000	0.29		7.977	7.7

US/MH		
PN	Name	Status
1.000	1	OK
1.001	2	OK*
1.002	3	OK*
1.003	4	OK

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

US/MH		
PN	Name	Status
1.004	5	OK*
1.005	6	OK
2.000	7	OK
2.001	9	OK*
1.006	7	OK
3.000	8	OK
3.001	9	OK*
3.002	10	OK*
4.000	11	OK
1.007	8	OK
5.000	15	OK
5.001	16	OK
5.002	17	OK*
5.003	18	OK
5.004	19	OK*
5.005	20	OK
5.006	21	OK
5.007	22	OK
5.008	23	OK
1.008	9	SURCHARGED
1.009	10	SURCHARGED

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

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
 Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
 Hot Start Level (mm) 0 Inlet Coeffiecient 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 FSR M5-60 (mm) 19.000 Cv (Summer) 0.750
 Region England and Wales Ratio R 0.350 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
 Analysis Timestep Fine Inertia Status OFF
 DTS Status ON

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

US/MH		Water Surcharged Flooded							Pipe	
PN	Name	Event	US/CL (m)	Level (m)	Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)	Maximum Vol (m³)	Flow (l/s)
1.000	1 15 minute	30 year Winter I+20%	7.000	6.458	-0.042	0.000	0.22		0.004	1.6
1.001	2 15 minute	30 year Winter I+20%	7.000	6.380	0.000	0.000	0.77		0.209	6.1
1.002	3 30 minute	30 year Winter I+20%	7.000	6.239	0.000	0.000	0.71		0.236	5.6
1.003	4 15 minute	30 year Winter I+20%	7.000	6.380	0.243	0.000	0.81		0.099	6.1
1.004	5 30 minute	30 year Winter I+20%	7.000	5.939	0.000	0.000	1.02		0.462	8.1
1.005	6 15 minute	30 year Winter I+20%	7.000	6.159	0.346	0.000	1.44		0.126	9.7
2.000	7 15 minute	30 year Winter I+20%	7.000	6.438	-0.062	0.000	0.31		0.002	2.1
2.001	9 15 minute	30 year Summer I+20%	7.000	6.391	-0.022	0.000	0.96		0.089	4.4
1.006	7 15 minute	30 year Winter I+20%	7.000	6.028	0.284	0.000	0.60		0.096	13.2
3.000	8 15 minute	30 year Winter I+20%	7.000	6.470	-0.030	0.000	0.44		0.005	2.2
3.001	9 15 minute	30 year Winter I+20%	7.000	6.464	-0.003	0.000	0.74		0.103	5.4
3.002	10 30 minute	30 year Winter I+20%	7.000	6.399	0.000	0.000	1.22		0.122	4.9
4.000	11 15 minute	30 year Winter I+20%	7.000	6.476	-0.024	0.000	0.93		0.011	6.3
1.007	8 30 minute	30 year Winter I+20%	7.000	5.908	0.554	0.000	1.30		0.506	21.0
5.000	15 15 minute	30 year Winter I+20%	7.000	6.437	-0.063	0.000	0.30		0.002	2.3
5.001	16 15 minute	30 year Winter I+20%	7.000	6.227	0.046	0.000	0.51		0.063	3.8
5.002	17 30 minute	30 year Winter I+20%	7.000	6.013	0.000	0.000	1.00		0.286	6.8
5.003	18 15 minute	30 year Winter I+20%	7.000	6.164	0.212	0.000	0.62		0.083	11.3
5.004	19 30 minute	30 year Winter I+20%	7.000	5.868	0.000	0.000	0.60		0.449	10.7
5.005	20 15 minute	30 year Winter I+20%	7.000	6.119	0.336	0.000	0.93		0.222	15.0
5.006	21 15 minute	30 year Winter I+20%	7.000	6.035	0.374	0.000	0.91		0.289	14.6
5.007	22 30 minute	30 year Winter I+20%	7.000	5.948	0.400	0.000	0.83		0.279	13.4
5.008	23 30 minute	30 year Winter I+20%	6.800	5.875	0.454	0.000	0.88		0.887	22.8
1.008	9 30 minute	30 year Winter I+20%	6.800	5.825	0.594	0.000	1.39		1.214	45.4
1.009	10 30 minute	30 year Winter I+20%	7.000	5.798	0.621	0.000	0.78		21.122	21.0

US/MH		
PN	Name	Status
1.000	1	OK
1.001	2	SURCHARGED*
1.002	3	SURCHARGED*
1.003	4	SURCHARGED

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US/MH		
PN	Name	Status
1.004	5	SURCHARGED*
1.005	6	SURCHARGED
2.000	7	OK
2.001	9	OK*
1.006	7	SURCHARGED
3.000	8	OK
3.001	9	OK*
3.002	10	SURCHARGED*
4.000	11	OK
1.007	8	SURCHARGED
5.000	15	OK
5.001	16	SURCHARGED
5.002	17	SURCHARGED*
5.003	18	SURCHARGED
5.004	19	SURCHARGED*
5.005	20	SURCHARGED
5.006	21	SURCHARGED
5.007	22	SURCHARGED
5.008	23	SURCHARGED
1.008	9	SURCHARGED
1.009	10	SURCHARGED

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Jonsen House 43 Commercial Road Poole BH14 0HU	Hayling island JB-3216	
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File JB-3216 Design Prelim 211-s.MDX	Checked by	
XP Solutions	Network 2015.1	

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

Simulation Criteria

Areal Reduction Factor 1.000

Additional Flow - % of Total Flow 0.000

Hot Start (mins) 0

MADD Factor * 10m³/ha Storage 2.000

Hot Start Level (mm) 0

Inlet Coeffiecient 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

FSR M5-60 (mm) 19.000

Cv (Summer) 0.750

Region England and Wales

Ratio R 0.350

Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0

DVD Status OFF

Analysis Timestep

Fine Inertia Status OFF

DTS Status ON

Profile(s)

Summer and Winter

Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440

Return Period(s) (years) 1, 30, 100

Climate Change (%) 0, 20, 30

US/MH						Water Surcharged		Flooded				Pipe
PN	Name	Event	US/CL	Level	Depth	Volume	Flow /	Overflow	Maximum	Flow		
			(m)	(m)	(m)	(m³)	Cap.	(l/s)	Vol (m³)	(l/s)		
1.000	1	30 minute 100 year Winter I+30%	7.000	6.924	0.424	0.000	0.23		0.037	1.6		
1.001	2	30 minute 100 year Winter I+30%	7.000	6.380	0.000	0.000	0.74		0.690	5.9		
1.002	3	120 minute 100 year Winter I+30%	7.000	6.239	0.000	0.000	0.45		0.281	3.6		
1.003	4	30 minute 100 year Winter I+30%	7.000	6.897	0.761	0.000	0.78		0.181	5.8		
1.004	5	120 minute 100 year Winter I+30%	7.000	5.939	0.000	0.000	0.72		0.578	5.7		
1.005	6	30 minute 100 year Winter I+30%	7.000	6.852	1.039	0.000	1.32		0.236	8.9		
2.000	7	30 minute 100 year Winter I+30%	7.000	6.832	0.332	0.000	0.33		0.030	2.3		
2.001	9	30 minute 100 year Winter I+30%	7.000	6.413	0.000	0.000	1.00		0.550	4.6		
1.006	7	30 minute 100 year Winter I+30%	7.000	6.827	1.084	0.000	0.58		0.234	12.7		
3.000	8	30 minute 100 year Winter I+30%	7.000	6.810	0.310	0.000	0.48		0.029	2.4		
3.001	9	30 minute 100 year Winter I+30%	7.000	6.468	0.000	0.000	0.82		0.450	6.0		
3.002	10	30 minute 100 year Winter I+30%	7.000	6.399	0.000	0.000	1.68		0.531	6.8		
4.000	11	30 minute 100 year Winter I+30%	7.000	6.809	0.309	0.000	0.99		0.064	6.7		
1.007	8	30 minute 100 year Winter I+30%	7.000	6.801	1.447	0.000	1.60		0.684	25.8		
5.000	15	30 minute 100 year Winter I+30%	7.000	6.940	0.440	0.000	0.32		0.038	2.4		
5.001	16	30 minute 100 year Winter I+30%	7.000	6.932	0.750	0.000	0.47		0.278	3.5		
5.002	17	120 minute 100 year Winter I+30%	7.000	6.013	0.000	0.000	0.62		0.507	4.2		
5.003	18	30 minute 100 year Winter I+30%	7.000	6.911	0.958	0.000	0.54		0.201	9.8		
5.004	19	120 minute 100 year Winter I+30%	7.000	5.868	0.000	0.000	0.36		0.694	6.5		
5.005	20	30 minute 100 year Winter I+30%	7.000	6.887	1.104	0.000	0.86		0.344	13.8		
5.006	21	30 minute 100 year Winter I+30%	7.000	6.860	1.199	0.000	0.93		0.420	14.9		
5.007	22	30 minute 100 year Winter I+30%	7.000	6.832	1.285	0.000	1.00		0.420	16.2		
5.008	23	30 minute 100 year Winter I+30%	6.800	6.800	1.379	0.157	1.13		2.088	29.3		
1.008	9	30 minute 100 year Winter I+30%	6.800	6.766	1.535	0.000	1.77		2.278	57.7		
1.009	10	30 minute 100 year Winter I+30%	7.000	6.740	1.563	0.000	0.78		22.912	21.0		

US/MH		
PN	Name	Status
1.000	1	FLOOD RISK
1.001	2	SURCHARGED*
1.002	3	SURCHARGED*
1.003	4	FLOOD RISK

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

US/MH		
PN	Name	Status
1.004	5	SURCHARGED*
1.005	6	FLOOD RISK
2.000	7	FLOOD RISK
2.001	9	SURCHARGED*
1.006	7	FLOOD RISK
3.000	8	FLOOD RISK
3.001	9	SURCHARGED*
3.002	10	SURCHARGED*
4.000	11	FLOOD RISK
1.007	8	FLOOD RISK
5.000	15	FLOOD RISK
5.001	16	FLOOD RISK
5.002	17	SURCHARGED*
5.003	18	FLOOD RISK
5.004	19	SURCHARGED*
5.005	20	FLOOD RISK
5.006	21	FLOOD RISK
5.007	22	FLOOD RISK
5.008	23	FLOOD
1.008	9	FLOOD RISK
1.009	10	FLOOD RISK