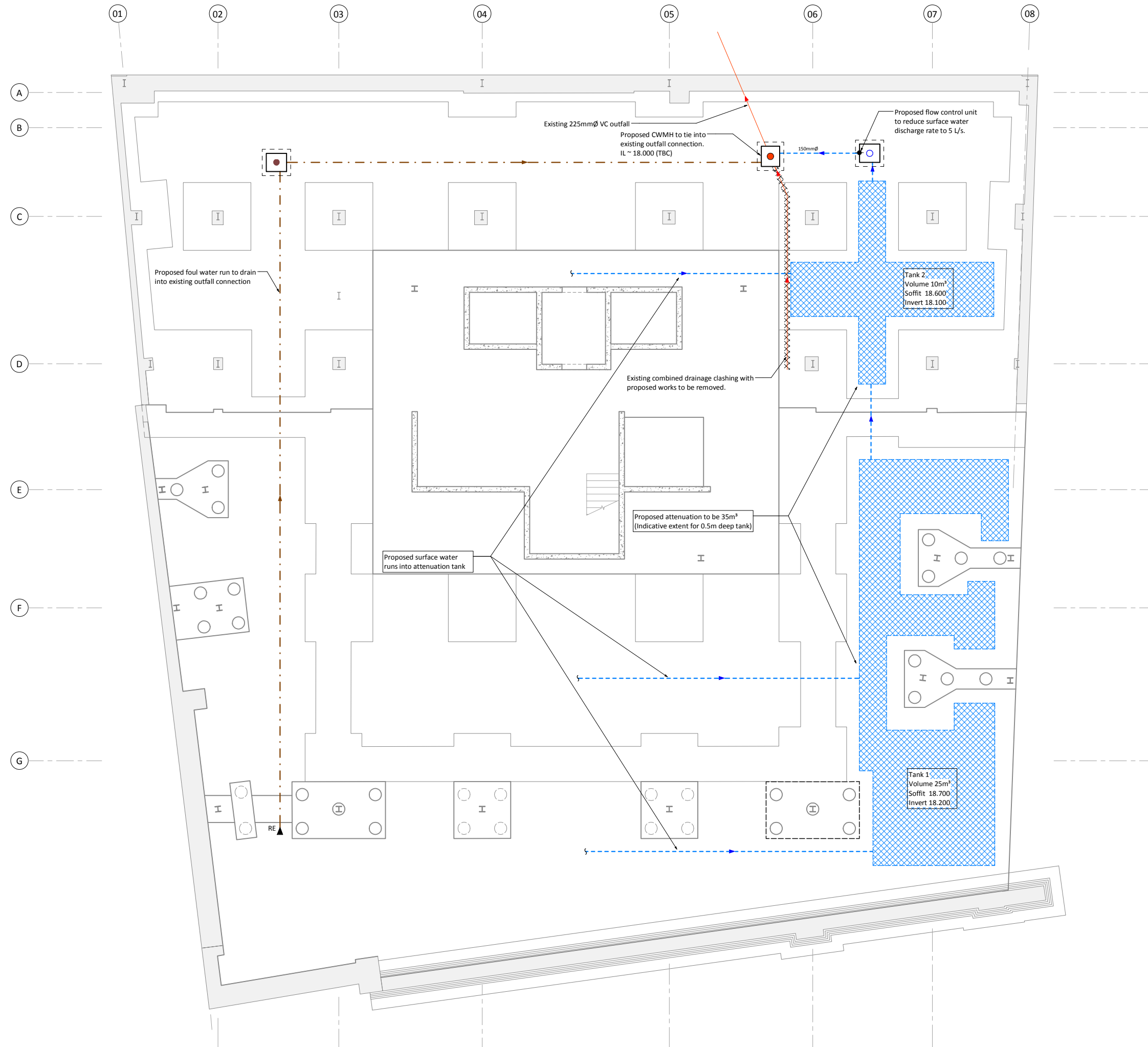
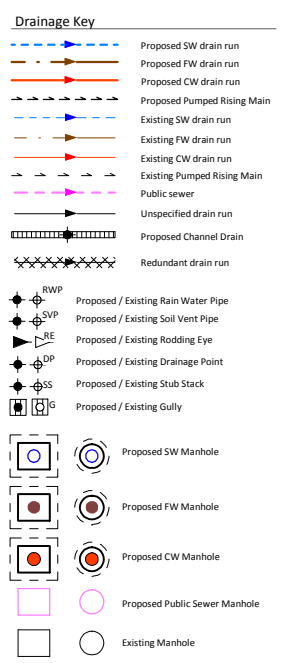


Appendix E

Proposed Drainage Layout



- This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.
- Do not scale from this drawing in either paper or digital form. Use written dimensions only. To check drawing has been printed to the intended scale the above bar should be 100mm
- Abbreviations:-
 - CL - Cover Level
 - IL - Invert Level
 - MH - Manhole
 - OD - Outer Diameter
 - RWP - Rainwater Pipe
 - SVP - Soil Vent Pipe
- Existing drainage extracted from CCTV survey issued by JPD on 12/09/2016.



P1	21.03.18	RG	RG	Preliminary
Rev	Date	By	Eng	Amendments




Job Name
296-302 Lincoln House
 High Holborn, WC1

Drawing Title
Proposed Drainage Layout

Appendix F

Hydraulic Calculations


Heyne Tillett Steel		Page 1
4 Pear Tree Court London EC1R 0DS	1392 - Lincoln House Surface Water Attenuation 1:100 year+40%CC at 5 L/s	
Date 15/03/2018 File 1IN100+40CC-35M3-5LPS.SRCX	Designed by RG Checked by RG	
XP Solutions	Source Control 2017.1.2	

Summary of Results for 100 year Return Period (+40%)

Half Drain Time : 60 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max E (l/s)	Max Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	18.534	0.334	0.0	5.0	5.0	5.0	23.5	O K
30 min Summer	18.597	0.397	0.0	5.0	5.0	5.0	27.9	O K
60 min Summer	18.608	0.408	0.0	5.0	5.0	5.0	28.7	O K
120 min Summer	18.573	0.373	0.0	5.0	5.0	5.0	26.2	O K
180 min Summer	18.534	0.334	0.0	5.0	5.0	5.0	23.5	O K
240 min Summer	18.493	0.293	0.0	5.0	5.0	5.0	20.6	O K
360 min Summer	18.418	0.218	0.0	5.0	5.0	5.0	15.3	O K
480 min Summer	18.355	0.155	0.0	5.0	5.0	5.0	10.9	O K
600 min Summer	18.305	0.105	0.0	5.0	5.0	5.0	7.4	O K
720 min Summer	18.267	0.067	0.0	4.9	4.9	4.9	4.7	O K
960 min Summer	18.219	0.019	0.0	4.8	4.8	4.8	1.3	O K
1440 min Summer	18.200	0.000	0.0	4.0	4.0	4.0	0.0	O K
2160 min Summer	18.200	0.000	0.0	2.9	2.9	2.9	0.0	O K
2880 min Summer	18.200	0.000	0.0	2.2	2.2	2.2	0.0	O K
4320 min Summer	18.200	0.000	0.0	1.6	1.6	1.6	0.0	O K
5760 min Summer	18.200	0.000	0.0	1.3	1.3	1.3	0.0	O K
7200 min Summer	18.200	0.000	0.0	1.1	1.1	1.1	0.0	O K
8640 min Summer	18.200	0.000	0.0	0.9	0.9	0.9	0.0	O K
10080 min Summer	18.200	0.000	0.0	0.8	0.8	0.8	0.0	O K
15 min Winter	18.583	0.383	0.0	5.0	5.0	5.0	27.0	O K


Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	145.922	0.0	28.3	17
30 min Summer	94.461	0.0	36.8	31
60 min Summer	58.167	0.0	45.5	58
120 min Summer	34.602	0.0	54.1	88
180 min Summer	25.209	0.0	58.9	122
240 min Summer	20.026	0.0	62.3	154
360 min Summer	14.441	0.0	67.5	218
480 min Summer	11.451	0.0	71.6	280
600 min Summer	9.559	0.0	74.5	338
720 min Summer	8.244	0.0	77.2	394
960 min Summer	6.523	0.0	81.4	502
1440 min Summer	4.683	0.0	87.7	0
2160 min Summer	3.357	0.0	94.3	0
2880 min Summer	2.649	0.0	99.2	0
4320 min Summer	1.894	0.0	106.4	0
5760 min Summer	1.492	0.0	111.7	0
7200 min Summer	1.239	0.0	116.0	0
8640 min Summer	1.065	0.0	119.6	0
10080 min Summer	0.936	0.0	122.7	0
15 min Winter	145.922	0.0	31.8	17

Heyne Tillett Steel		Page 2
4 Pear Tree Court London EC1R 0DS	1392 - Lincoln House Surface Water Attenuation 1:100 year+40%CC at 5 L/s	
Date 15/03/2018 File 1IN100+40CC-35M3-5LPS.SRCX	Designed by RG Checked by RG	
XP Solutions	Source Control 2017.1.2	

Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max E (l/s)	Max Outflow (l/s)	Max Volume (m³)	Status
30 min Winter	18.665	0.465	0.0	5.0	5.0	5.0	32.7	O K
60 min Winter	18.696	0.496	0.0	5.0	5.0	5.0	34.9	O K
120 min Winter	18.644	0.444	0.0	5.0	5.0	5.0	31.2	O K
180 min Winter	18.584	0.384	0.0	5.0	5.0	5.0	27.0	O K
240 min Winter	18.520	0.320	0.0	5.0	5.0	5.0	22.5	O K
360 min Winter	18.405	0.205	0.0	5.0	5.0	5.0	14.4	O K
480 min Winter	18.315	0.115	0.0	5.0	5.0	5.0	8.1	O K
600 min Winter	18.251	0.051	0.0	4.9	4.9	4.9	3.6	O K
720 min Winter	18.211	0.011	0.0	4.7	4.7	4.7	0.8	O K
960 min Winter	18.200	0.000	0.0	4.0	4.0	4.0	0.0	O K
1440 min Winter	18.200	0.000	0.0	2.9	2.9	2.9	0.0	O K
2160 min Winter	18.200	0.000	0.0	2.1	2.1	2.1	0.0	O K
2880 min Winter	18.200	0.000	0.0	1.6	1.6	1.6	0.0	O K
4320 min Winter	18.200	0.000	0.0	1.2	1.2	1.2	0.0	O K
5760 min Winter	18.200	0.000	0.0	0.9	0.9	0.9	0.0	O K
7200 min Winter	18.200	0.000	0.0	0.8	0.8	0.8	0.0	O K
8640 min Winter	18.200	0.000	0.0	0.7	0.7	0.7	0.0	O K
10080 min Winter	18.200	0.000	0.0	0.6	0.6	0.6	0.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
30 min Winter	94.461	0.0	41.2	31
60 min Winter	58.167	0.0	51.0	60
120 min Winter	34.602	0.0	60.3	96
180 min Winter	25.209	0.0	66.0	132
240 min Winter	20.026	0.0	70.2	168
360 min Winter	14.441	0.0	75.5	234
480 min Winter	11.451	0.0	79.9	292
600 min Winter	9.559	0.0	83.5	344
720 min Winter	8.244	0.0	86.3	390
960 min Winter	6.523	0.0	91.2	0
1440 min Winter	4.683	0.0	98.2	0
2160 min Winter	3.357	0.0	105.6	0
2880 min Winter	2.649	0.0	111.1	0
4320 min Winter	1.894	0.0	119.1	0
5760 min Winter	1.492	0.0	125.1	0
7200 min Winter	1.239	0.0	129.9	0
8640 min Winter	1.065	0.0	133.9	0
10080 min Winter	0.936	0.0	137.4	0

Heyne Tillett Steel		Page 3
4 Pear Tree Court London EC1R 0DS	1392 - Lincoln House Surface Water Attenuation 1:100 year+40%CC at 5 L/s	
Date 15/03/2018	Designed by RG	
File 1IN100+40CC-35M3-5LPS.SRCX	Checked by RG	
XP Solutions	Source Control 2017.1.2	

Rainfall Details


Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	20.500	Shortest Storm (mins)	15
Ratio R	0.433	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.104

Time (mins) Area
From: To: (ha)

0 4 0.104

Heyne Tillett Steel		Page 4
4 Pear Tree Court London EC1R 0DS	1392 - Lincoln House Surface Water Attenuation 1:100 year+40%CC at 5 L/s	
Date 15/03/2018	Designed by RG	
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XP Solutions	Source Control 2017.1.2	

Model Details

Storage is Online Cover Level (m) 19.000

Cellular Storage Structure

Invert Level (m) 18.200 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	74.0	0.0	0.501	0.0	0.0
0.500	74.0	0.0			

Hydro-Brake® Optimum Outflow Control


Unit Reference MD-SHE-0105-5000-1000-5000
Design Head (m) 1.000
Design Flow (l/s) 5.0
Flush-Flo™ Calculated
Objective Minimise upstream storage
Application Surface
Sump Available Yes
Diameter (mm) 105
Invert Level (m) 18.040
Minimum Outlet Pipe Diameter (mm) 150
Suggested Manhole Diameter (mm) 1200

Control Points **Head (m) Flow (l/s)**

Design Point (Calculated)	1.000	5.0
Flush-Flo™	0.296	5.0
Kick-Flo®	0.637	4.1
Mean Flow over Head Range	-	4.3

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)
0.100	3.6	1.200	5.4	3.000	8.4	7.000	12.5
0.200	4.8	1.400	5.8	3.500	9.0	7.500	12.9
0.300	5.0	1.600	6.2	4.000	9.6	8.000	13.3
0.400	4.9	1.800	6.6	4.500	10.1	8.500	13.7
0.500	4.7	2.000	6.9	5.000	10.6	9.000	14.1
0.600	4.3	2.200	7.2	5.500	11.1	9.500	14.5
0.800	4.5	2.400	7.5	6.000	11.6		
1.000	5.0	2.600	7.8	6.500	12.1		


Heyne Tillett Steel		Page 1
4 Pear Tree Court London EC1R 0DS	Lincoln House Surface Water Attenuation 1:100 year+40%CC at 5L/s	
Date 20/03/2018	Designed by RG	
File 180320-Split tanks 35m3...	Checked by RG	
XP Solutions	Network 2017.1.2	

Time Area Diagram for Storm

Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.077	4-8	0.027

Total Area Contributing (ha) = 0.104

Total Pipe Volume (m³) = 1.353

Heyne Tillett Steel		Page 2
4 Pear Tree Court London EC1R 0DS	Lincoln House Surface Water Attenuation 1:100 year+40%CC at 5L/s	
Date 20/03/2018	Designed by RG	
File 180320-Split tanks 35m3...	Checked by RG	
XP Solutions	Network 2017.1.2	

STORM SEWER DESIGN by the Modified Rational Method

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 (mm)	DIA (mm)	Section Type	Auto Design
1.000	22.000	0.500	44.0	0.064	5.00	0.0	0.600	o	225	Pipe/Conduit	⚠
1.001	2.785	0.100	27.9	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	⚠
2.000	20.000	0.500	40.0	0.040	5.00	0.0	0.600	o	150	Pipe/Conduit	⚠
1.002	1.000	0.001	1000.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	⚠
1.003	3.300	0.165	20.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	⚠


Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	E I.Area (ha)	E Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.000	50.00	5.19	18.700	0.064	0.0	0.0	0.0	1.98	78.6	8.7
1.001	50.00	5.21	18.200	0.064	0.0	0.0	0.0	1.92	33.8	8.7
2.000	50.00	5.21	18.600	0.040	0.0	0.0	0.0	1.60	28.2	5.4
1.002	50.00	5.26	18.100	0.104	0.0	0.0	0.0	0.31	5.5<	14.1
1.003	50.00	5.29	18.100	0.104	0.0	0.0	0.0	2.26	40.0	14.1

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)
1.003		19.190	17.935	0.000	225	0



Heyne Tillett Steel		Page 3
4 Pear Tree Court London EC1R 0DS	Lincoln House Surface Water Attenuation 1:100 year+40%CC at 5L/s	
Date 20/03/2018 File 180320-Split tanks 35m3...	Designed by RG Checked by RG	
XP Solutions	Network 2017.1.2	

Online Controls for Storm


Hydro-Brake® Optimum Manhole: 5, DS/PN: 1.003, Volume (m³): 1.2

Unit Reference	MD-SHE-0105-5000-1000-5000
Design Head (m)	1.000
Design Flow (l/s)	5.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	105
Invert Level (m)	18.100
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.000	5.0
Flush-Flo™	0.296	5.0
Kick-Flo®	0.637	4.1
Mean Flow over Head Range	-	4.3

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)
0.100	3.6	1.200	5.4	3.000	8.4	7.000	12.5
0.200	4.8	1.400	5.8	3.500	9.0	7.500	12.9
0.300	5.0	1.600	6.2	4.000	9.6	8.000	13.3
0.400	4.9	1.800	6.6	4.500	10.1	8.500	13.7
0.500	4.7	2.000	6.9	5.000	10.6	9.000	14.1
0.600	4.3	2.200	7.2	5.500	11.1	9.500	14.5
0.800	4.5	2.400	7.5	6.000	11.6		
1.000	5.0	2.600	7.8	6.500	12.1		

Heyne Tillett Steel		Page 4
4 Pear Tree Court London EC1R 0DS	Lincoln House Surface Water Attenuation 1:100 year+40%CC at 5L/s	
Date 20/03/2018 File 180320-Split tanks 35m3...	Designed by RG Checked by RG	
XP Solutions	Network 2017.1.2	

Storage Structures for Storm

Cellular Storage Manhole: 2, DS/PN: 1.001


Invert Level (m)	18.200	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)
0.000	53.5	0.0	0.501	0.0	0.0
0.500	53.5	0.0			

Cellular Storage Manhole: 4, DS/PN: 1.002

Invert Level (m)	18.100	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)
0.000	20.5	0.0	0.501	0.0	0.0
0.500	20.5	0.0			

Heyne Tillett Steel		Page 5
4 Pear Tree Court London EC1R 0DS	Lincoln House Surface Water Attenuation 1:100 year+40%CC at 5L/s	
Date 20/03/2018 File 180320-Split tanks 35m3...	Designed by RG Checked by RG	
XP Solutions	Network 2017.1.2	

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 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 Storage Structures 2
Number of Online Controls 1 Number of Time/Area Diagrams 0
Number of Offline Controls 0 Number of Real Time Controls 0

Synthetic Rainfall Details


Rainfall Model FSR Ratio R 0.442
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 20.700 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, 2160, 2880, 4320, 5760,
7200, 8640, 10080
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%					18.755
1.001	2	30 Winter	1	+0%	30/15 Winter				18.251
2.000	3	15 Winter	1	+0%	100/15 Summer				18.648
1.002	4	30 Winter	1	+0%	30/15 Summer				18.247
1.003	5	30 Winter	1	+0%	30/15 Summer				18.245

PN	US/MH Name	Depth (m)	Surcharged Volume (m³)	Flooded Flow / Cap. (l/s)	Pipe Overflow (l/s)	Pipe Flow (l/s)	Pipe Status	Level
								Exceeded
1.000	1	-0.170	0.000	0.13		9.5	OK	
1.001	2	-0.099	0.000	0.25		5.0	OK	
2.000	3	-0.102	0.000	0.22		5.9	OK	
1.002	4	-0.003	0.000	0.44		4.7	OK	
1.003	5	-0.005	0.000	0.18		4.6	OK	

Heyne Tillett Steel		Page 6
4 Pear Tree Court London EC1R 0DS	Lincoln House Surface Water Attenuation 1:100 year+40%CC at 5L/s	
Date 20/03/2018 File 180320-Split tanks 35m3...	Designed by RG Checked by RG	
XP Solutions	Network 2017.1.2	

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 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 Storage Structures 2
Number of Online Controls 1 Number of Time/Area Diagrams 0
Number of Offline Controls 0 Number of Real Time Controls 0

Synthetic Rainfall Details


Rainfall Model FSR Ratio R 0.442
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 20.700 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, 2160, 2880, 4320, 5760,
7200, 8640, 10080
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%					18.789
1.001	2	60 Winter	30	+0%	30/15 Winter				18.396
2.000	3	15 Winter	30	+0%	100/15 Summer				18.680
1.002	4	60 Winter	30	+0%	30/15 Summer				18.393
1.003	5	60 Winter	30	+0%	30/15 Summer				18.403

PN	US/MH Name	Depth (m)	Surcharged Volume (m³)	Flooded Flow / Cap. (l/s)	Pipe Overflow (l/s)	Pipe Flow (l/s)	Pipe Status	Level
								Exceeded
1.000	1	-0.136	0.000	0.33		23.3	OK	
1.001	2	0.046	0.000	0.23		4.5	SURCHARGED	
2.000	3	-0.070	0.000	0.55		14.6	OK	
1.002	4	0.143	0.000	0.50		5.4	SURCHARGED	
1.003	5	0.153	0.000	0.19		5.0	SURCHARGED	

Heyne Tillett Steel		Page 7
4 Pear Tree Court London EC1R 0DS	Lincoln House Surface Water Attenuation 1:100 year+40%CC at 5L/s	
Date 20/03/2018	Designed by RG	
File 180320-Split tanks 35m3...	Checked by RG	
XP Solutions	Network 2017.1.2	

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 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 Storage Structures 2
Number of Online Controls 1 Number of Time/Area Diagrams 0
Number of Offline Controls 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.442
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 20.700 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, 2160, 2880, 4320, 5760,
7200, 8640, 10080
Return Period(s) (years) 1, 30, 100
Climate Change (%) 0, 0, 40

US/MH	Return	Climate	First (X)	First (Y)	First (Z)	Overflow	Water		
PN	Name	Storm	Period	Change	Surcharge	Flood	Overflow	Act.	Level
1.000	1	15 Winter	100	+40%					18.826
1.001	2	60 Winter	100	+40%	30/15 Winter				18.698
2.000	3	15 Winter	100	+40%	100/15 Summer				18.830
1.002	4	60 Winter	100	+40%	30/15 Summer				18.712
1.003	5	120 Winter	100	+40%	30/15 Summer				18.725

PN	US/MH	Name	Surcharged		Flooded		Pipe		Level Exceeded
			Depth (m)	Volume (m ³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	
1.000	1		-0.099	0.000	0.59		42.6	OK	
1.001	2		0.348	0.000	0.22		4.4	SURCHARGED	
2.000	3		0.080	0.000	0.91		24.1	SURCHARGED	
1.002	4		0.462	0.000	0.52		5.7	SURCHARGED	
1.003	5		0.475	0.000	0.19		5.0	SURCHARGED	

Appendix G

Inspection and Maintenance
Strategy

Inspection and Maintenance Strategy

This document has been prepared to support the inspection and maintenance of the proposed below ground drainage of the Lincoln House development. The drainage network comprises surface and foul water drainage systems:

- Surface water network will route all the rainwater downpipes to the attenuation system with a limited discharge into the existing outfall.
- Foul network will discharge by gravity into the existing outfall.

In accordance with CIRIA C625 it is recommended that a private SuDS maintenance strategy is agreed as a simple contract between the property owner/ tenant (customer) and the maintenance provider (the maintainer). It is mainly to facilitate continuing maintenance of the SuDS that are in private ownership. The maintenance requirements are in accordance with the CIRIA C753 SuDS Manual 2015. The following Drainage / SuDS measures are proposed within the development:

- **Inlets, Outlets and Inspection Chambers:**

Maintenance Period	Maintenance Task	Frequency
Occasional maintenance	Inspect surface structures removing obstructions and silt as necessary. Check there is no physical damage. Remove vegetation 1m min. surround to structures and keep hard aprons free from silt and debris.	Monthly or as required
	Remove cover and inspect ensuring water is flowing freely and that the exit route for water is unobstructed. Remove debris and silt. Undertake inspection after leaf fall in autumn.	Annually

- **Geocellular attenuation tank:**

Maintenance Period	Maintenance Task	Frequency
Regular Maintenance	Inspect and identify any areas that are not operating correctly. If required, take remedial action	Monthly for 3 months, then six monthly
	Debris removal from silt trap manholes	Six monthly or after large storms
Remedial Action	Repair / rehabilitation of inlets, outlets, overflows and vents	As required
Monitoring	Inspect / check all inlets, outlets, vents and silt traps to ensure that they are in good condition and operating as designed.	Annually or after large storms

- **Flow control unit:**

Maintenance Period	Maintenance Task	Frequency
Occasional maintenance	Inspect flow control unit and chamber to remove any existing blockages or debris.	Bi-annually

Reference shall be made to CIRIA publication C753 (The SuDS Manual) and to the relevant maintenance guidance from the products manufacturers.

Appendix H

Pre-development Enquiry



Mr. Marcelo Silva
4 Pear Tree Court
London
EC1R 0DS



Your account number
DS6026757



Developer.services@thameswater
.co.uk



0800 009 3921

Mon – Fri 9am-5pm,

28th December 2016

Pre Development Enquiry

Site Address: 296-302 LINCOLN HOUSE, WC1V 7QR

Development Details: Existing site 0.1025ha, 5623m² of offices, foul discharge by pump 5.43l/s surface water 80l/s for 1 in 100. Proposed development 7608m² of offices proposed foul discharge 6.5l/s into existing connection in high Holborn sewer proposed surface water 39.7l/s for 1 in 100

Dear Mr. Silva,

I write in relation to the above site regarding the proposed development here. We have completed the assessment of your application, in relation to the sewers capacity. At this stage your proposal is accepted, we issue an approval letter for you to progress with your development.

Foul Water

From the information you have provided, I can confirm that the existing foul sewer network does have sufficient capacity to accommodate the proposed foul water discharge from the proposed development.

Surface Water

Please note that discharging surface water to the public sewer network should only be considered after all other methods of disposal have been investigated and proven to not be viable. In accordance with the Building Act 2000 Clause H3.3, positive connection to a public sewer will only be consented when it can be demonstrated that the hierarchy of disposal methods have been examined and proven to be impracticable. The disposal hierarchy being: 1st Soakaways; 2nd Watercourses; 3rd Sewers.

Discharges shall be attenuated to reduce the likelihood of flooding downstream of the point of connection. As a guide a discharge rate of 5 litres/second/Hectare will be use in most instances, however more onerous constraints may be imposed to fit local circumstances. The system shall not show signs of flooding above ground for the worst 1 in 30 year storm, and shall be tested for exceedance in a 1 in 100 year storm to demonstrate any flooding that may occur will not flood properties.

All connection requests are subject to a full Section 106 (Water Industry Act 1991) application before the Company can confirm approval to the connection itself. Please also note that capacity in the public sewerage system cannot be reserved.

The views expressed by Thames Water in this letter are in response to this pre development enquiry at this time and do not represent our final views on any future planning applications made in relation to this site.

Yours sincerely

David Stamateris
Development Engineer

Registered address: Thames Water Utilities Limited, Clearwater Court, Vastern Road, Reading RG1 8DB

Please Note: Company Number 02366661 Thames Water Utilities Limited is part of the Thames Water Plc group. VAT registration no GB 537-4569-15

