





 This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.

100mm @ A0 (50mm @ A2

- 3 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
- 3 Abbreviations:-

CL	- Cover Level
IL	 Invert Level
MH	- Manhole
OD	- Outer Diameter
RWP	- Rainwater Pipe
SVP	- Soil Vent Pipe

4 Existing drainage extracted from CCTV survey issued by JPD on 12/09/2016.

Drainage Key

*		Proposed SW drain run
>		Proposed FW drain run
		Proposed CW drain run
<u></u>		Proposed Pumped Rising Main
		Existing SW drain run
- · -•		Existing FW drain run
		Existing CW drain run
	~ ~	Existing Pumped Rising Main
		Public sewer
		Unspecified drain run
	EIIIIII	Proposed Channel Drain
~~~~*	~~~~	Redundant drain run
RWP	Bronorod	/ Existing Pain Water Dine
L ASVP	Proposed	/ Existing Soil Vent Pine
RE	Deserved	/ Guinting Daviding Gun
	Proposed	/ Existing Kodding Eye
• -ф ^{ор}	Proposed	/ Existing Drainage Point
🔶 -фss	Proposed	/ Existing Stub Stack
e 🗗	Proposed	/ Existing Gully
0	(Ô)	Proposed SW Manhole
	(Ô)	Proposed FW Manhole
	(Ô)	Proposed CW Manhole
	\bigcirc	Proposed Public Sewer Manhole
	\bigcirc	Existing Manhole

P1 21.03.18 RG RG Preliminary Rev Date By Eng Amendments



STRUCTURAL ENGINEERS

^{Job Name} 296-302 Lincoln House High Holborn, WC1

Drawing Title Proposed Drainage Layout

Drawing No	1392/0	DR099	Rev	Р1
Purpose of Issue	Preliminary	Scale at A0		1:50





Heyne Tillett Steel							Page 1	
4 Pear Tree Court		13	92 - Lin	coln Hous	se			
London		Su	rface Wa	ter Atter	nuation		4	
EC1R ODS		11:	100 vear	+40%CC at	- 5 L/s		~	m
Date 15/03/2018			signed h	v RG	5 5 2,5		MICLO	
$E_{10} = 11N100 + 40CC - 2EM^{2}$	2 SIDC C	PCV Ch	acked by	PC			Drain	ade
VD Gelations	3-311-3.3		ecked by	KG	7 1 0			1
XP SOLUCIONS		50	urce con	LIFOI 2017	/.1.2			
Commonser of	f Decul	+ <i>a</i> f a m	100	Deturn	Densied (. 108.)		
Summary of	DI Resul	ts ior	100 year	Return I	Period (+408)		
	Hal	f Drain	Time : 60	minutes.				
Storm	Max N	Max	Max	Max	Max	Max	Status	
Event	Level De	eptn infi (m)	(1/a)	Control Σ	Outflow (1/a)	Volume		
	(m)	(m)	(1/S)	(1/8)	(1/8)	(m ³)		
15 min Summer	18.534 0	.334	0.0	5.0	5.0	23.5	ΟK	
30 min Summer	18.597 0	.397	0.0	5.0	5.0	27.9	O K	
60 min Summer	18.608 0	.408	0.0	5.0	5.0	28.7	ΟK	
120 min Summer	18.573 0	.373	0.0	5.0	5.0	26.2	ΟK	
180 min Summer	18.534 0	.334	0.0	5.0	5.0	23.5	ΟK	
240 min Summer	18.493 0	.293	0.0	5.0	5.0	20.6	ОК	
360 min Summer	18.418 0	.218	0.0	5.0	5.0	15.3	ΟK	
480 min Summer	18.355 0	.155	0.0	5.0	5.0	10.9	ΟK	
600 min Summer	18.305 0	.105	0.0	5.0	5.0	7.4	ΟK	
720 min Summer	18.267 0	.067	0.0	4.9	4.9	4.7	ΟK	
960 min Summer	18.219 0	.019	0.0	4.8	4.8	1.3	ΟK	
1440 min Summer	18.200 0	.000	0.0	4.0	4.0	0.0	ΟK	
2160 min Summer	18.200 0	.000	0.0	2.9	2.9	0.0	ΟK	
2880 min Summer	18.200 0	.000	0.0	2.2	2.2	0.0	ΟK	
4320 min Summer	18.200 0	.000	0.0	1.6	1.6	0.0	O K	
5760 min Summer	18.200 0	.000	0.0	1.3	1.3	0.0	O K	
7200 min Summer	18.200 0	.000	0.0	1.1	1.1	0.0	ΟK	
8640 min Summer	18.200 0	.000	0.0	0.9	0.9	0.0	O K	
10080 min Summer	18.200 0.	.000	0.0	0.8	0.8	0.0	O K	
15 min Winter	18.583 0	.383	0.0	5.0	5.0	27.0	ΟK	
	Storm	Rain	Flooded	l Discharge	e Time-Pea	ak		
	Event	(mm/hr	r) Volume	Volume	(mins)			
			(m³)	(m ³)				
15	min Summe	er 145.92	22 0.0	28.3	3	17		
30	min Summe	er 94.46	51 0.0	36.8	3	31		
60	min Summe	er 58.16	57 0.0	45.5	; !	58		
120	min Summe	er 34.60	0.0	54.1	. 1	38		
180	min Summe	er 25.20	0.0	58.9	1	22		
240	min Summe	er 20.02	26 0.0	62.3	1	54		
360	min Summe	er 14.44	łl 0.0	67.5	5 23	18		
480	min Summe	er 11.45	51 0.0) 71.6	2	30		
600	min Summe	er 9.55	59 0.0) 74.5	3	38		
720	min Summe	er 8.24	14 0.0) 77.2	3	94		
960	min Summe	er 6.52	23 0.0	81.4	5)2		
1440	min Summe	er 4.68	33 0.0	87.7	1	0		
2160	min Summe	er 3.35	57 0.0	94.3	3	0		
2880	min Summe	er 2.64	19 0.0	99.2	2	0		
4320	min Summe	er 1.89	94 0.0	106.4	Ł	0		
5760	min Summe	er 1.49	92 0.0) 111.7	1	0		
7200	min Summe	er 1.23	89 0.0) 116.0)	0		
8640	min Summe	er 1.06	55 0.0) 119.6	5	0		
10080	min Summe	er 0.93	36 0.0) 122.7	1	0		
15	min Winte	er 145.92	22 0.0) 31.8		L7		
	~ ~ ~	000 000		1				
	©1	982-201	l/ XP So	lutions				

Heyne Tillett Steel									Page	2	
4 Pear Tree	e Court			1392	? - Lin	coln Ho	ouse	е			
London Surface Water Attenuation									4		
EC1R ODS 1:100 year+40%CC at 5 L/s							Mice	m			
Date 15/03/	2018			Desi	aned b	v RG				MIL	U
File 1IN100	+40CC-35	M3-5LPS	.SRCX	Chec	ked by	RG				Drai	nage
XP Solution	IS			Sour	ce Con	trol 20)17	1.2			
	Summary	of Res	ults f	or 10)0 year	Return	ı Pe	eriod	(+40%)	
										-	
	Storm	Max	Max	M	lax	Max		Max	Max	Status	
	Event	Level	Depth	Infil	tration	Control	ΣΟ	Outflow	Volume		
		(m)	(m)	(1	/s)	(1/s)	((l/s)	(m³)		
30	min Winter	18.665	0.465		0.0	5.0		5.0	32.7	ОК	
60	min Winter	18.696	0.496		0.0	5.0		5.0	34.9	ОК	
120	min Winter	18.644	0.444		0.0	5.0		5.0	31.2	ΟK	
180	min Winter	18.584	0.384		0.0	5.0		5.0	27.0	ОК	
240	min Winter	18.520 r 18 405	0.320		0.0	5.0		5.0	22.5 14 4	O K O K	
480	min Winter	18.315	0.115		0.0	5.0		5.0	8.1	O K	
600	min Winter	18.251	0.051		0.0	4.9		4.9	3.6	ОК	
720	min Winter	18.211	0.011		0.0	4.7		4.7	0.8	O K	
960	min Winter	18.200	0.000		0.0	4.0		4.0	0.0	ОК	
2160	min Winter	18.200 18.200	0.000		0.0	2.9		2.9	0.0	0 K	
2880	min Winter	18.200	0.000		0.0	1.6		1.6	0.0	ОК	
4320	min Winter	18.200	0.000		0.0	1.2		1.2	0.0	ΟK	
5760	min Winter	18.200	0.000		0.0	0.9		0.9	0.0	O K	
7200	min Winter	18.200	0.000		0.0	0.8		0.8	0.0	ОК	
10080	min Winter	r 18.200 r 18.200	0.000		0.0	0.7		0.7	0.0	0 K	
10000		101200	0.000		0.0	0.0		0.0	010	0 10	
		Storm	I	Rain	Flooded	l Dischar	rge	Time-Pe	ak		
		Event	(11	m/nr)	(m ³)	(m ³)	e	(mins)		
					()	()					
	3	0 min Wi	nter 9	4.461	0.0) 41	1.2		31		
	6	U min Wi: O min Wi	nter 5	8.167	0.0) 51	L.O		60 96		
	12	0 min Wi	nter 2	5.209	0.0	, 60) 66	5.0	1	.32		
	24	0 min Wi	nter 2	0.026	0.0) 70).2	1	.68		
	36	0 min Wi	nter 1	4.441	0.0) 75	5.5	2	34		
	48	0 min Wi	nter 1	1.451	0.0) 79	9.9	2	92		
	60 70	U min Wi: O min Wi	nter	9.559	0.0	J 83	5.5	3	44		
	96	0 min Wi	nter	6.523	0.0	, 80) <u>9</u> 1	L.2	3	0		
	144	0 min Wi	nter	4.683	0.0) 98	3.2		0		
	216	0 min Wi	nter	3.357	0.0	105	5.6		0		
	288	0 min Wi	nter	2.649	0.0) 111	.1		0		
	432	U min Wi: O min Wi	nter	1 402	0.0) 119) 105	1.1		0		
	720	0 min Wi	nter	1.239	0.0	, 125) 129).1).9		0		
	864	0 min Wi	nter	1.065	0.0	133	3.9		0		
	1008	0 min Wi	nter	0.936	0.0) 137	7.4		0		
			©1982	-2017	XD Co	lutiona					
			J + J U 2		111 DO						





Heyne Tillett Steel	Page 3		Heyne Tillett Ste	el				1	Page 4
4 Pear Tree Court 1392 - Lincoln House		1	4 Pear Tree Court	;	1392 -	Lincoln Ho	ouse		
London Surface Water Attenuation	L.		London		Surface	Water Att	enuation		L
EC1R ODS 1:100 year+40%CC at 5 L/s	Micco		EC1R ODS		1:100 y	ear+40%CC	at 5 L/s		Micro
Date 15/03/2018 Designed by RG	Desinado		Date 15/03/2018		Designe	d by RG			Desinado
File 1IN100+40CC-35M3-5LPS.SRCX Checked by RG	Diamaye		File 1IN100+40CC-	35M3-5LPS.SRCX	Checked	by RG			Diamaye
XP Solutions Source Control 2017.1.2	·		XP Solutions		Source	Control 20	017.1.2		
Rainfall Details				1	Model Det	<u>tails</u>			
Rainfall ModelFSRWinter StormsReturn Period (years)100Cv (Summer) 0.7	Yes 750			Storage is Or	nline Cove	r Level (m)	19.000		
Region England and WalesCv (Winter) 0.8M5-60 (mm)20.500 Shortest Storm (mins)Batio R0.433 Longest Storm (mins) 100	840 15 080			<u>Cellula</u>	ar Storag	e Structu	re		
Summer Storms Yes Climate Change %	+40		Infilt	Inve ration Coefficient ration Coefficient	rt Level (Base (m/h Side (m/h	m) 18.200 ur) 0.00000 ur) 0.00000	Safety Fac Poros	tor 2.0 ity 0.95	
<u>Time Area Diagram</u>			Depth (m)	Area (m²) Inf. Ar	ea (m²) De	epth (m) Are	ea (m²) Inf	. Area (m	²)
IUCAL AFEA (IIA) 0.104			0.000	74.0	0.0	0.501	0.0	0	.0
Time (mins) Area			0.500	74.0	0.0				
From: To: (ha) 0 4 0.104				<u>Hydro-Brake@</u>	0 Optimum	1 Outflow (Control		
			Minim Sug The hydrological c Hydro-Brake@ Optim Hydro-Brake Optimu invalidated	Unit Desig Design Sum Dia Invert num Outlet Pipe Dia ggested Manhole Dia Control Po Design Point (C Mean Flow over S calculations have H num as specified. mm® be utilised the	t Reference gn Head (m Flow (1/s Flush-Flo' Objectiv Application p Available ameter (mm ameter (mm ameter (mm bints alculated) Flush-Flo® Head Range been based Should an en these s	<pre>e MD-SHE-01()) m e Minimise n e)) Head (m) F 1.000 0.296 0.637 e - on the Head other type of torage routi</pre>	Cald upstream s clow (1/s) 5.0 5.0 4.1 4.3 d/Discharge of control ing calcula	00-5000 1.000 5.0 pulated storage Surface Yes 105 18.040 150 1200 e relation device ot ations wil	ship for the her than a l be
			Depth (m) Flow (1	l/s) Depth (m) Flo	w (1/s) De	epth (m) Flo	w (1/s) De	epth (m) F	'low (l/s)
			0.100	3.6 1.200	5.4	3.000	8.4	7.000	12.5
			0.200	4.8 1.400 5.0 1.600	5.8	3.500	9.0 9.6	7.500	12.9 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
			1.000	5.0 2.600	7.8	6.500	12.1		
©1982-2017 XP Solutions				©1982	-2017 XP	Solutions			



пеуп	e Ti	llet	t St	eel						
4 Pe	ar T	ree	Cour	rt			Li	ncoln	Hous	se
Lond	on						Su	irface	Wate	er .
EC1R	0DS						1:	100 y	ear+4	10%
Date	20/	03/2	2018				De	esigne	d by	RG
File	180	320-	Spli	lt tan	lks	35m3.	Cł	lecked	by F	٤G
XP S	olut	ions	3				Ne	etwork	201	/.1
			STO	ORM SE	WEF	R DESI	GN by	the M	lodif	ied
					1	letwor	k Des:	ign Ta	ble :	for
						« - In	dicates	pipe	capaci	ity
PN	Lei (ngth m)	Fall (m)	1 Slog (1:)	pe K)	I.Area (ha)	T.E. (mins)	Ba Flow	se (l/s)] (1
1.00)0 22)1 2	.000 .785	0.50 0.10	0 44 0 27	.0 .9	0.064 0.000	5.00	1	0.0	0. 0.
2.00	0 20	.000	0.50	0 40	.0	0.040	5.00)	0.0	0.
1.00)2 1)3 3	.000 .300	0.00 0.16	1 1000 5 20	.0 .0	0.000 0.000	0.00)	0.0	0. 0.
						N	etwork	Resu	lts I	'ab
	PN	Ra (mm.	in /hr)	T.C. (mins)	US (3/IL Σ (m)	I.Area (ha)	ΣB Flow	ase (1/s)	Fc (1
-	L.000 L.001	5) 5)	0.00	5.19 5.21	18 18	.700 .200	0.064 0.064		0.0	
:	2.000	50	0.00	5.21	18	.600	0.040		0.0	
-	L.002 L.003	5(5(0.00	5.26 5.29	18 18	.100 .100	0.104 0.104		0.0	
				Fr	ee	Flowi	.ng Out	fall	Deta	ils
			Pi	Outfal pe Num	l ber	Outfa Name	11 C. I	evel I n)	. Leve (m)	e 1
				1.	003		19	.190	17.93	35
				1.	005		1.	. 190	1,.,.	,,,

Heyne Tillett Steel		Page 1
4 Pear Tree Court	Lincoln House	
London	Surface Water Attenuation	L.
EC1R 0DS	1:100 year+40%CC at 5L/s	Micro
Date 20/03/2018	Designed by RG	Drainago
File 180320-Split tanks 35m3	Checked by RG	Diamage
XP Solutions	Network 2017.1.2	
Time Are	ea Diagram for Storm	
Time (mins)	Area Time Area (mins) (ha)	
0-4	4-8 0.027	
Total Area	Contributing (ha) = 0.104	
Total Pi	pe Volume (m³) = 1.353	
©1982-	-2017 XP Solutions	

	Page 2
5	
Attenuation	L.
)%CC at 5L/s	Micro
RG	Desinado
3	Dialitage
1.2	

ed Rational Method

or Storm

```
y < flow
```

k	HYD	DIA	Section Type	Auto
(mm)	SECT	(mm)		Design
0.600	0	225	Pipe/Conduit	•
0.600	0	150	Pipe/Conduit	
0.600	0	150	Pipe/Conduit	•
0.600	0	150	Pipe/Conduit	•
0.600	0	150	Pipe/Conduit	

ble

Foul	Add Flow	Vel	Cap	Flow
(1/s)	(1/s)	(m/s)	(1/s)	(1/s)
0.0	0.0	1.98	78.6	8.7
0.0	0.0	1.92	33.8	8.7
0.0	0.0	1.60	28.2	5.4
0.0	0.0	0.31	5.5«	14.1
0.0	0.0	2.26	40.0	14.1

ls for Storm

L	Min	D,L	W
	I. Level (m)	(mm)	(mm)
5	0.000	225	0

cions



Heyne Tillett	Steel				Page 3	Heyne Tillett Steel	
4 Pear Tree Co	ourt	Lincolı	1 House			4 Pear Tree Court	Lincoln House
London		Surface	e Water At	tenuation	4	London	Surface Water
EC1R 0DS		1:100 -	/ear+40%CC	l at 5L/s	- Cm	EC1R ODS	1:100 year+40
Date 20/03/201	1.8	Designe	d by RG		MICLO	Date 20/03/2018	Designed by R
File 180320_Gr	olit tanka 35m	Checker	by PC		Drainage	Eile 180320-Snlit tanka 35m3	Checked by PG
VD Solutions		Notworl	2 Dy RG)	3	VD Colutions	Notwork 2017
AF SOLUCIOUS		Networ	1 2017.1.2				Network 2017.
	<u>On</u>	line Control	<u>s for Sto</u>	<u>rm</u>		<u>Storage</u>	Structures for
<u>Hydro-B</u> :	rake® Optimum	Manhole: 5,	DS/PN: 1.	003, Volume (m³): 1.2	<u>Cellular Stora</u>	age Manhole: 2,
		Unit Reference	ce MD-SHE-01	105-5000-1000-50	00	Inve	ert Level (m) 18.
		Design Head (r	n)	1.0	00	Infiltration Coefficient	t Base (m/hr) 0.00
	De	esign Flow (1/s	3)	5	.0	Infiltration Coefficient	t Side (m/hr) 0.00
		Flush-Flo	o™ ze Minimise	Calculat unstream stora	ed ge	Depth (m) area (m2) Inf a	rea (m²) Depth (m)
		Applicatio	on nitrituitse	Surfa	ce	Depch (m/ Area (m [*]) inr. A	
		Sump Availab	Le	Y	es	0.000 53.5	0.0 0.501
		Diameter (mr	n)	1	05	0.500 53.5	0.0
		Invert Level (r	n)	18.1	00		
М	Suggested Manhol	pe Diameter (mr le Diameter (mr	n)	1	50 00	<u>Cellular Stora</u>	age Manhole: 4,
	a		Hand (m)			Inve	ert Level (m) 18.
	Conti	FOI POINTS	Head (m)	FIOW (1/S)		Infiltration Coefficient	t Base (m/hr) 0.00 t Side (m/hr) 0.00
	Design Poi	nt (Calculated) 1.000	5.0			L DIGE (m/111) 0.00
		Flush-Flo Kick-Flo	■ 0.296 0.637	5.0 4.1		Depth (m) Area (m ²) Inf. An	rea (m²) Depth (m)
	Mean Flow	over Head Rang	e -	4.3		0 000 20 5	0.0 0.501
Hydro-Brake Op Hydro-Brake Op invalidated	ptimum as specif.	ed then these r	storage rout	ing calculation	s will be		
Deptn (m) Flo	w (1/s) Depth (m) FIOW (1/S) L	eptn (m) Fl	.ow (1/s) Depth	(m) FIOW (1/S)		
0.100	3.6 1.20	0 5.4	3.000	8.4 7.	000 12.5		
0.200	±.0 ±.40 5.0 1.60	0 6.2	4,000	9.6 A	000 13 3		
0.400	4.9 1.80	0 6.6	4.500	10.1 8.	500 13.7		
0.500	4.7 2.00	0 6.9	5.000	10.6 9.	000 14.1		
0.600	4.3 2.20	0 7.2	5.500	11.1 9.	500 14.5		
0.800	4.5 2.40	0 7.5	6.000	11.6			
1.000	5.0 2.60	0 7.8	6.500	12.1			
	C	1982-2017 XE	Solution	S		©1982	2-2017 XP Solut

	Page 4
louse	
ater Attenuation	L.
r+40%CC at $5L/s$	Micco
by RG	Desinado
y RG	Diamage
017.1.2	

for Storm

: 2, DS/PN: 1.001

18.200 Safety Factor 2.0 0.00000 Porosity 0.95 0.00000

n (m) Area (m²) Inf. Area (m²)

0.501 0.0 0.0

: 4, DS/PN: 1.002

) 18.100 Safety Factor 2.0 0.00000 Porosity 0.95 0.00000

(m) Area (m²) Inf. Area (m²)

0.501 0.0 0.0

olutions



Heyne Tillett	Steel					Page 5
4 Pear Tree C	ourt		Lincoln H	louse		
London			Surface V	Vater Atten	uation	L
EC1R 0DS			1:100 yea	ar+40%CC at	5L/s	Micro
Date 20/03/20	18		Designed	by RG		Dcainage
File 180320-S	plit tank	s 35m3	Checked b	by RG		Diamage
XP Solutions			Network 2	2017.1.2		
<u>l year Return</u>	n Period	Summary of	Critical for Stor	<u>Results by</u> <u>m</u>	<u>Maximum Le</u>	vel (Rank 1)
A Manhole He Foul Sew	real Reduct Hot St Hot Start adloss Coef age per hec	Sin Factor Fact (mins) Level (mm) f (Global) tare (l/s)	mulation Cri 1.000 Add: 0 0 0.500 Flow p 0.000	<u>iteria</u> itional Flow MADD Factor I per Person pe	- % of Total 1 * 10m³/ha Sto: nlet Coeffiec r Day (l/per/o	Flow 0.000 rage 2.000 ient 0.800 day) 0.000
Ν	Number of In Number of Number of (nput Hydrogr Online Cont Offline Cont	aphs 0 Numb rols 1 Numb rols 0 Numb	er of Storage er of Time/An er of Real Ti	e Structures 2 rea Diagrams (ime Controls (2))
	Rainfa M5	<u>Synthe</u> ll Model Region Eng -60 (mm)	tic Rainfal land and Wa 20.	<u>l Details</u> FSR Ratio les Cv (Summe 700 Cv (Winte	o R 0.442 er) 0.750 er) 0.840	
1	Margin for	Flood Risk W Analys	Warning (mm) sis Timester DTS Status	300.0 D Fine Inert ON	VD Status OFF ia Status OFF	
	Pr Duration(s	ofile(s)) (mins)	15, 30, 60 720, 960	, 120, 180, 2 , 1440, 2160,	Summer and W 240, 360, 480, 2880, 4320, 7200 8640	Jinter 600, 5760,
Return	n Period(s) Climate Ch	(years) ange (%)			1, 30 0,	0, 100 0, 40
US/MH PN Name	Rei Storm Pe:	turn Climate riod Change	First (X Surcharg) First (Y e Flood) First (Z) O Overflow	Water verflow Level Act. (m)
1.000 1 15	Winter	1 +0%				18.755
1.001 2 30	Winter	1 +0%	30/15 Win	ter		18.251
2.000 3 15	Winter	1 +0%	100/15 Sum	mer		18.648
1.002 4 30	Winter	1 +0%	30/15 Sum 30/15 Sum	mer		18.247
			a. a			
	US/MH D	charged Floc	aea me Flow /	Overflow Flo	e w T.e	avel
PN	Name	(m) (m	3) Cap.	(1/s) (1/s	s) Status Exc	eeded
	-	0 100 0	-	-	F	
1.000	1 2	-0.099 0	000 0.13	9	.5 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	
		©1982-	-2017 XP S	olutions		

Heyne	Tillet	t Steel							Page	e 6				
4 Pear	Tree	Court		:	Lincolı	n House								
London	L				Surface	e Water	Atten	uation	4	A				
EC1R 0	DS				1:100 3	year+40	%CC at	5L/s	1.45	Jun				
Date 2	0/03/2	2018		1	Design	ed by R	G			liu				
File 1	80320-	-Split ta	anks 35	m3	Checked	d by RG			Ula	iinage				
XP Sol	ution	5			Networl	< 2017.	1.2							
<u>30 yea</u>	ar Ret	urn Peri	od Summ	ary of	Critic	al Resu	ults by	/ Maximum	Level (i	<u>Rank 1)</u>				
					for St	orm								
Simulation Criteria														
		Areal Per	Nuction F	<u>Sim</u> Pactor 1	11ation 000 7	<u>Criteria</u>	L I Flow	- % of Tota	1 Flow 0	000				
		Hot	: Start (mins)	0	MADD	Factor	* 10m³/ha S	torage 2.	000				
		Hot Sta	art Level	(mm)	0		I	nlet Coeffi	ecient 0.	800				
Ma	anhole Foul S	Headloss (ewage per	Coeff (Gl hectare	obal) 0 (1/s) 0	.500 Flc .000	w per Pe	erson pe	r Day (l/pe	r/day) 0.	000				
		Number o	f Input 1	Hydrogra ne Contr	phs 0 N ols 1 M	umber of	Storage	Structures	s 2 s 0					
		Number	of Offli	ne Contr	ols 0 N	umber of	Real Ti	me Controls	s 0					
		De l	nfall M	Synthet	ic Rain	fall Deta	ails D-ti	D 0 440						
		Rai	niali Mo Reg	aei ion Engl	and and	Wales C	Ratic v (Summe	(r) = 0.442						
			M5-60 (1	mm)		20.700 C	v (Winte	er) 0.840						
		Margin f	or Flood	i Risk Wa	arning (mm) 300. ten Fin	U D'	VD Status O	FF					
				Analysi	DTS Sta	tus 0	N N	ia status U						
			Profile	(9)				Summer and	Winter					
		Duratio	n(s) (mi	ns)	15, 30,	60, 120	, 180, 2	40, 360, 48	30, 600,					
					720,	960, 1440	0, 2160,	2880, 4320), 5760,					
	Pot	urn Doriod	(a) (waa	r a)				7200, 8640), 10080					
	Ret	Climate	(S) (yea Change	(%)				1, (), 0, 40					
			2											
										Water				
DN	US/MH	Storm	Return	Climate	First	(X) F	irst (Y)) First (Z)	Overflow	Level				
PN	Name	SCOTI	Period	change	Surch	arge	F100a	Overliow	ACL.	(111)				
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 60 Winter	30	+0% +0%	30/15	Summer				18.680				
1.002	5	60 Winter	30	+0%	30/15	Summer				18.403				
		C	raharaa 3	Flooded			Ding							
		SU US/MH	Depth	Volume	Flow /	Overflo	w Flow		Level					
	PN	Name	(m)	(m ³)	Cap.	(1/s)	(1/s)	Status	Exceeded					
		_			-	-								
	1 001	1	-0.136	0.000	0.33		23.3	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						
L				©1982-2	2017 XE	Solut	ions							



Heyne Tillett Steel	Page 7	
4 Pear Tree Court	Lincoln House	
London	Surface Water Attenuation	
EC1R 0DS	1:100 year+40%CC at 5L/s	~
Date 20/03/2018	Designed by RG	
File 180320-Split tanks 35m3	Checked by RG UIdlid	P
XP Solutions	Network 2017.1.2	
<u>100 year Return Period Summary</u> Sir Areal Reduction Factor J Hot Start (mins) Hot Start Level (mm) Manhole Headloss Coeff (Global) (of Critical Results by Maximum Level (Ran) 1) for Storm mulation Criteria 1.000 Additional Flow - % of Total Flow 0.000 0 MADD Factor * 10m ³ /ha Storage 2.000 0 Inlet Coefficient 0.800 0.500 Flow per Person per Day (1/per/day) 0.000	μ
Foul Sewage per hectare (l/s) (Number of Input Hydrogr. Number of Online Cont: Number of Offline Cont:	0.000 caphs 0 Number of Storage Structures 2 crols 1 Number of Time/Area Diagrams 0 crols 0 Number of Real Time Controls 0	
<u>Synthe</u> Rainfall Model Region Eng M5-60 (mm) Margin for Flood Risk W	etic Rainfall Details FSR Ratio R 0.442 gland and Wales Cv (Summer) 0.750 20.700 Cv (Winter) 0.840 Warning (mm) 300.0 DVD Status OFF	
Profile(s) Duration(s) (mins) Return Period(s) (years) Climate Change (%)	Summer and Winter 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080 1, 30, 100 0, 0, 40	
	Wate	r
PN Name Storm Period Change	e First (X) First (Y) First (Z) Overflow Leve e Surcharge Flood Overflow Act. (m)	эт
1.000 1 15 Winter 100 +403 1.001 2 60 Winter 100 +403 2.000 3 15 Winter 100 +403 1.002 4 60 Winter 100 +403 1.003 5 120 Winter 100 +403	% 18.82 % 30/15 Winter % 100/15 Summer % 30/15 Summer % 30/15 Summer % 30/15 Summer % 30/15 Summer	26 98 30 12 25
Surcharged Floode US/MH Depth Volume PN Name (m) (m³)	ed Pipe e Flow / Overflow Flow Level Cap. (l/s) (l/s) Status Exceeded	
1.000 1 -0.099 0.00	00 0.59 42.6 OK	
2.000 3 0.080 0.00	0 0.91 24.1 SURCHARGED	
1.002 4 0.462 0.00 1.003 5 0.475 0.00	00 0.52 5.7 SURCHARGED 00 0.19 5.0 SURCHARGED	
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Appendix G Inspection and Maintenance Strategy



1392 – Lincoln House March 2018



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	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
maintenance	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	Inspect and identify any areas that are not operating correctly. If required, take remedial action	Monthly for 3 months, then six monthly
Maintenance	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





9

Mr. Marcelo Silva 4 Pear Tree Court London EC1R 0DS Developer.services@thameswater .co.uk

Your account number

DS6026757

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.

Registered address: Thames Water Utilities Limited, Clearwater Court, Vastern Road, Reading RG1 8DB Pleaman Mather 02366661 Thames Water Utilities Limited is part of the Thames Water Plc group. VAT registration no GB 537-4569-15 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



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