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
S1.000	32.000	0.547	58.5	0.420	5.00	0.0	0.600	o	450	Pipe/Conduit	
S1.001	74.000	0.060	1233.3	0.420	0.00	0.0	0.600	o	525	Pipe/Conduit	
S1.002	54.000	0.130	415.4	0.420	0.00	0.0	0.600	o	525	Pipe/Conduit	
S2.000	88.000	0.440	200.0	0.420	5.00	0.0	0.600	o	375	Pipe/Conduit	
S2.001	36.000	0.030	1200.0	0.420	0.00	0.0	0.600	o	450	Pipe/Conduit	
S2.002	20.000	0.030	666.7	0.420	0.00	0.0	0.600	o	450	Pipe/Conduit	
S1.003	15.000	0.490	30.6	0.420	0.00	0.0	0.600	o	600	Pipe/Conduit	
S1.004	38.000	0.200	190.0	0.420	0.00	0.0	0.600	o	600	Pipe/Conduit	
S1.005	3.000	0.490	6.1	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
S3.000	30.000	0.310	96.8	0.254	5.00	0.0	0.600	o	150	Pipe/Conduit	
S3.001	79.000	0.420	188.1	0.254	0.00	0.0	0.600	o	225	Pipe/Conduit	
S3.002	14.000	0.380	36.8	0.254	0.00	0.0	0.600	o	300	Pipe/Conduit	
S4.000	45.000	0.920	48.9	0.254	5.00	0.0	0.600	o	225	Pipe/Conduit	
S5.000	45.000	0.760	59.2	0.254	5.00	0.0	0.600	o	225	Pipe/Conduit	
S3.003	23.000	0.070	328.6	0.254	0.00	0.0	0.600	o	375	Pipe/Conduit	
S3.004	5.000	1.500	3.3	0.254	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)
S1.000	0.00	5.20	47.000	0.420	0.0	0.0	0.0	2.66	423.4	0.0
S1.001	0.00	7.16	46.450	0.840	0.0	0.0	0.0	0.63	136.2	0.0
S1.002	0.00	7.98	46.390	1.260	0.0	0.0	0.0	1.09	236.5	0.0
S2.000	0.00	6.15	46.760	0.420	0.0	0.0	0.0	1.28	141.1	0.0
S2.001	0.00	7.19	46.320	0.840	0.0	0.0	0.0	0.58	92.0	0.0
S2.002	0.00	7.61	46.290	1.260	0.0	0.0	0.0	0.78	124.0	0.0
S1.003	0.00	8.04	46.260	2.940	0.0	0.0	0.0	4.41	1247.5	0.0
S1.004	0.00	8.40	45.770	3.360	0.0	0.0	0.0	1.76	498.6	0.0
S1.005	0.00	8.41	45.570	3.360	0.0	0.0	0.0	9.88	2794.1	0.0
S3.000	0.00	5.49	48.070	0.254	0.0	0.0	0.0	1.02	18.1	0.0
S3.001	0.00	6.88	47.760	0.508	0.0	0.0	0.0	0.95	37.8	0.0
S3.002	0.00	6.97	47.340	0.762	0.0	0.0	0.0	2.60	183.7	0.0
S4.000	0.00	5.40	47.880	0.254	0.0	0.0	0.0	1.87	74.5	0.0
S5.000	0.00	5.44	47.720	0.254	0.0	0.0	0.0	1.70	67.7	0.0
S3.003	0.00	7.35	46.960	1.524	0.0	0.0	0.0	0.99	109.8	0.0
S3.004	0.00	7.36	46.890	1.778	0.0	0.0	0.0	9.98	1102.5	0.0

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
S1.006	2.000	0.004	500.0	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
S1.007	20.000	0.080	250.0	0.000	0.00	0.0	0.600	o	1500	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)
S1.006	0.00	8.44	45.080	5.138	0.0	0.0	0.0	1.08	306.0	0.0
S1.007	0.00	8.56	44.670	5.138	0.0	0.0	0.0	2.71	4786.2	0.0

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	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FEH
Return Period (years)	2
FEH Rainfall Version	1999
Site Location	GB 526100 184450 TQ 26100 84450
C (1km)	-0.025
D1 (1km)	0.330
D2 (1km)	0.277
D3 (1km)	0.234
E (1km)	0.332
F (1km)	2.519
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Storm Duration (mins)	30

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	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FEH
FEH Rainfall Version	1999
Site Location	GB 526100 184450 TQ 26100 84450
C (1km)	-0.025
D1 (1km)	0.330
D2 (1km)	0.277
D3 (1km)	0.234
E (1km)	0.332
F (1km)	2.519
Cv (Summer)	0.750
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, 240, 360, 480, 960, 1440
Return Period(s) (years)	100
Climate Change (%)	40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
S1.000	S1	15 Winter	100	+40%	100/15 Summer	100/15 Summer		
S1.001	S2	15 Winter	100	+40%	100/15 Summer	100/15 Summer		
S1.002	S3	15 Winter	100	+40%	100/15 Summer	100/15 Summer		
S2.000	S4	30 Winter	100	+40%	100/15 Summer	100/15 Summer		
S2.001	S5	15 Winter	100	+40%	100/15 Summer	100/15 Summer		
S2.002	S6	15 Winter	100	+40%	100/15 Summer	100/15 Summer		
S1.003	S4	15 Winter	100	+40%	100/15 Summer	100/15 Summer		
S1.004	S5	15 Winter	100	+40%	100/15 Summer	100/15 Summer		
S1.005	S6	15 Summer	100	+40%	100/15 Summer			
S3.000	S10	60 Winter	100	+40%	100/15 Summer	100/15 Summer		
S3.001	S11	30 Winter	100	+40%	100/15 Summer	100/15 Summer		
S3.002	S12	15 Winter	100	+40%	100/15 Summer	100/15 Summer		
S4.000	S13	15 Winter	100	+40%	100/15 Summer	100/15 Summer		
S5.000	S14	15 Winter	100	+40%	100/15 Summer	100/15 Summer		

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

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
S1.000	S1	48.544	1.094	496.354	0.99			362.6	FLOOD
S1.001	S2	49.072	2.097	51.903	2.55			356.4	FLOOD
S1.002	S3	49.309	2.394	119.256	1.67			355.1	FLOOD
S2.000	S4	49.477	2.342	217.268	1.88			254.0	FLOOD
S2.001	S5	49.559	2.789	98.576	5.77			435.0	FLOOD
S2.002	S6	49.521	2.781	91.352	6.22			483.6	FLOOD
S1.003	S4	49.355	2.495	44.727	1.06			746.3	FLOOD
S1.004	S5	49.185	2.815	0.000	2.10			885.8	FLOOD RISK
S1.005	S6	48.383	2.213	0.000	1.26			885.9	SURCHARGED
S3.000	S10	49.423	1.203	122.559	2.13			36.9	FLOOD
S3.001	S11	49.365	1.380	104.744	2.04			75.0	FLOOD
S3.002	S12	49.281	1.641	112.650	1.43			218.2	FLOOD
S4.000	S13	49.520	1.415	79.530	1.36			97.0	FLOOD
S5.000	S14	49.434	1.489	84.132	1.46			94.5	FLOOD

PN	US/MH Name	Level Exceeded
S1.000	S1	9
S1.001	S2	4
S1.002	S3	5
S2.000	S4	7
S2.001	S5	5
S2.002	S6	5
S1.003	S4	3
S1.004	S5	
S1.005	S6	
S3.000	S10	13
S3.001	S11	9
S3.002	S12	6
S4.000	S13	7
S5.000	S14	7

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
S3.003	S13	15 Winter	100	+40%	100/15 Summer	100/15 Summer		
S3.004	S14	15 Summer	100	+40%	100/15 Summer			
S1.006	S7	15 Summer	100	+40%	100/15 Summer			
S1.007	S8	15 Winter	100	+40%				

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
S3.003	S13	49.316	1.981	15.870	3.93			369.7	FLOOD
S3.004	S14	49.040	1.775	0.000	1.01			484.8	FLOOD RISK
S1.006	S7	47.558	1.878	0.000	5.87			1367.3	SURCHARGED
S1.007	S8	45.447	-0.723	0.000	0.52			1368.3	OK

PN	US/MH Name	Level Exceeded
S3.003	S13	2
S3.004	S14	
S1.006	S7	
S1.007	S8	

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FEH Rainfall Model

Return Period (years)	2
FEH Rainfall Version	1999
Site Location	GB 526100 184450 TQ 26100 84450
C (1km)	-0.025
D1 (1km)	0.330
D2 (1km)	0.277
D3 (1km)	0.234
E (1km)	0.332
F (1km)	2.519
Maximum Rainfall (mm/hr)	0
Maximum Time of Concentration (mins)	30
Foul Sewage (l/s/ha)	0.000
Volumetric Runoff Coeff.	0.750
PIMP (%)	100
Add Flow / Climate Change (%)	0
Minimum Backdrop Height (m)	0.000
Maximum Backdrop Height (m)	0.000
Min Design Depth for Optimisation (m)	0.000
Min Vel for Auto Design only (m/s)	1.00
Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Time Area Diagram for Storm

Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	2.877	4-8	2.198	8-12	0.063

Total Area Contributing (ha) = 5.138

Total Pipe Volume (m³) = 114.498

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

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)

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
S1.000	32.000	0.547	58.5	0.420	5.00	0.0	0.600	o	450	Pipe/Conduit	
S1.001	74.000	0.060	1233.3	0.420	0.00	0.0	0.600	o	525	Pipe/Conduit	
S1.002	54.000	0.130	415.4	0.420	0.00	0.0	0.600	o	525	Pipe/Conduit	
S2.000	88.000	0.440	200.0	0.420	5.00	0.0	0.600	o	375	Pipe/Conduit	
S2.001	36.000	0.030	1200.0	0.420	0.00	0.0	0.600	o	450	Pipe/Conduit	
S2.002	20.000	0.030	666.7	0.420	0.00	0.0	0.600	o	450	Pipe/Conduit	
S1.003	15.000	0.490	30.6	0.420	0.00	0.0	0.600	o	600	Pipe/Conduit	
S1.004	38.000	0.200	190.0	0.420	0.00	0.0	0.600	o	600	Pipe/Conduit	
S1.005	3.000	0.490	6.1	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
S3.000	30.000	0.310	96.8	0.254	5.00	0.0	0.600	o	150	Pipe/Conduit	
S3.001	79.000	0.420	188.1	0.254	0.00	0.0	0.600	o	225	Pipe/Conduit	
S3.002	14.000	0.380	36.8	0.254	0.00	0.0	0.600	o	300	Pipe/Conduit	
S4.000	45.000	0.920	48.9	0.254	5.00	0.0	0.600	o	225	Pipe/Conduit	
S5.000	45.000	0.760	59.2	0.254	5.00	0.0	0.600	o	225	Pipe/Conduit	
S3.003	23.000	0.070	328.6	0.254	0.00	0.0	0.600	o	375	Pipe/Conduit	
S3.004	5.000	1.500	3.3	0.254	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)
S1.000	0.00	5.20	47.000	0.420	0.0	0.0	0.0	2.66	423.4	0.0
S1.001	0.00	7.16	46.450	0.840	0.0	0.0	0.0	0.63	136.2	0.0
S1.002	0.00	7.98	46.390	1.260	0.0	0.0	0.0	1.09	236.5	0.0
S2.000	0.00	6.15	46.760	0.420	0.0	0.0	0.0	1.28	141.1	0.0
S2.001	0.00	7.19	46.320	0.840	0.0	0.0	0.0	0.58	92.0	0.0
S2.002	0.00	7.61	46.290	1.260	0.0	0.0	0.0	0.78	124.0	0.0
S1.003	0.00	8.04	46.260	2.940	0.0	0.0	0.0	4.41	1247.5	0.0
S1.004	0.00	8.40	45.770	3.360	0.0	0.0	0.0	1.76	498.6	0.0
S1.005	0.00	8.41	45.570	3.360	0.0	0.0	0.0	9.88	2794.1	0.0
S3.000	0.00	5.49	48.070	0.254	0.0	0.0	0.0	1.02	18.1	0.0
S3.001	0.00	6.88	47.760	0.508	0.0	0.0	0.0	0.95	37.8	0.0
S3.002	0.00	6.97	47.340	0.762	0.0	0.0	0.0	2.60	183.7	0.0
S4.000	0.00	5.40	47.880	0.254	0.0	0.0	0.0	1.87	74.5	0.0
S5.000	0.00	5.44	47.720	0.254	0.0	0.0	0.0	1.70	67.7	0.0
S3.003	0.00	7.35	46.960	1.524	0.0	0.0	0.0	0.99	109.8	0.0
S3.004	0.00	7.36	46.890	1.778	0.0	0.0	0.0	9.98	1102.5	0.0

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
S1.006	2.000	0.004	500.0	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
S1.007	20.000	0.080	250.0	0.000	0.00	0.0	0.600	o	1500	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)
S1.006	0.00	8.44	45.080	5.138	0.0	0.0	0.0	1.08	306.0	0.0
S1.007	0.00	8.56	44.670	5.138	0.0	0.0	0.0	2.71	4786.2	0.0

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	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FEH
Return Period (years)	2
FEH Rainfall Version	1999
Site Location	GB 526100 184450 TQ 26100 84450
C (1km)	-0.025
D1 (1km)	0.330
D2 (1km)	0.277
D3 (1km)	0.234
E (1km)	0.332
F (1km)	2.519
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Storm Duration (mins)	30

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	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FEH
FEH Rainfall Version	1999
Site Location	GB 526100 184450 TQ 26100 84450
C (1km)	-0.025
D1 (1km)	0.330
D2 (1km)	0.277
D3 (1km)	0.234
E (1km)	0.332
F (1km)	2.519
Cv (Summer)	0.750
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, 240, 360, 480, 960, 1440
Return Period(s) (years)	100
Climate Change (%)	0

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
S1.000	S1	15 Winter	100	+0%	100/15 Summer	100/15 Summer		
S1.001	S2	15 Winter	100	+0%	100/15 Summer	100/15 Summer		
S1.002	S3	15 Winter	100	+0%	100/15 Summer	100/15 Summer		
S2.000	S4	15 Winter	100	+0%	100/15 Summer	100/15 Summer		
S2.001	S5	15 Winter	100	+0%	100/15 Summer	100/15 Summer		
S2.002	S6	15 Winter	100	+0%	100/15 Summer	100/15 Summer		
S1.003	S4	15 Summer	100	+0%	100/15 Summer	100/15 Summer		
S1.004	S5	15 Summer	100	+0%	100/15 Summer			
S1.005	S6	15 Summer	100	+0%	100/15 Summer			
S3.000	S10	30 Winter	100	+0%	100/15 Summer	100/15 Summer		
S3.001	S11	15 Winter	100	+0%	100/15 Summer	100/15 Summer		
S3.002	S12	15 Winter	100	+0%	100/15 Summer	100/15 Summer		
S4.000	S13	15 Winter	100	+0%	100/15 Summer	100/15 Summer		
S5.000	S14	15 Winter	100	+0%	100/15 Summer	100/15 Summer		

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

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
S1.000	S1	48.366	0.916	317.189	1.00			365.6	FLOOD
S1.001	S2	49.031	2.056	11.389	2.49			348.3	FLOOD
S1.002	S3	49.251	2.336	61.716	1.62			345.0	FLOOD
S2.000	S4	49.399	2.264	141.212	1.97			265.8	FLOOD
S2.001	S5	49.509	2.739	49.400	4.80			361.7	FLOOD
S2.002	S6	49.469	2.729	39.034	5.61			436.4	FLOOD
S1.003	S4	49.317	2.457	8.305	1.01			705.1	FLOOD
S1.004	S5	49.088	2.718	0.000	2.06			869.5	FLOOD RISK
S1.005	S6	48.292	2.122	0.000	1.25			873.6	SURCHARGED
S3.000	S10	49.378	1.158	77.968	2.11			36.5	FLOOD
S3.001	S11	49.325	1.340	64.591	2.02			74.4	FLOOD
S3.002	S12	49.222	1.582	52.274	1.42			216.0	FLOOD
S4.000	S13	49.483	1.378	42.577	1.36			96.8	FLOOD
S5.000	S14	49.396	1.451	45.613	1.46			94.2	FLOOD

PN	US/MH Name	Level Exceeded
S1.000	S1	7
S1.001	S2	2
S1.002	S3	4
S2.000	S4	6
S2.001	S5	5
S2.002	S6	4
S1.003	S4	2
S1.004	S5	
S1.005	S6	
S3.000	S10	9
S3.001	S11	7
S3.002	S12	5
S4.000	S13	6
S5.000	S14	6

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
S3.003	S13	15 Summer	100	+0%	100/15 Summer				49.278
S3.004	S14	15 Summer	100	+0%	100/15 Summer				48.897
S1.006	S7	15 Summer	100	+0%	100/15 Summer				47.510
S1.007	S8	15 Summer	100	+0%					45.438

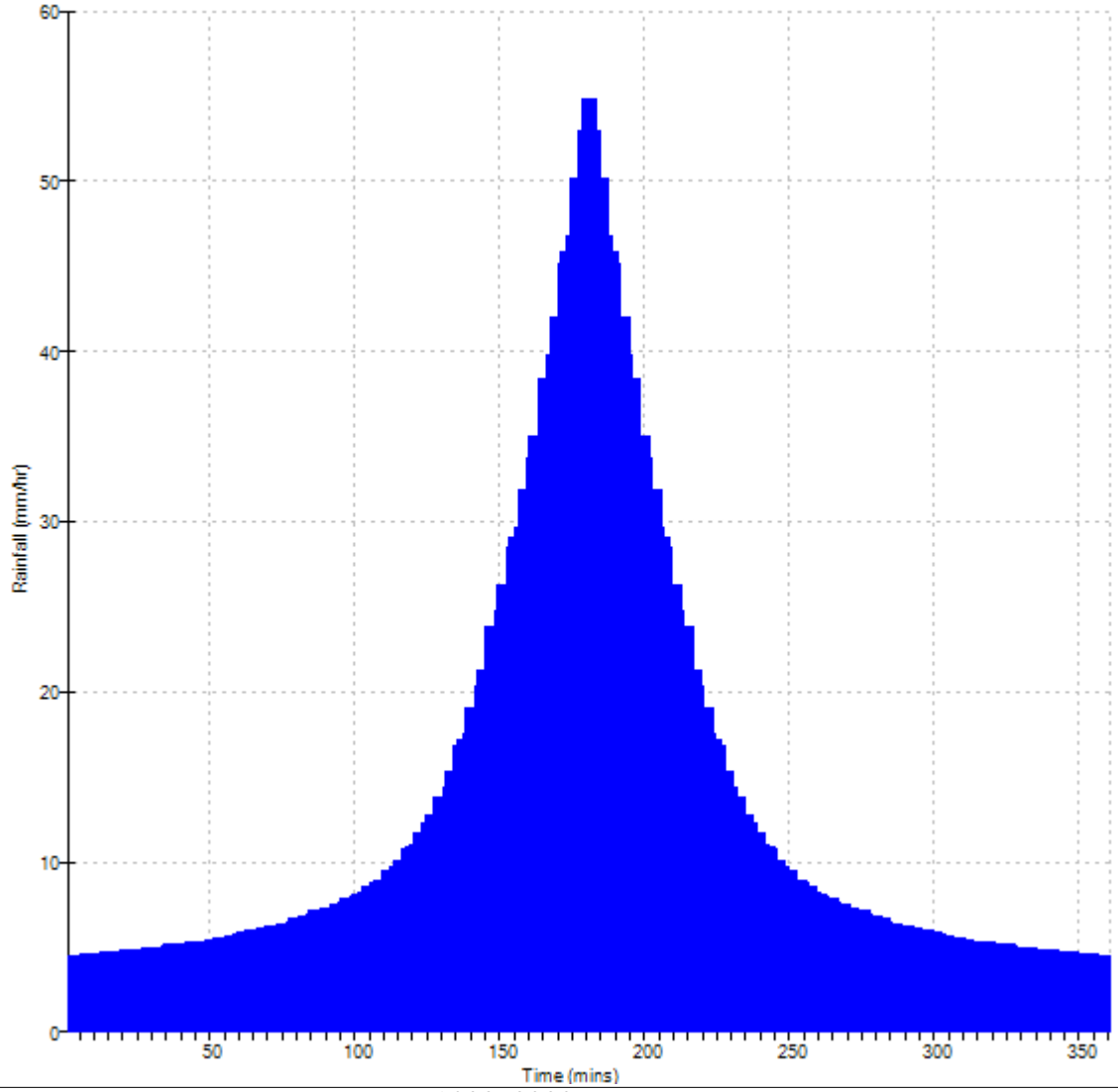
PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S3.003	S13	1.943	0.000	3.86			362.9	FLOOD RISK	
S3.004	S14	1.632	0.000	0.96			459.2	SURCHARGED	
S1.006	S7	1.830	0.000	5.74			1338.9	SURCHARGED	
S1.007	S8	-0.732	0.000	0.51			1337.7	OK	

Rainfall profile

Storm duration (mins) 360

FEH Data

FEH Rainfall Version	1999
Site Location	GB 526100 184450 TQ 26100 84450
C (1km)	-0.025
D1 (1km)	0.330
D2 (1km)	0.277
D3 (1km)	0.234
E (1km)	0.332
F (1km)	2.519
Peak Intensity (mm/hr)	54.916
Ave. Intensity (mm/hr)	14.009
Return Period (years)	100.0



Appendix D Existing and Proposed Surface Water Drainage Layout and Proposed SuDS

GENERAL NOTES

G1. DO NOT SCALE THIS DRAWING.

G2. ANY DIMENSIONAL DISCREPANCIES SHOULD BE NOTIFIED TO THE ENGINEER IMMEDIATELY.

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N

BLACKBURN ROAD

N1-A N1-B N1-C N2-A N2-B N3-A N3-B N3-C N4-C N6 N7-A N7-B N7-C N7-D S1-A S1-B S1-C S1-D S8-A S8-B

PHASE 1A
PHASE 1B
PHASE 1C
PHASE 2A
PHASE 2B
PHASE 3A
PHASE 3B

SuDS DRAINAGE KEY

- PROPOSED BROWN ROOF
- PROPOSED GREEN ROOF
- PROPOSED LANDSCAPE (AT PODIUM LEVEL)
- PROPOSED SOFT EXTERNAL LANDSCAPING
- PROPOSED PERMEABLE PAVING
- PROPOSED UNDERGROUND ATTENUATION
- PROPOSED SWALE/POND

BOUNDARY KEY

- LAND OWNERSHIP BOUNDARY
- DENOTES LAND TO WEST TO BE DEVELOPED AT A LATER PHASE
- PHASING BOUNDARY

REV	DESCRIPTION	DRN	CHK	APP	DATE
P05	Updated to Reflect Revised Scheme	HM	MF	MF	05.12.22
P04	Updated to Suit Amended Discharge Rate	JN	JN	MF	05.09.22
P03	Issued for planning	SF	RH	MH	20.01.22
P02	Updated Masterplan	JN	JN	RH	14.01.22
P01	Preliminary Issue	RH	DAR	MH	09.09.21

Pell Frischmann

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Telephone +44 (0)115 784 8960
Email: pfnottingham@pellfrischmann.com
www.pellfrischmann.com

ARCHITECT/CLIENT/CONTRACTOR

Landsec

Project

O2 Finchley Road

Drawing Title

Proposed Sustainable Drainage Systems (SuDS)

Drawing Status

For Planning

	Name	Date
Drawn	RH	09.09.21
Designed	RH	09.09.21
Eng Chk	DAR	09.09.21
Approved	MH	09.09.21

Status Code: S4

Scale: 1:1000 @ A1

Revision: P05

Drawing No.

104878 - PEF - ZZ - ZZ - DR - D - 100008

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EXISTING PUBLIC DRAINAGE KEY

- PUBLIC COMBINED SEWER
- PUBLIC STORM RELIEF SEWER
- ABANDONED SEWER
- SEWER EASEMENT

EXISTING PRIVATE DRAINAGE KEY

- PRIVATE FOUL WATER SEWER
- PRIVATE SURFACE WATER SEWER

PROPOSED DRAINAGE KEY

- PROPOSED SURFACE WATER SEWER
- PROPOSED FOUL WATER SEWER
- PROPOSED RWP
- PROPOSED RWP(POD) FROM PODIUM LEVEL
- PROPOSED ATTENUATION
- PROPOSED SVP
- PROPOSED FLOOR GULLY

BOUNDARY KEY

- LAND OWNERSHIP BOUNDARY
- DENOTES LAND TO WEST TO BE DEVELOPED AT A LATER PHASE
- PHASING BOUNDARY
- BUILDING FOOTPRINTS SUBMITTED UNDER 'OUTLINE' APPLICATION

REV	DESCRIPTION	DRN	CHK	APP	DATE
P07	Discharge Rates Reduced to Greenfield	HM	MF	MF	12.12.22
P06	Updated to submission	HM	MF	MF	15.11.22
P05	Updated to 2 x Greenfield Rate discharge	HM	MF	MF	02.11.22
P04	Updated to Suit Amended Discharge Rates	JN	JN	MF	05.09.22
P03	Issued for planning	SF	RH	MH	20.01.22
P02	Masterplan Updated	JN	JN	RH	14.01.22
P01	Preliminary Issue	RH	DAR	CH	10.09.21

Pell Frischmann

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Telephone +44 (0)115 784 8960
Email: pfnottingham@pellfrischmann.com
www.pellfrischmann.com

ARCHITECT/CLIENT/CONTRACTOR

Landsec

Project

O2 Finchley Road

Drawing Title

Drainage Strategy

Drawing Status

PRELIMINARY

	Name	Date
Drawn	RH	10.09.21
Designed	RH	10.09.21
Eng Chk	MF	10.09.21
Approved	CH	10.09.21

Status Code: S4

Scale: 1:1000 @ A1

Revision: P07

Drawing No.

104878 - PEF - ZZ - ZZ - DR - D - 100010

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PROPOSED LEVELS TO BE DESIGN TO MAINTAIN PROPOSED OVERLAND FLOW PATH DIRECTIONS

BOUNDARY KEY

- LAND OWNERSHIP BOUNDARY
- PHASING BOUNDARY
- OVERLAND SURFACE WATER FLOW ROUTE (FOR EXCEEDANCE EVENTS OVER AND ABOVE THE 100 YEAR +40% CLIMATE CHANGE)
- PROPOSED BUILDING EXTENTS

REV	DESCRIPTION	DRN	CHK	APP	DATE
P02	Phase 2 Route Updated	HM	MF	DAR	05/12/22
P01	First Issue	HM	MF	DAR	04/11/22

Pell Frischmann

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Email: pfnottingham@pellfrischmann.com
www.pellfrischmann.com

ARCHITECT/CLIENT/CONTRACTOR

Landsec

Project

O2 Finchley Road

Drawing Title

Drainage Strategy
Overland Flow Paths

Drawing Status

PRELIMINARY

	Name	Date	Status Code
Drawn	HM	04.11.22	S4
Designed	HM	04.11.22	Scale 1:1000 @ A1
Eng Chk	MF	04.11.22	Revision
Approved	DAR	04.11.22	P02

Drawing No.

104878 - PEF - ZZ - ZZ - DR - D - 100017

Appendix E Thames Water Sewer Records

Asset location search

Property Searches

Pell Frischmann Consultants Ltd
4-5
4-5Manchester Square
LONDON
W1U 3PD

Search address supplied

O2 Management Centre
O2 Centre
255
Finchley Road
London
NW3 6LU

Your reference O2 Finchley

Our reference ALS/ALS Standard/2018_3767718

Search date 4 April 2018

Keeping you up-to-date

Knowledge of features below the surface is essential in every development. The benefits of this not only include ensuring due diligence and avoiding risk, but also being able to ascertain the feasibility for any commercial or residential project.

An asset location search provides information on the location of known Thames Water clean and/or wastewater assets, including details of pipe sizes, direction of flow and depth. Please note that information on cover and invert levels will only be provided where the data is available.

Thames Water Utilities Ltd
Property Searches, PO Box 3189, Slough SL1 4WW
DX 151280 Slough 13

searches@thameswater.co.uk
www.thameswater-propertysearches.co.uk

0845 070 9148

Asset location search

Property Searches

Search address supplied: O2 Management Centre, O2 Centre, 255, Finchley Road, London, NW3 6LU

Dear Sir / Madam

An Asset Location Search is recommended when undertaking a site development. It is essential to obtain information on the size and location of clean water and sewerage assets to safeguard against expensive damage and allow cost-effective service design.

The following records were searched in compiling this report: - the map of public sewers & the map of waterworks. Thames Water Utilities Ltd (TWUL) holds all of these.

This searchprovides maps showing the position, size of Thames Water assets close to the proposed development and also manhole cover and invert levels, where available.

Please note that none of the charges made for this report relate to the provision of Ordnance Survey mapping information. The replies contained in this letter are given following inspection of the public service records available to this company. No responsibility can be accepted for any error or omission in the replies.

You should be aware that the information contained on these plans is current only on the day that the plans are issued. The plans should only be used for the duration of the work that is being carried out at the present time. Under no circumstances should this data be copied or transmitted to parties other than those for whom the current work is being carried out.

Thames Water do update these service plans on a regular basis and failure to observe the above conditions could lead to damage arising to new or diverted services at a later date.

Contact Us

If you have any further queries regarding this enquiry please feel free to contact a member of the team on 0845 070 9148, or use the address below:

Thames Water Utilities Ltd
Property Searches
PO Box 3189
Slough
SL1 4WW

Email: searches@thameswater.co.uk
Web: www.thameswater-propertysearches.co.uk

Waste Water Services

Please provide a copy extract from the public sewer map.

The following quartiles have been printed as they fall within Thames' sewerage area:

TQ2584NW
TQ2584NE
TQ2684NW
TQ2685SW

Enclosed is a map showing the approximate lines of our sewers. Our plans do not show sewer connections from individual properties or any sewers not owned by Thames Water unless specifically annotated otherwise. Records such as "private" pipework are in some cases available from the Building Control Department of the relevant Local Authority.

Where the Local Authority does not hold such plans it might be advisable to consult the property deeds for the site or contact neighbouring landowners.

This report relates only to sewerage apparatus of Thames Water Utilities Ltd, it does not disclose details of cables and or communications equipment that may be running through or around such apparatus.

The sewer level information contained in this response represents all of the level data available in our existing records. Should you require any further Information, please refer to the relevant section within the 'Further Contacts' page found later in this document.

For your guidance:

- The Company is not generally responsible for rivers, watercourses, ponds, culverts or highway drains. If any of these are shown on the copy extract they are shown for information only.
- Any private sewers or lateral drains which are indicated on the extract of the public sewer map as being subject to an agreement under Section 104 of the Water Industry Act 1991 are not an ‘as constructed’ record. It is recommended these details be checked with the developer.

Clean Water Services

Please provide a copy extract from the public water main map.

The following quartiles have been printed as they fall within Thames' water area:

TQ2584NW
TQ2584NE
TQ2684NW
TQ2685SW

Enclosed is a map showing the approximate positions of our water mains and associated apparatus. Please note that records are not kept of the positions of individual domestic supplies.

For your information, there will be a pressure of at least 10m head at the outside stop valve. If you would like to know the static pressure, please contact our Customer Centre on 0800 316 9800. The Customer Centre can also arrange for a full flow and pressure test to be carried out for a fee.

For your guidance:

- Assets other than vested water mains may be shown on the plan, for information only.
- If an extract of the public water main record is enclosed, this will show known public water mains in the vicinity of the property. It should be possible to estimate the likely length and route of any private water supply pipe connecting the property to the public water network.

Payment for this Search

A charge will be added to your suppliers account.

Further contacts:

Waste Water queries

Should you require verification of the invert levels of public sewers, by site measurement, you will need to approach the relevant Thames Water Area Network Office for permission to lift the appropriate covers. This permission will usually involve you completing a TWOSA form. For further information please contact our Customer Centre on Tel: 0845 920 0800. Alternatively, a survey can be arranged, for a fee, through our Customer Centre on the above number.

If you have any questions regarding sewer connections, budget estimates, diversions, building over issues or any other questions regarding operational issues please direct them to our service desk. Which can be contacted by writing to:

Developer Services (Waste Water)
Thames Water
Clearwater Court
Vastern Road
Reading
RG1 8DB

Tel: 0800 009 3921
Email: developer.services@thameswater.co.uk

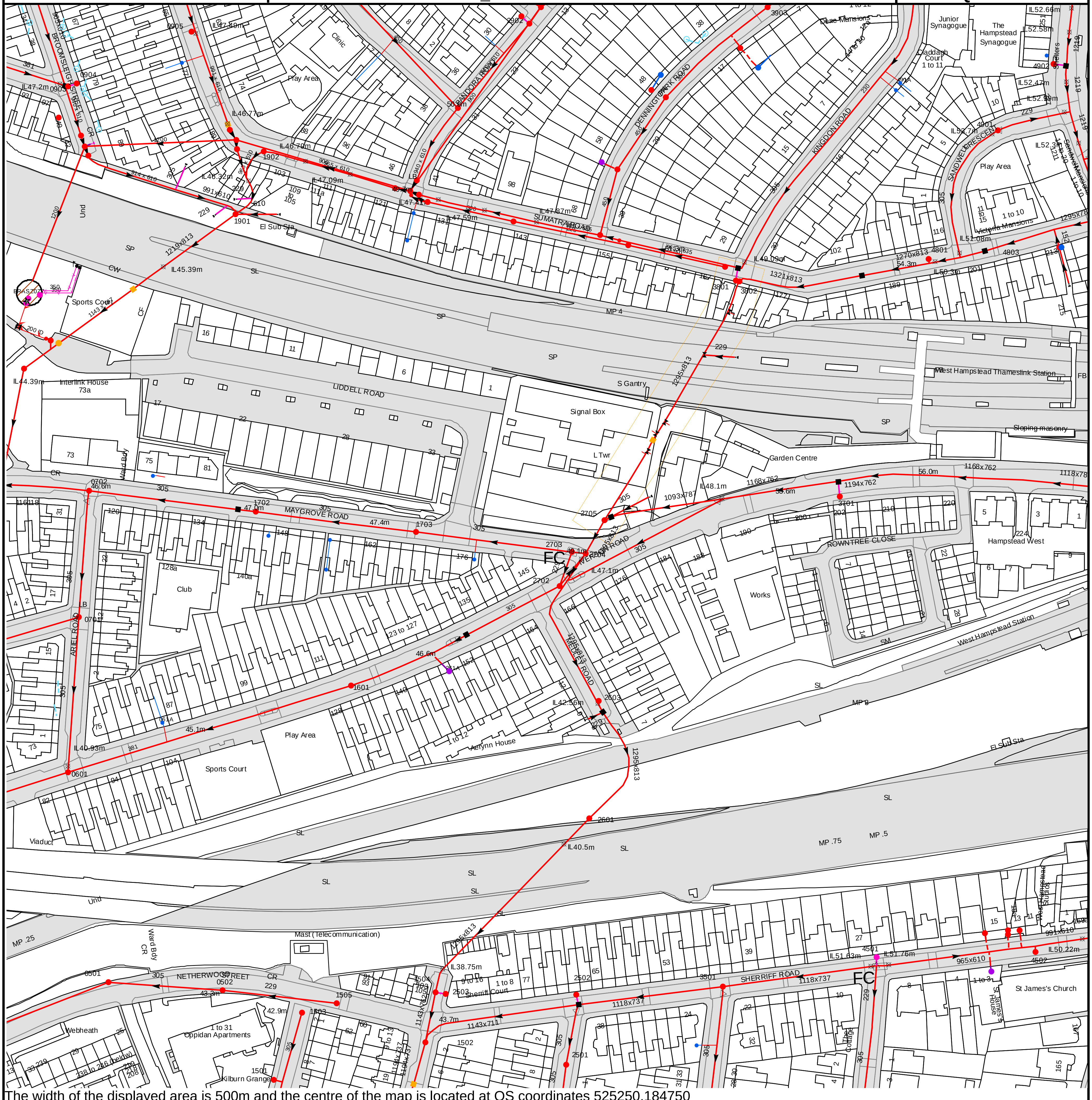
Clean Water queries

Should you require any advice concerning clean water operational issues or clean water connections, please contact:

Developer Services (Clean Water)
Thames Water
Clearwater Court
Vastern Road
Reading
RG1 8DB

Tel: 0800 009 3921
Email: developer.services@thameswater.co.uk

Asset Location Search Sewer Map - ALS/ALS Standard/2018_3767718	TQ2584NW



The width of the displayed area is 500m and the centre of the map is located at OS coordinates 525250,184750

The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.

NB. Levels quoted in metres Ordnance Newlyn Datum. The value -9999.00 indicates that no survey information is available

Manhole Reference	Manhole Cover Level	Manhole Invert Level
4801	54.75	n/a
4803	n/a	n/a
48AD	n/a	n/a
4901	57.68	n/a
4501	55.34	n/a
4504	n/a	n/a
451A	n/a	n/a
4505	n/a	n/a
4507	n/a	n/a
4506	n/a	n/a
4502	n/a	n/a
1501	n/a	n/a
2501	n/a	n/a
351B	n/a	n/a
1502	n/a	n/a
1503	n/a	n/a
1505	n/a	n/a
2502	n/a	n/a
2503	n/a	n/a
1504	44.05	38.58
3501	51.18	47.27
2601	51.08	40.97
2603	48.77	n/a
1601	45.83	43.23
261A	n/a	n/a
2702	48.31	45.26
271A	n/a	n/a
2704	48.99	45.02
2703	48.72	45.94
171A	n/a	n/a
1703	47.44	44.81
2705	50.27	45.44
191A	49.87	40.28
191D	50	46.57
1702	46.98	43.68
1902	49.87	46.59
191B	49.76	47.32
181A	n/a	n/a
191F	49.7	43.21
191I	n/a	n/a
191E	49.79	47.46
191G	49.68	47.38
191C	49.65	47.49
291D	50.75	47.87
281B	50.08	47.76
281A	50.77	48.11
291E	n/a	n/a
291B	51.27	48.58
281D	n/a	n/a
281C	50.9	48.34
29BF	n/a	n/a
39CD	n/a	n/a
391A	52.11	49.57
39BJ	n/a	n/a
39CA	n/a	n/a
381A	51.65	48.84
3801	n/a	n/a
3802	n/a	48.02
3904	n/a	n/a
39CF	n/a	n/a
3701	n/a	n/a
491C	n/a	n/a
491A	n/a	n/a
4902	n/a	n/a
491B	n/a	n/a
3903	54.46	51.65
291A	51.92	43.88
2902	n/a	n/a
291C	51.92	48.55
09FA	n/a	n/a
091D	n/a	n/a
09EJ	n/a	n/a
0905	51.11	n/a
09EI	n/a	n/a
09DJ	n/a	n/a
081E	51.9	44.96
081B	51.69	n/a
081C	51.69	n/a
081D	51.69	n/a
081A	51.89	44.69
09CB	n/a	n/a
0903	n/a	n/a
0904	50.32	n/a
091C	49.67	46.77
09FB	n/a	n/a
09FD	n/a	n/a
091B	49.54	39.9
091A	49.39	46.66
0702	46.62	42.76
09FC	n/a	n/a
071A	n/a	n/a

Manhole Reference	Manhole Cover Level	Manhole Invert Level
191H	50.18	46.69
1901	49.34	45.97
0502	n/a	n/a
0501	n/a	n/a
0601	44.64	40.85
061A	n/a	n/a
0701	45.8	42.09
171B	n/a	n/a
171C	n/a	n/a

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