WH160

August 2021

Block E, Mill Pond, Dartford

Surface Water Drainage Strategy

Weston Homes

Revision A

Weston Homes

BACKGROUND

Existing Site

The site is currently a construction compound for the surrounding Millers Quarter development between Mill Pond Road and Central Road, Dartford. The land is a cleared brownfield site.

Proposed Site

The site is proposed for a mixed use development in the form of a 5 story building providing 14 residential units, one ground floor commercial unit and a basement car park.

Existing Ground Conditions

A ground investigation report carried out by Harrison Geotechnical Engineering (ref. GC19972_SI) in April 2016 revealed ground conditions of made ground over taplow gravels and sands.

A contamination assessment of the site was carried out by RSK STATS Geoconsult Ltd in February 2012 which revealed that the ground was contaminated due to the previous industrial use. Remediation was carried out in the form of a clean impermeable capping layer overlaying the contaminated ground.

Planning

Planning permission is currently being sought for the 5 story mixed use development and the planning authority has suggested the following planning condition:

Condition 3: Surface Water Drainage Scheme

Before commencement of the development hereby approved, a detailed sustainable a surface water drainage scheme for the site shall be submitted to (and approved in writing by) the local planning authority. The detailed drainage scheme shall be based upon the Flood Risk Assessment & Drainage Strategy dated December 2020 and shall demonstrate that the surface water generated by this development (for all rainfall durations and intensities up to and including the climate change adjusted critical 100 year storm) can be accommodated and disposed of without increase to flood risk on or off-site. The drainage scheme shall also demonstrate (with reference to published guidance):

- *that silt and pollutants resulting from the site use can be adequately managed to ensure there is no pollution risk to receiving waters.*
- *appropriate operational, maintenance and access requirements for each drainage feature or SuDS component are adequately considered, including any proposed arrangements for future adoption by any public body or statutory undertaker.*

The drainage scheme shall be implemented as approved thereafter.

The following seeks to address this condition.

SURFACE WATER DRAINAGE STRATEGY

Existing Surface Water Drainage

There is an existing 300ø surface water sewer running through the surrounding development which discharges into the River Darent with a flap valve to prevent high waters back-flowing into the on-site network. This sewer was constructed as part of the development works and has been sized to include the Block E development.

Proposed Surface Water Drainage

As noted in the planning condition, a flood risk assessment and drainage strategy was carried out by EAS in December 2020. This outline strategy determined that infiltration based SuDS along with the larger SuDS features such as basins, ponds and underground storage cells, would not be suitable for this development, partly due to spatial constraints, but mostly due to the underlying capping layer protecting the site from the contaminated ground. Any infiltration based SuDS would allow contaminants to migrate into the groundwater and deep excavations would breach the protection layer.

The strategy is to connect the Block E development to the existing 300ø surface water sewer which has been designed to cater for storms up to and including 1 in 100 year events (including 40% CC). The detailed design follows this outline strategy.

Drawing Number WH160/19/E/15.02 in Appendix A shows the proposed detailed drainage strategy.

The calculations show that the existing 300ø pipe has sufficient capacity for the new development with no surcharging for a 1 in 1 year storm, no flooding for a 1 in 30 year storm and no flooding for a 1 in 100 year (+40% CC) storm.

MicroDrainage calculations for the detailed design are included in Appendix B.

Water Quality

The new building covers almost 100% of the site with small areas of soft and non-vehicular hard landscaping surrounding the building. As such, any water falling on the development will either soak straight into the soft landscaping or will be draining from the roof. The roof construction will be a normal residential roof construction which is determined as 'Very Low' pollution risk in the Ciria SuDS Manual.

Therefore no silt removal or pollution mitigation will be required.

Drainage Management and Maintenance Plan

Management and maintenance of the drainage system will be the responsibility of the management company for the building. The management company will employ a specialist drainage contractor to inspect and clean out the gullies, channel drains and pipework. This will be carried out every 3 months for the first year and then at 6 monthly intervals afterwards. Any remedial works will be carried out by the specialist drainage contractor as and when necessary.

APPENDIX A

Drainage Strategy Drawing No. WH160/19/E/15.02

FOUL WATER CHAMBERS				
I.C.	C.L.	I.L.	DEPTH	TYPE
F18	5.780	4.580	1.200	450mm I.C.
F19	5.000	3.520	1.480	450mm R.A.

SURFACE WATER CHAMBERS				
I.C.	C.L.	I.L.	DEPTH	TYPE
S14	3.210	2.330	0.880	PUMP CHAMBER
S15	4.850	4.200	0.650	450mm I.C.
S16	4.770	4.110	0.660	450mm I.C.

* I.L. SHOWN IS FOR LARGEST PIPE IN CHAMBER, SMALLER PIPES ARE TO BE CONNECTED SOFFIT TO SOFFIT

SUB STATION

WATER TANK / PUMP ROOM

GAS METER ROOM

Car Park +3.185 AOD

EXISTING SW MH
IL: 3.100 (IN)
IL: 2.725 (OUT)

EXISTING SW MH
CL: 4.490
IL: 3.080 (300Ø)

EXISTING SW MH
CL: 4.665
IL: 3.650

EXISTING FW MH
CL: 4.810
IL: 3.280

EXISTING SW MH
CL: 4.705
IL: 3.780

EXISTING FW MH
CL: 4.815
IL: 3.750

EXISTING SW MH
CL: 5.040
IL: 4.240

EXISTING FW MH
CL: 5.420
IL: 3.320

TWFWMH No. 5402
CL: 5.520
IL: 3.270 (225Ø)
DEPTH 2.250m

EXISTING INTERCEPTOR TO REMAIN

CHANNEL DRAIN

100Ø SW D.PIPE
TOP IL:5.425
BTM IL:4.130

32Ø PUMPED SW MDPE PIPE TO RISE UP COLUMN AT THIS POINT TO CEILING HEIGHT & CONNECT WITH SUSPENDED SW DRAINAGE

150Ø FW D.PIPE
TOP IL:5.295
BTM IL:4.585

150Ø FW D.PIPE
TOP IL:5.295
BTM IL:3.540

EXISTING 150ø @1:80

BW 4.5mh

Asphalt

-	XXXXXXXXXXXXXXXXXXXXXX	****	**/**/**
Revision	Description	Checked By	Date

Checked Prelim Issue		Checked Condoc Issue	
Author	Manager	Author	Manager
****	****	****	****
Date	Date	Date	Date
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PRELIMINARY DOCUMENT ISSUE

Title: BLOCK E DRAINAGE LAYOUT

Site: MILL POND, DARTFORD

Drg.: WH160/19/E/15.02

Date: 14/11/19 | Rev: -

Drawn: CC | Scale: 1:100 @ A1

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APPENDIX B

MicroDrainage Calculations

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)	1	PIMP (%)	100
M5-60 (mm)	20.000	Add Flow / Climate Change (%)	0
Ratio R	0.442	Minimum Backdrop Height (m)	0.200
Maximum Rainfall (mm/hr)	50	Maximum Backdrop Height (m)	1.500
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	1.200
Foul Sewage (l/s/ha)	0.000	Min Vel for Auto Design only (m/s)	1.00
Volumetric Runoff Coeff.	0.750	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Time Area Diagram for Storm

Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.290	4-8	0.173

Total Area Contributing (ha) = 0.463

Total Pipe Volume (m³) = 6.481

Network Design Table for Storm

« - 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	19.827	0.200	99.1	0.026	5.00	0.0	0.600	o	100	Pipe/Conduit	
2.000	8.041	0.080	100.5	0.026	5.00	0.0	0.600	o	100	Pipe/Conduit	
3.000	13.554	0.135	100.4	0.013	5.00	0.0	0.600	o	100	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	5.43	5.500	0.026	0.0	0.0	0.0	0.77	6.1	3.5
2.000	50.00	5.17	5.500	0.026	0.0	0.0	0.0	0.77	6.0	3.5
3.000	50.00	5.29	5.500	0.013	0.0	0.0	0.0	0.77	6.0	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)	Section Type	Auto Design
1.001	2.385	1.190	2.0	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit	
4.000	6.579	0.090	73.1	0.005	5.00	0.0	0.600	o	100	Pipe/Conduit	
5.000	15.313	0.320	47.9	0.014	5.00	0.0	0.600	o	100	Pipe/Conduit	
1.002	10.512	1.030	10.2	0.020	0.00	0.0	0.600	o	150	Pipe/Conduit	
6.000	7.435	1.115	6.7	0.005	5.00	0.0	0.600	o	100	Pipe/Conduit	
7.000	33.227	0.090	369.2	0.327	5.00	0.0	0.600	o	300	Pipe/Conduit	
1.003	19.935	0.059	337.9	0.027	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.004	2.500	0.010	250.0	0.000	0.00	0.0	0.600	o	1000	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)
1.001	50.00	5.44	5.300	0.065	0.0	0.0	0.0	5.51	43.3	8.8
4.000	50.00	5.12	4.200	0.005	0.0	0.0	0.0	0.90	7.1	0.7
5.000	50.00	5.23	4.430	0.014	0.0	0.0	0.0	1.12	8.8	1.9
1.002	50.00	5.49	4.110	0.104	0.0	0.0	0.0	3.17	56.1	14.1
6.000	50.00	5.04	4.195	0.005	0.0	0.0	0.0	3.01	23.7	0.7
7.000	50.00	5.68	3.170	0.327	0.0	0.0	0.0	0.81	57.4	44.3
1.003	50.00	6.07	3.080	0.463	0.0	0.0	0.0	0.85	60.1«	62.7
1.004	50.00	6.09	2.321	0.463	0.0	0.0	0.0	2.11	1657.5	62.7

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	18.500	5.500	12.900	Open Manhole	1200
2.000	o	100	2	18.500	5.500	12.900	Open Manhole	1200
3.000	o	100	3	18.500	5.500	12.900	Open Manhole	1200
1.001	o	100	4	18.500	5.300	13.100	Open Manhole	1200
4.000	o	100	5	4.850	4.200	0.550	Open Manhole	1200
5.000	o	100	6	4.860	4.430	0.330	Open Manhole	1200
1.002	o	150	7	4.770	4.110	0.510	Open Manhole	1200
6.000	o	100	8	4.595	4.195	0.300	Open Manhole	1200
7.000	o	300	9	4.680	3.170	1.210	Open Manhole	1200
1.003	o	300	10	4.490	3.080	1.110	Open Manhole	1200
1.004	o	1000	11	4.600	2.321	1.279	Open Manhole	1900

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	19.827	99.1	4	18.500	5.300	13.100	Open Manhole	1200
2.000	8.041	100.5	4	18.500	5.420	12.980	Open Manhole	1200
3.000	13.554	100.4	4	18.500	5.365	13.035	Open Manhole	1200
1.001	2.385	2.0	7	4.770	4.110	0.560	Open Manhole	1200
4.000	6.579	73.1	7	4.770	4.110	0.560	Open Manhole	1200
5.000	15.313	47.9	7	4.770	4.110	0.560	Open Manhole	1200
1.002	10.512	10.2	10	4.490	3.080	1.260	Open Manhole	1200
6.000	7.435	6.7	10	4.490	3.080	1.310	Open Manhole	1200
7.000	33.227	369.2	10	4.490	3.080	1.110	Open Manhole	1200
1.003	19.935	337.9	11	4.600	3.021	1.279	Open Manhole	1900
1.004	2.500	250.0		3.720	2.311	0.409	Open Manhole	1000

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)
1.004		3.720	2.311	0.000	1000	0

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/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 Storage Structures	0
Number of Online Controls	0	Number of Time/Area Diagrams	1
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	1	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	20.000	Storm Duration (mins)	30
Ratio R	0.442		

Time Area Diagram for Green Roof at Pipe Number 7.000 (Storm)

Area (m³)	1295	Evaporation (mm/day)	3
Depression Storage (mm)	5	Decay Coefficient	0.050

Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)
0	4	0.023533	32	36	0.004751	64	68	0.000959	96	100	0.000194
4	8	0.019267	36	40	0.003890	68	72	0.000785	100	104	0.000159
8	12	0.015774	40	44	0.003185	72	76	0.000643	104	108	0.000130
12	16	0.012915	44	48	0.002607	76	80	0.000526	108	112	0.000106
16	20	0.010574	48	52	0.002135	80	84	0.000431	112	116	0.000087
20	24	0.008657	52	56	0.001748	84	88	0.000353	116	120	0.000071
24	28	0.007088	56	60	0.001431	88	92	0.000289			
28	32	0.005803	60	64	0.001172	92	96	0.000237			

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

Synthetic Rainfall Details

Rainfall Model	FSR	Ratio R	0.433
Region	England and Wales	Cv (Summer)	0.750
M5-60 (mm)	20.000	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, 240, 360, 480, 960, 1440
Return Period(s) (years)	1, 30, 100
Climate Change (%)	0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	1	15 Winter	1	+0%	30/15 Summer				5.558
2.000	2	15 Winter	1	+0%	30/15 Summer				5.561
3.000	3	15 Winter	1	+0%	100/15 Summer				5.539
1.001	4	15 Winter	1	+0%	100/15 Summer				5.338
4.000	5	15 Winter	1	+0%	100/15 Summer				4.222
5.000	6	15 Winter	1	+0%	100/15 Summer				4.463
1.002	7	15 Winter	1	+0%	100/15 Summer				4.165
6.000	8	15 Winter	1	+0%					4.207
7.000	9	60 Winter	1	+0%	100/15 Winter				3.229
1.003	10	15 Winter	1	+0%	100/15 Summer				3.201
1.004	11	15 Winter	1	+0%					2.430

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	1	-0.042	0.000	0.62			3.7	OK	
2.000	2	-0.039	0.000	0.67			3.7	OK	
3.000	3	-0.061	0.000	0.32			1.8	OK	
1.001	4	-0.062	0.000	0.30			9.2	OK	

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

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
4.000	5	-0.078	0.000	0.11			0.7	OK	
5.000	6	-0.067	0.000	0.24			2.0	OK	
1.002	7	-0.095	0.000	0.29			14.4	OK	
6.000	8	-0.088	0.000	0.03			0.7	OK	
7.000	9	-0.241	0.000	0.08			4.4	OK	
1.003	10	-0.179	0.000	0.34			17.7	OK	
1.004	11	-0.891	0.000	0.03			17.8	OK	

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

Synthetic Rainfall Details

Rainfall Model		FSR	Ratio R 0.433
Region	England and Wales	Cv (Summer)	0.750
M5-60 (mm)	20.000	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, 240, 360, 480, 960, 1440
Return Period(s) (years)	1, 30, 100
Climate Change (%)	0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	1	15 Winter	30	+0%	30/15 Summer				5.811
2.000	2	15 Winter	30	+0%	30/15 Summer				5.729
3.000	3	15 Winter	30	+0%	100/15 Summer				5.568
1.001	4	15 Winter	30	+0%	100/15 Summer				5.362
4.000	5	15 Winter	30	+0%	100/15 Summer				4.236
5.000	6	15 Winter	30	+0%	100/15 Summer				4.486
1.002	7	15 Winter	30	+0%	100/15 Summer				4.203
6.000	8	15 Winter	30	+0%					4.214
7.000	9	30 Winter	30	+0%	100/15 Winter				3.295
1.003	10	15 Winter	30	+0%	100/15 Summer				3.290
1.004	11	15 Winter	30	+0%					2.487

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	1	0.211	0.000	1.42			8.3	SURCHARGED	
2.000	2	0.129	0.000	1.62			8.9	SURCHARGED	
3.000	3	-0.032	0.000	0.79			4.5	OK	
1.001	4	-0.038	0.000	0.71			21.5	OK	

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

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
4.000	5	-0.064	0.000	0.27			1.7	OK	
5.000	6	-0.044	0.000	0.58			4.9	OK	
1.002	7	-0.057	0.000	0.69			34.6	OK	
6.000	8	-0.081	0.000	0.08			1.7	OK	
7.000	9	-0.175	0.000	0.26			13.5	OK	
1.003	10	-0.090	0.000	0.82			43.1	OK	
1.004	11	-0.834	0.000	0.07			43.4	OK	

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

Synthetic Rainfall Details

Rainfall Model		FSR Ratio R	0.433
Region	England and Wales	Cv (Summer)	0.750
M5-60 (mm)	20.000	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, 240, 360, 480, 960, 1440
Return Period(s) (years)	1, 30, 100
Climate Change (%)	0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	1	15 Winter	100	+40%	30/15 Summer				6.632
2.000	2	15 Winter	100	+40%	30/15 Summer				6.189
3.000	3	15 Winter	100	+40%	100/15 Summer				5.844
1.001	4	15 Winter	100	+40%	100/15 Summer				5.703
4.000	5	15 Winter	100	+40%	100/15 Summer				4.438
5.000	6	15 Winter	100	+40%	100/15 Summer				4.649
1.002	7	15 Winter	100	+40%	100/15 Summer				4.425
6.000	8	15 Winter	100	+40%					4.221
7.000	9	30 Winter	100	+40%	100/15 Winter				3.510
1.003	10	30 Winter	100	+40%	100/15 Summer				3.453
1.004	11	30 Winter	100	+40%					2.554

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	1	1.032	0.000	2.16			12.6	SURCHARGED	
2.000	2	0.589	0.000	2.72			15.0	SURCHARGED	
3.000	3	0.244	0.000	1.29			7.3	SURCHARGED	
1.001	4	0.303	0.000	1.04			31.6	SURCHARGED	

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

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
4.000	5	0.138	0.000	0.46			2.9	SURCHARGED	
5.000	6	0.119	0.000	0.88			7.4	FLOOD RISK	
1.002	7	0.165	0.000	0.99			49.5	SURCHARGED	
6.000	8	-0.074	0.000	0.15			3.2	OK	
7.000	9	0.040	0.000	0.50			26.4	SURCHARGED	
1.003	10	0.073	0.000	1.57			82.0	SURCHARGED	
1.004	11	-0.767	0.000	0.12			81.8	OK	