ENGINEERING

Ms. S Ahmed
Lead Local Flood Authority
Post Point CHN 215
Hertfordshire County Council
County Hall, Pegs Lane
Hertford SG13 8DN

Our Ref: JTC/1943

16th October 2018

Dear Ms. S Ahmed,

Re: 18/01383/DOC – Legion House, Paynes Park, Hitchin, Hertfordshire, SG5 1EH

I write with reference to the above development following the response dated 4th July 2018 and would like to comment as follows;

I note the comment regarding your acknowledgment that the permeable paving will not be connected to the wider network, with the request for information regarding the ground conditions and supportive infiltration test results to ensure the feasibility of infiltration at a suitable rate. Please find attached the ground condition records for the development, including locations of the trial holes and logs of the underlying geology, with trial hole WS1 and WS2 located in the vicinity of the pedestrian access.

The trial holes indicate the site is underlain by slightly sandy, gravely, silty clay to a depth of between 1.9 and 2.5m below ground level respectively, then underlain by orange brown and slightly brown grained sand. Whilst the underlying sand geology is of suitable permeability, the overlying clay geology in which the permeable paved access will be located is of a low permeability and not considered suitable for infiltration as a means of surface water discharge.

As such discharge from the pedestrian access will be to the wider system discharging to the Anglian Water surface water system at the restricted rate of 9.1 litres per second during all events up to and including a 1 in 100 year plus 40% climate change event. In order to accommodate discharge from the proposed development including the 50m^2 pedestrian access, revised Micro Drainage calculation (attached) indicate that 2.2m^3 of attenuation is required. The proposed cellular attenuation system will therefore occupy an area of 8m^2 to a depth of 0.4m thus based upon a void space of 95% will provide 3m^3 of attenuation, as shown on the attached drainage layout.

The additional information provided above clearly demonstrated that the pedestrian access can be drained to the Anglian Water system even in the event that following a ground investigation infiltration system are not considered feasible.

Yours Sincerely,

Shavonne Cooper
For and on behalf of
MTC Engineering (Cambridge) Ltd

S I T E .PAYNES PARK, HITCHIN . . . . . .

RECORD OF T[redacted]BOREHOLE .WS1. . . . . .

Trial Pit Dimension:-.....m(long) x.....m(wide) x.....m(deep)
Rotary Drilled Hole:-.....mm dia to.....m depth
Core Size .....mm dia Cased:-.....mm dia to.....m depth
Flushing Medium:- Air/Water/Mud/Foam

HOLE SIZE 87.....mm to ..2.00..m depth
77.....mm to ..3.00..m depth
57.....mm to ..5.00..m depth

STARTED .11/09/18 . COMPLETED. . . . . DRILLER ..... GROUND LEVEL.....m.O.D.

L A B O R A T O R Y D E S C R I P T I O N S & T E S T I N G

Site Description of Strata	Depth m.	Sample or In-Situ Test Depth m. from	to	Type	Blows/ [redacted]	Water	Date	Disturbed & Bulk Sample Descr	Laboratory Test Results m %	LL/PL+BDen PI %	C Mg/m3	Ö kN/m2 deg	Laboratory Sample Descr	Change of Strata O.D. m.	Depth m.	Revised Description of Strata
MADE GROUND - Firm, brown, slightly sandy, gravelly, silty CLAY. Gravel of brick, concrete, flint, chalk, mortar and roots.		0.30		D1												
		0.50	0.80	B1												
		0.60		D2												
		0.90		D3												
	1.10															
		1.20	2.00	U1												
		1.20		D4												
MADE GROUND - Firm, orange brown and brown, slightly sandy, silty CLAY and occasional ash.		1.35	1.65	S	NB											
	1.80															
		2.00	3.00	U2												
		2.00		D5												
		2.15	2.45	S	NB											
Orange brown and light brown grained SAND.																
		3.00	4.00	U3												
		3.15	3.45	S	N15											
		4.00	5.00	U4												
		4.00		D6												
		4.15	4.45	S	N29											
	5.00															

S I T E .PAYNES PARK, HITCHIN . . . . . .

RECORD OF TRIAL PIT/BOREHOLE .WS2. . . . . .

Trial Pit Dimension:-.....m(long) x.....m(wide) x.....m(deep)
Rotary Drilled Hole:-.....mm dia to.....m depth
Core Size .....mm dia Cased:-.....mm dia to.....m depth
Flushing Medium:- Air/Water/Mud/Foam

HOLE SIZE 87.....mm to ..2.00..m depth
77.....mm to ..3.00..m depth
57.....mm to ..5.00..m depth

STARTED .11/09/18 . COMPLETED. . . . . .

L A B O R A T O R Y D E S C R I P T I O N S & T E S T I N G

D R I L L E R ..... GROUND LEVEL.....m.O.D.

Site Description of Strata	Depth m.	Sample or In-Situ Test Depth m. from	to	Type	Blows/ [illegible]	Water	Date	Disturbed & Bulk Sample Descr	Laboratory Test Results m %	LL/PL/PI %	BDen Mg/m3	C kN/m2	Ø deg	Laboratory Sample Descr	Change of Strata O.D. m.	Depth m.	Revised Description of Strata
MADE GROUND - Brown, slightly sandy, silty CLAY. Gravel of brick, concrete, bone, old roots and ash.		0.30		D1													
		0.50	0.80	B1													
		0.60		D2													
		0.90		D3													
		1.20	2.00	U1													
	1.40	1.20		D4													
Firm, orange brown, sandy, silty CLAY.		1.35	1.65	C	N7												
		2.00	3.00	U2													
		2.00		D5													
	2.50	2.15	2.45	C	N16												
Firm, orange brown and light brown SAND.																	
		3.00	4.00	U3													
		3.00		D6													
		3.15	3.45	C	N33												
		4.00	5.00	U4													
		4.00		D7													
		4.15	4.45	C	N31												
	5.00	5.00		D8													
		5.15	5.45	C	N31												

R E M A R K S

1.Starter pit excavated from 0.00m to 1.20m depth 2.Gas monitoring standpipe installed to 5.00m depth GROUNDWATER OBSERVATIONS:11/09/18 Depth observed 5.00m. Water Level dry.

BH WS2 14571

SITE .PAYNES PARK, HITCHIN . . . . . .

RECORD OF TRIAL PIT/BOREHOLE .WS3. . . . . .

Trial Pit Dimension:-.....m(long) x.....m(wide) x.....m(deep)
Rotary Drilled Hole:-.....mm dia to.....m depth
Core Size .....mm dia. Cased:-.....mm dia to.....m depth
Flushing Medium:- Air/Water/Mud/Foam

HOLE SIZE 87.....mm to ..2.00..m depth
77.....mm to ..3.00..m depth
57.....mm to ..5.45..m depth

STARTED .11/09/18 . COMPLETED. . . . . DRILLER ..... GROUND LEVEL.....m.O.D.

LABORATORY DESCRIPTIONS & TESTING

Site Description of Strata	Depth m.	Sample or In-Situ Test Depth m. from	to	Type	Blows/ [illegible]	Water	Date	Disturbed & Bulk Sample Descr	Laboratory Test Results m %	LL/PL %	PI %	BDen Mg/m3	C kN/m2	Ø deg	Laboratory Sample Descr	Change of Strata O.D. m.	Depth m.	Revised Description of Strata
MADE GROUND - Firm, brown, slightly sandy, gravelly, silty CLAY. Gravel of brick, concrete, ash and occasional bone fragments.		0.30		D1														
		0.50	0.80	B1														
		0.60		D2														
		0.90		D3														
		1.20	2.00	U1														
		1.20		D4														
[redacted]	1.60	1.35	1.65	S	N6													
Firm, brown, light brown, slightly sandy, gravelly CLAY. Gravel of angular to sub-rounded chalk and limestone.		-2.00-	-3.00-	U2														
		2.00		D5														
		2.15	2.45	S	N18													
[redacted]	2.90																	
Firm to stiff, orange brown, sandy, silty CLAY.		-3.00-	-4.00-	U3														
		3.00		D6														
		3.15	3.45	S	N13													
[redacted]	-4.00-	-4.00-	-5.00-	U4														
Firm, orange brown grey, silty CLAY with orange brown sand partings.		4.00		D7														
		4.15	4.45	S	N15													
		-5.00-		D8														
		5.15	5.45	S	N28													
[redacted]	5.45																	

REMARKS

1.Starter pit excavated from 0.00m to 1.20m depth

GROUNDWATER OBSERVATIONS:11/09/18 Depth observed 5.45m. Water Level dry.

Sheet 1 of 1

[redacted]/BH
WS3
14571

SITE .PAYNES PARK, HITCHIN . . . . . .

RECORD OF T[redacted]PIT/BOREHOLE .WS4. . . . . .

Trial Pit Dimension:-.....m(long) x.....m(wide) x.....m(deep)
Rotary Drilled Hole:-.....mm dia to.....m depth
Core Size .....mm dia Cased:-.....mm dia to.....m depth
Flushing Medium:- Air/Water/Mud/Foam

HOLE SIZE 87.....mm to ..2.00..m depth
77.....mm to ..3.00..m depth
57.....mm to ..5.45..m depth

STARTED .11/09/18 . COMPLETED. . . . . DRILLER ..... GROUND LEVEL.....m.O.D.

Site Description of Strata	Depth m.	Sample or In-Situ Test Depth m. from	to	Type	Blows/ [illegible]	Water	Date	Disturbed & Bulk Sample Descr	Laboratory Test Results m %	LL/PL	BDen Mg/m3	C kN/m2	Ø deg	Laboratory Sample Descr	Change of Strata O.D. m.	Depth m.	Revised Description of Strata
MADE GROUND - Firm, brown, dark brown, slightly sandy, gravelly, silty CLAY. Gravel of brick, concrete, mortar, clinker and ash.		0.20		D1													
		0.50		D2													
		0.50	0.80	B1													
		0.80		D3													
	1.00																
		1.20	2.00	U1													
		1.20		D4													
MADE GROUND - Firm, brown, sandy, gravelly CLAY. Gravel of flint, brick and ash.	1.70	1.35	1.65	S	N10												
	2.00	2.00	3.00	U2													
		2.00		D5													
Orange brown, silty SAND.		2.15	2.45	S	N5												
Grey brown, orange brown fine to medium grained SAND.	3.00		4.00	U3													
		3.00		D6													
		3.15	3.45	S	N15												
	4.00		5.00	U4													
		4.00		D7													
		4.15	4.45	S	N21												
	5.00			D8													
		5.15	5.45	S	N26												
	5.45																

REMARKS

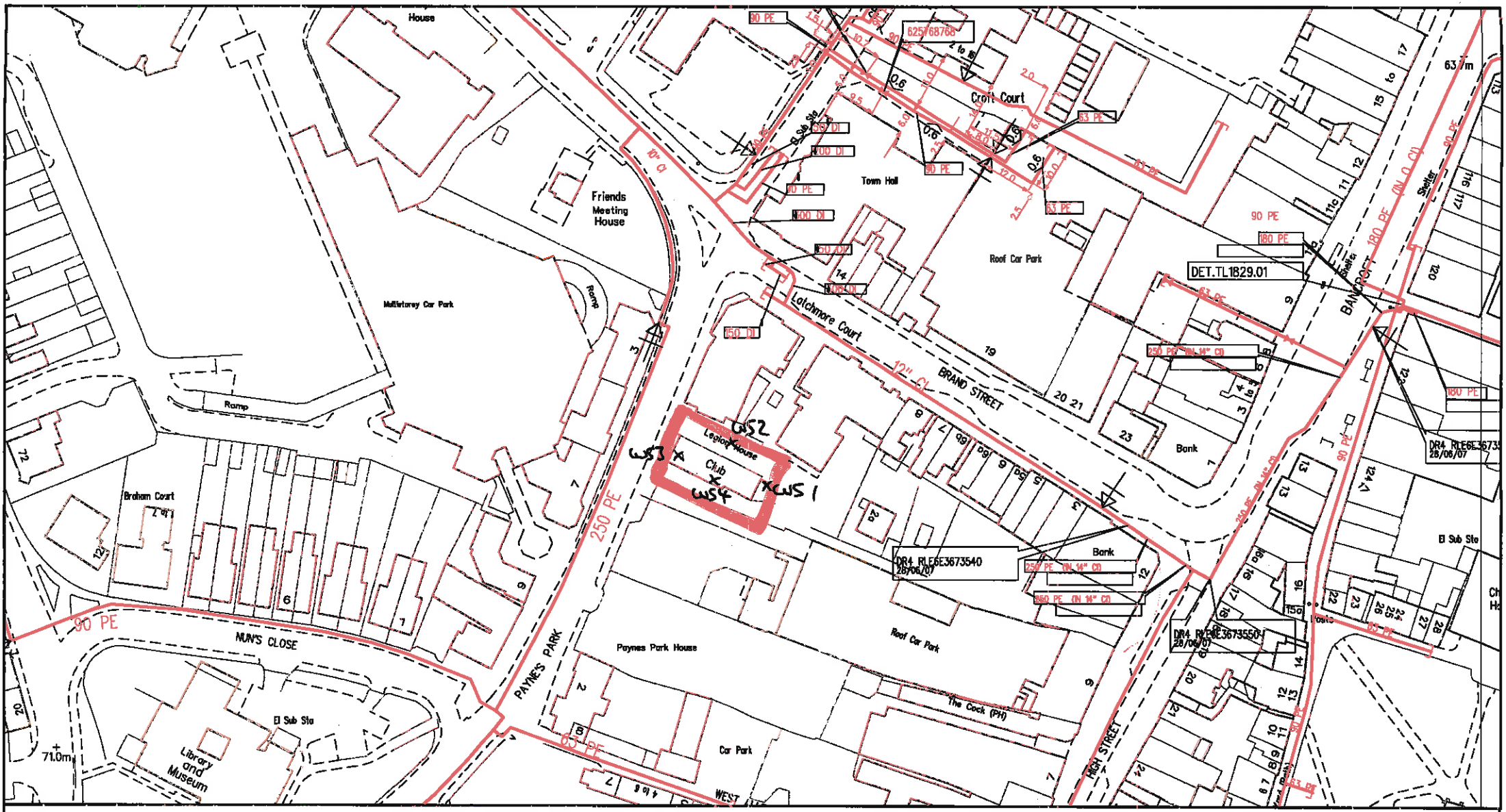
1.Starter pit excavated from 0.00m to 1.20m depth

GROUNDWATER OBSERVATIONS:11/09/18 Depth observed 5.00m. Water Level dry.

Sheet 1 of 1

TP/BH

WS4 | 14571



SCALE: 1 : 1250	LP MAINS
USER ID: alison	MP MAINS
DATE: 04/09/2018	IP MAINS
EXTRACT DATE: 13/06/2018	LHP MAINS
MAP REF: TL1829	
CENTRE: 518325, 229229	

Some examples of Plant Items:

Valve | Depth of Cover | Syphon | Diameter Change | Material Change | Out of Standard Service

This plan shows those pipes owned by Cadent Gas Ltd in their role as a Licensed Gas Transporter (GT). Gas pipes owned by other GTs, or otherwise privately owned, may be present in this area. Information with regard to such pipes should be obtained from the relevant owners. The information shown on this plan is given without warranty, the accuracy thereof cannot be guaranteed. Service pipes, valves, syphons, stub connections, etc. are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Cadent Gas Ltd or their agents, servants or contractors for any error or omission. Safe digging practices, in accordance with HS(G)47, must be used to verify and establish the actual position of mains, pipes, services and other apparatus on site before any mechanical plant is used. It is your responsibility to ensure that this information is provided to all persons (either direct labour or contractors) working for you on or near gas apparatus. The information included on this plan should not be referred to beyond a period of 28 days from the date of issue. Further information on all DR4s can be determined by calling the DR4 hotline on 01455 892426 (9am-5pm) A DR4 is where a potential error has been identified within the asset record and a process is currently underway to investigate and resolve the error as appropriate.

MAPS Viewer Version 5.8.0.1

Local Machine

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

Half Drain Time : 3 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	68.274	0.334	0.0	9.1	9.1	2.5	O K
30 min Summer	68.225	0.285	0.0	9.1	9.1	2.2	O K
60 min Summer	68.106	0.166	0.0	9.0	9.0	1.3	O K
120 min Summer	68.053	0.113	0.0	6.4	6.4	0.9	O K
180 min Summer	68.034	0.094	0.0	4.8	4.8	0.7	O K
240 min Summer	68.023	0.083	0.0	3.9	3.9	0.6	O K
360 min Summer	68.009	0.069	0.0	2.8	2.8	0.5	O K
480 min Summer	68.001	0.061	0.0	2.3	2.3	0.5	O K
600 min Summer	67.995	0.055	0.0	1.9	1.9	0.4	O K
720 min Summer	67.991	0.051	0.0	1.6	1.6	0.4	O K
960 min Summer	67.985	0.045	0.0	1.3	1.3	0.3	O K
1440 min Summer	67.978	0.038	0.0	0.9	0.9	0.3	O K
2160 min Summer	67.972	0.032	0.0	0.7	0.7	0.2	O K
2880 min Summer	67.968	0.028	0.0	0.5	0.5	0.2	O K
4320 min Summer	67.964	0.024	0.0	0.4	0.4	0.2	O K
5760 min Summer	67.961	0.021	0.0	0.3	0.3	0.2	O K
7200 min Summer	67.959	0.019	0.0	0.2	0.2	0.1	O K
8640 min Summer	67.958	0.018	0.0	0.2	0.2	0.1	O K
10080 min Summer	67.956	0.016	0.0	0.2	0.2	0.1	O K
15 min Winter	68.309	0.369	0.0	9.1	9.1	2.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	143.506	0.0	6.7	12
30 min Summer	92.482	0.0	8.7	20
60 min Summer	56.713	0.0	10.6	34
120 min Summer	33.633	0.0	12.6	64
180 min Summer	24.479	0.0	13.8	94
240 min Summer	19.441	0.0	14.6	124
360 min Summer	13.973	0.0	15.7	184
480 min Summer	11.062	0.0	16.6	244
600 min Summer	9.223	0.0	17.3	302
720 min Summer	7.947	0.0	17.9	362
960 min Summer	6.278	0.0	18.8	488
1440 min Summer	4.498	0.0	20.2	732
2160 min Summer	3.218	0.0	21.7	1092
2880 min Summer	2.536	0.0	22.8	1468
4320 min Summer	1.811	0.0	24.4	2180
5760 min Summer	1.424	0.0	25.6	2896
7200 min Summer	1.182	0.0	26.6	3672
8640 min Summer	1.015	0.0	27.4	4368
10080 min Summer	0.892	0.0	28.1	5136
15 min Winter	143.506	0.0	7.5	13

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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 Σ Outflow (l/s)	Max Volume (m³)	Status
30 min Winter	68.203	0.263	0.0	9.1	9.1	2.0	O K
60 min Winter	68.075	0.135	0.0	8.0	8.0	1.0	O K
120 min Winter	68.035	0.095	0.0	4.9	4.9	0.7	O K
180 min Winter	68.019	0.079	0.0	3.6	3.6	0.6	O K
240 min Winter	68.009	0.069	0.0	2.9	2.9	0.5	O K
360 min Winter	67.998	0.058	0.0	2.1	2.1	0.4	O K
480 min Winter	67.991	0.051	0.0	1.6	1.6	0.4	O K
600 min Winter	67.986	0.046	0.0	1.4	1.4	0.4	O K
720 min Winter	67.983	0.043	0.0	1.2	1.2	0.3	O K
960 min Winter	67.978	0.038	0.0	0.9	0.9	0.3	O K
1440 min Winter	67.972	0.032	0.0	0.7	0.7	0.2	O K
2160 min Winter	67.967	0.027	0.0	0.5	0.5	0.2	O K
2880 min Winter	67.964	0.024	0.0	0.4	0.4	0.2	O K
4320 min Winter	67.960	0.020	0.0	0.3	0.3	0.2	O K
5760 min Winter	67.958	0.018	0.0	0.2	0.2	0.1	O K
7200 min Winter	67.956	0.016	0.0	0.2	0.2	0.1	O K
8640 min Winter	67.955	0.015	0.0	0.2	0.2	0.1	O K
10080 min Winter	67.954	0.014	0.0	0.1	0.1	0.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
30 min Winter	92.482	0.0	9.7	21
60 min Winter	56.713	0.0	11.9	34
120 min Winter	33.633	0.0	14.1	64
180 min Winter	24.479	0.0	15.4	94
240 min Winter	19.441	0.0	16.3	124
360 min Winter	13.973	0.0	17.6	186
480 min Winter	11.062	0.0	18.6	246
600 min Winter	9.223	0.0	19.4	304
720 min Winter	7.947	0.0	20.0	374
960 min Winter	6.278	0.0	21.1	478
1440 min Winter	4.498	0.0	22.7	724
2160 min Winter	3.218	0.0	24.3	1068
2880 min Winter	2.536	0.0	25.6	1420
4320 min Winter	1.811	0.0	27.4	2200
5760 min Winter	1.424	0.0	28.7	2976
7200 min Winter	1.182	0.0	29.8	3672
8640 min Winter	1.015	0.0	30.7	4344
10080 min Winter	0.892	0.0	31.5	5096

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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)	20.000	Shortest Storm (mins)	15
Ratio R	0.446	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.025

Time (mins) From:	To:	Area (ha)
0	4	0.025

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Model Details

Storage is Online Cover Level (m) 69.200

Cellular Storage Structure

Invert Level (m) 67.940 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	8.0	8.0	1.300	8.0	22.7
0.100	8.0	9.1	1.400	8.0	23.8
0.200	8.0	10.3	1.500	8.0	25.0
0.300	8.0	11.4	1.600	8.0	26.1
0.400	8.0	12.5	1.700	8.0	27.2
0.500	8.0	13.7	1.800	8.0	28.4
0.600	8.0	14.8	1.900	8.0	29.5
0.700	8.0	15.9	2.000	8.0	30.6
0.800	8.0	17.1	2.100	8.0	31.8
0.900	8.0	18.2	2.200	8.0	32.9
1.000	8.0	19.3	2.300	8.0	34.0
1.100	8.0	20.4	2.400	8.0	35.2
1.200	8.0	21.6	2.500	8.0	36.3

Hydro-Brake Optimum® Outflow Control

Unit Reference	MD-SHE-0147-9100-0420-9100
Design Head (m)	0.420
Design Flow (l/s)	9.1
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Diameter (mm)	147
Invert Level (m)	67.940
Minimum Outlet Pipe Diameter (mm)	225
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.420	9.1
Flush-Flo™	0.211	9.1
Kick-Flo®	0.345	8.3
Mean Flow over Head Range	-	7.0

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	5.3	0.300	8.8	0.500	9.9	0.800	12.3
0.200	9.1	0.400	8.9	0.600	10.8	1.000	13.7

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Hydro-Brake Optimum® Outflow Control

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
1.200	14.9	2.400	20.8	5.000	29.5	8.000	37.4
1.400	16.1	2.600	21.6	5.500	31.0	8.500	38.6
1.600	17.1	3.000	23.2	6.000	32.3	9.000	39.7
1.800	18.1	3.500	24.9	6.500	33.7	9.500	40.8
2.000	19.1	4.000	26.6	7.000	35.0		
2.200	19.9	4.500	28.0	7.500	36.2		

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Construct new inspection chamber on existing drain

Construct new inspection chamber on existing drain

New rwp to discharge to existing foul drain as existing

FIC1
CL70.4
IL 68.95

FIC2
CL70.35
IL 69.01

FIC3
CL70.35
IL 69.146

FIC4
CL70.2
IL 69.318

FIC5
CL69.75
IL 69.45

SIC2
CL69.2
IL 68.36

SIC 4 (Silt Trap)
CL69.20
IL 68.10

SIC 3
CL69.20
IL 67.94

100mm @ 1/60

100Ø 1/40

100Ø 1/60

150Ø 1/100

Aco M100D 0.0 MultiDrain
(D400 Cover) Cover = 69.15m
Sump 100Ø Outlet = 68.515m

AquaCell Cellular Storage
Area = 2.0m x 4.0m x 0.4m
Invert = 68.10

Aco M100D 0.0 MultiDrain
(D400 Cover) Cover = 69.125m
Sump 150Ø Outlet = 68.145m

Aco M100D 0.0 MultiDrain
(D400 Cover) Cover = 68.56m
Sump 150Ø Outlet = 67.85m

Construct new drainage channel over exsting gully and utilise existing outfall connection

Hydro-brake Flow Control
Design Flow = 9.1 L/Sec
Head = 0.420m

new 2.0m high mesh fence and climbing plants

Larchmore Court Block A

Larchmore Court Block B

communal courtyard

+69.2

Private Drainage Key

- Foul Inspection Chamber (Depth <0.6m [1 side connection])
- Foul Inspection Chamber (Depth <1.2m [2 side connections])
- Foul BR manhole PCC Ring (1.2-1.5m)
- Foul BR manhole PCC Ring (1.50-2.7m)
- Storm Inspection Chamber (Depth <0.6m [1 side connection])
- Storm Inspection Chamber (Depth <1.2m [2 side connections])
- Storm BR manhole PCC Ring (1.2-1.5m)
- Storm BR manhole PCC Ring (1.50-2.7m)
- Backdrop on SW Chamber
- Backdrop on FW Chamber
- RE / RE — Rodding eye with Invert Level
- DDC — Dished drainage channel with gully.
- ACO — ACO channel or similar with gully and rodding point.
- Gully
- Road Gully
- FFL 12.50 — FFL Level

Adoptable Sewer Key

- 150gd83 — F1(1.80) — Foul sewer with pipe dia. & gradient incl. adoptable FWMH with reference & Invert.
- 225gd150 — S1(2.25) — Storm sewer with pipe dia. & gradient incl. adoptable SWMH with reference & Invert.

Surface Water Attenuation

Wavin "Aquacell" Storm Water Management System
Cellular storage tanks suitable for vehicular loading (where applicable) with 95% voids wrapped in a permeable geo-membrane

North Arrow

N W E S

NOTES

1. The contractor shall check all tie-ins for line and level with existing before commencing any works. The Engineer shall be notified immediately, in writing, should any errors be found.
2. Any discrepancies, of whatever nature, must be reported to the Engineer prior to the commencement or continuance of any further works.
3. All private drainage works to be in accordance with the requirements of Building Regulations 2010, Part H, "Drainage and waste disposal", (01st October 2015).
4. All pipes to be bedded and backfilled in accordance with Part H, Diagram 10. Shallow pipes shall be protected in accordance with Part H, Diagram 11.
5. Unless otherwise stated, all private drainage to be 100mm diameter. Gradients have been shown where there are pipe capacity issues and these should be regarded as minimums. Unless there are constraints dictating otherwise, gradients shall generally be 1 in 60. 100mm diameter pipes shall not be laid flatter than 1 in 80, 150mm diameter pipes shall not be laid flatter than 1 in 150.
6. All pipes, chambers and fittings to be installed strictly in accordance with the manufacturers instructions.
7. Pipes which run adjacent to buildings shall be installed in strict accordance with Part H, Clauses 2.23 to 2.25 and Diagram 8.
8. All private manholes, inspection chambers and drainage channels to comply with BS EN124. Cover strengths to be:
   Class D400 in heavy trafficked areas (access roads, service yards etc.)
   Class C250 in lightly trafficked areas (car parks, driveways etc)
   Class B125 in Non trafficked areas
   Class A15 in landscaping areas
9. All drains in the vicinity of existing or proposed trees to be constructed in accordance with the requirements of NHBC Practice Note 3.
10. Private drainage frames must be tied to manhole risers by use of manufacturers ties (e.g. Polypipe ref. FBK500 fixing kit and FBK501 black ties.) The ground works contractor will be held fully responsible for any accidents due to incorrect fitting or failure to use the correct manufacturers fixing equipment.
11. All existing land drains encountered on site during construction to be re-connected.
12. Should any departure from the slab level be considered, agreement shall be sought from the Engineer immediately and prior to commencement or continuance of any works, and should take full account of all restrictions to the slab level.
13. Garage slabs relate to the finished level of the concrete at the front entrance of the garage.
14. Where a drive slopes towards a garage there is to be a 75mm ramp up to the garage slab.
15. Maximum gradients of gardens to be 1 in 6 (unless stated otherwise), except for designed banking works.
16. All dimensions in metres unless otherwise stated.
17. As underlying ground conditions may be variable across the site the Contractor shall undertake onsite porosity tests at the location and depth of each soakaway. Tests should be undertaken in accordance with BRE365 and results forwarded to the Engineers to allow verification of designs.
18. All existing services, sewers and drains indicated on this drawing and any other related drawings are shown only indicatively, and shall have their positions and level confirmed on site by the Contractor.
19. The invert levels of all existing sewers, drains, ditches, tanks or other features and apparatus where a new connection is to be made shall have their precise position and level confirmed on site by the Contractor prior to commencement of any construction work. The results of the investigations shall be confirmed to MTC Engineering (Cambridge) Ltd so that the design can be verified.

NOTE:
At the location of the proposed lateral connection the contractor shall establish the position and depth of any existing services to prevent any clash in level and abortive costs.

Anglian Water Notes

All S.104 adoptable drainage shall conform to the design and construction guide for developers, Sewers for Adoption 6th Edition published by WRc plc and any AWSL additions & deletions current at the time of execution.

All covers and frames on adoptable AW sewers are to be D400, kitemarked and be badged 'FW' or 'SW' accordingly. Suppliers shall be Stanton, Paul Savage, Norinco or Wrekin.

Adoptable pipework shall be to the following specification:

Clayware: BS EN 295-1:1991
150 dia. Crushing Strength 34kN/m
225 dia. Class 160

Concrete: BS EN 5911-1:2002
>300 dia. Class 120

REV	DATE	DESCRIPTION/REASON FOR ISSUE	APPR
B	16.10.18	UPDATED DRAINAGE	SEC
B	06.04.18	TOPO SURVEY ADDED + DRAINAGE REVISED	JTC

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TITLE

PAYNES PARK, HITCHIN
HERTFORDSHIRE
PROPOSED DRAINAGE LAYOUT

ORIG: S.E.C	DATE: 22.06.17
CHKD:	SCALE: 1:100@A1
APPR:	DRAWING NO: 1943-03 REV B

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