

Fairhurst GGA		Page 1								
25 Buckingham Palace Road London SW1W 0PP	69 Redington Road Proposed SW Drainage									
Date 06.07.2015	Designed by LJG									
File 2016-11-02 As Built Drainage.mdx	Checked by									
XP Solutions	Network 2015.1									
Time Area Diagram for Storm <table><tr><th>Time (mins)</th><th>Area (ha)</th><th>Time (mins)</th><th>Area (ha)</th></tr><tr><td>0-4</td><td>0.024</td><td>4-8</td><td>0.006</td></tr></table> Total Area Contributing (ha) = 0.030 Total Pipe Volume (m³) = 0.778			Time (mins)	Area (ha)	Time (mins)	Area (ha)	0-4	0.024	4-8	0.006
Time (mins)	Area (ha)	Time (mins)	Area (ha)							
0-4	0.024	4-8	0.006							
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Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	PN	Pipe Out Invert Level (m)	Diameter (mm)	PN	Pipes In Invert Level (m)	Diameter (mm)	Backdrop (mm)
CWIC06	18.610	0.790	Open Manhole	500 x 400	1.000	17.820	100				
CWIC05	20.260	2.970	Open Manhole	500 x 400	1.001	17.290	100	1.000	17.290	100	
SWIC01	18.330	1.000	Open Manhole	500	2.000	17.330	150				
SWHBMH	19.150	3.150	Open Manhole	1500	2.001	16.000	150	2.000	16.270	150	270
CWIC04	19.200	3.510	Open Manhole	500 x 400	1.002	15.690	150	1.001	15.690	100	
								2.001	15.690	150	
OF	19.000	3.357	Open Manhole	0		OUTFALL		1.002	15.643	150	

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	CWIC06	18.610	17.820	0.690	Open Manhole	500 x 400
1.001	o	100	CWIC05	20.260	17.290	2.870	Open Manhole	500 x 400
2.000	o	150	SWIC01	18.330	17.330	0.850	Open Manhole	500
2.001	o	150	SWHBMH	19.150	16.000	3.000	Open Manhole	1500
1.002	o	150	CWIC04	19.200	15.690	3.360	Open Manhole	500 x 400

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	9.016	17.0	CWIC05	20.260	17.290	2.870	Open Manhole	500 x 400
1.001	20.416	12.8	CWIC04	19.200	15.690	3.410	Open Manhole	500 x 400
2.000	22.475	21.2	SWHBMH	19.150	16.270	2.730	Open Manhole	1500
2.001	3.829	12.4	CWIC04	19.200	15.690	3.360	Open Manhole	500 x 400
1.002	4.658	100.0	OF	19.000	15.643	3.207	Open Manhole	0

Online Controls for Storm

Hydro-Brake Optimum® Manhole: SWHBMH, DS/PN: 2.001, Volume (m³): 5.9

Unit Reference	MD-SHE-0038-1100-3000-1100	Diameter (mm)	38
Design Head (m)	3.000	Invert Level (m)	16.000
Design Flow (l/s)	1.1	Minimum Outlet Pipe Diameter (mm)	75
Flush-Flo™	Calculated	Suggested Manhole Diameter (mm)	1200
Objective	Minimise upstream storage		

Control Points			Control Points		
	Head (m)	Flow (l/s)		Head (m)	Flow (l/s)
Design Point (Calculated)	3.000	1.1	Kick-Flo®	0.338	0.4
Flush-Flo™	0.169	0.5	Mean Flow over Head Range	-	0.8

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)	Depth (m)	Flow (l/s)
0.100	0.5	0.600	0.5	1.600	0.8	2.600	1.0	5.000	1.4	7.500	1.7
0.200	0.5	0.800	0.6	1.800	0.9	3.000	1.1	5.500	1.4	8.000	1.7
0.300	0.5	1.000	0.7	2.000	0.9	3.500	1.2	6.000	1.5	8.500	1.8
0.400	0.5	1.200	0.7	2.200	1.0	4.000	1.3	6.500	1.6	9.000	1.8
0.500	0.5	1.400	0.8	2.400	1.0	4.500	1.3	7.000	1.6	9.500	1.9

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

Simulation Criteria
Areal Reduction Factor 1.000 Manhole Headloss Coeff (Global) 0.500 MADD Factor * 10m³/ha Storage 2.000
Hot Start (mins) 0 Foul Sewage per hectare (l/s) 0.000 Inlet Coeffiecient 0.800
Hot Start Level (mm) 0 Additional Flow - % of Total Flow 0.000 Flow per Person per Day (l/per/day) 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 0 Number of Real Time Controls 0

Synthetic Rainfall Details
Rainfall Model FSR M5-60 (mm) 20.800 Cv (Summer) 0.750
Region England and Wales Ratio R 0.438 Cv (Winter) 0.840
Margin for Flood Risk Warning (mm) 300.0 DVD Status ON
Analysis Timestep 2.5 Second Increment (Extended) 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, 0, 30

US/MH		Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level	Surcharged Depth	Flooded Volume	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)
PN	Name								(m)	(m)	(m³)			
1.000	CWIC06	15 Winter	1	+0%					17.832	-0.088	0.000	0.03		0.4
1.001	CWIC05	15 Winter	1	+0%					17.309	-0.081	0.000	0.08		1.3
2.000	SWIC01	15 Winter	1	+0%	30/30 Winter	100/30 Summer			17.359	-0.121	0.000	0.08		3.0
2.001	SWHBMH	30 Winter	1	+0%	1/15 Summer				16.575	0.425	0.000	0.02		0.5
1.002	CWIC04	15 Winter	1	+0%					15.726	-0.114	0.000	0.13		1.8

US/MH		Status	Level Exceeded
PN	Name		
1.000	CWIC06	OK	
1.001	CWIC05	OK	
2.000	SWIC01	OK	7
2.001	SWHBMH	SURCHARGED	
1.002	CWIC04	OK	

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

Simulation Criteria

Areal Reduction Factor	1.000	Manhole Headloss Coeff (Global)	0.500	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Foul Sewage per hectare (l/s)	0.000	Inlet Coeffiecient	0.800
Hot Start Level (mm)	0	Additional Flow - % of Total Flow	0.000	Flow per Person per Day (l/per/day)	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 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FSR M5-60 (mm)	20.800	Cv (Summer)	0.750	
Region	England and Wales	Ratio R	0.438	Cv (Winter)	0.840

Margin for Flood Risk Warning (mm) 300.0 DVD Status ON
Analysis Timestep 2.5 Second Increment (Extended) 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, 0, 30

					Water				Surcharged		Flooded		Pipe	
PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Level (m)	Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)	Flow (l/s)
1.000	CWIC06	15 Winter	30	+0%					17.839	-0.081	0.000	0.08		1.1
1.001	CWIC05	15 Winter	30	+0%					17.323	-0.067	0.000	0.23		3.8
2.000	SWIC01	60 Winter	30	+0%	30/30 Winter	100/30 Summer			17.594	0.114	0.000	0.10		3.7
2.001	SWHBMH	60 Winter	30	+0%	1/15 Summer				17.590	1.440	0.000	0.02		0.8
1.002	CWIC04	15 Winter	30	+0%					15.749	-0.091	0.000	0.32		4.4

US/MH		Level	
PN	Name	Status	Exceeded
1.000	CWIC06	OK	
1.001	CWIC05	OK	
2.000	SWIC01	SURCHARGED	7
2.001	SWHBMH	SURCHARGED	
1.002	CWIC04	OK	

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

Simulation Criteria

Areal Reduction Factor 1.000 Manhole Headloss Coeff (Global) 0.500 MADD Factor * 10m³/ha Storage 2.000
Hot Start (mins) 0 Foul Sewage per hectare (l/s) 0.000 Inlet Coeffiecient 0.800
Hot Start Level (mm) 0 Additional Flow - % of Total Flow 0.000 Flow per Person per Day (l/per/day) 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 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 20.800 Cv (Summer) 0.750
Region England and Wales Ratio R 0.438 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0 DVD Status ON
Analysis Timestep 2.5 Second Increment (Extended) 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, 0, 30

									Water	Surcharged	Flooded				Pipe
	US/MH			Return	Climate	First (X)	First (Y)	First (Z)	Overflow	Level	Depth	Volume	Flow /	Overflow	Flow
PN	Name	Storm		Period	Change	Surcharge	Flood	Overflow	Act.	(m)	(m)	(m³)	Cap.	(l/s)	(l/s)
1.000	CWIC06	15	Winter	100	+30%					17.845	-0.075	0.000	0.14		1.9
1.001	CWIC05	15	Winter	100	+30%					17.334	-0.056	0.000	0.39		6.5
2.000	SWIC01	60	Winter	100	+30%	30/30 Winter	100/30 Summer			18.331	0.851	1.380	0.15		5.6
2.001	SWHBMH	30	Winter	100	+30%	1/15 Summer				18.330	2.180	0.000	0.03		1.0
1.002	CWIC04	15	Winter	100	+30%					15.769	-0.071	0.000	0.53		7.2

US/MH		Level	
PN	Name	Status	Exceeded
1.000	CWIC06	OK	
1.001	CWIC05	OK	
2.000	SWIC01	FLOOD	7
2.001	SWHBMH	SURCHARGED	
1.002	CWIC04	OK	