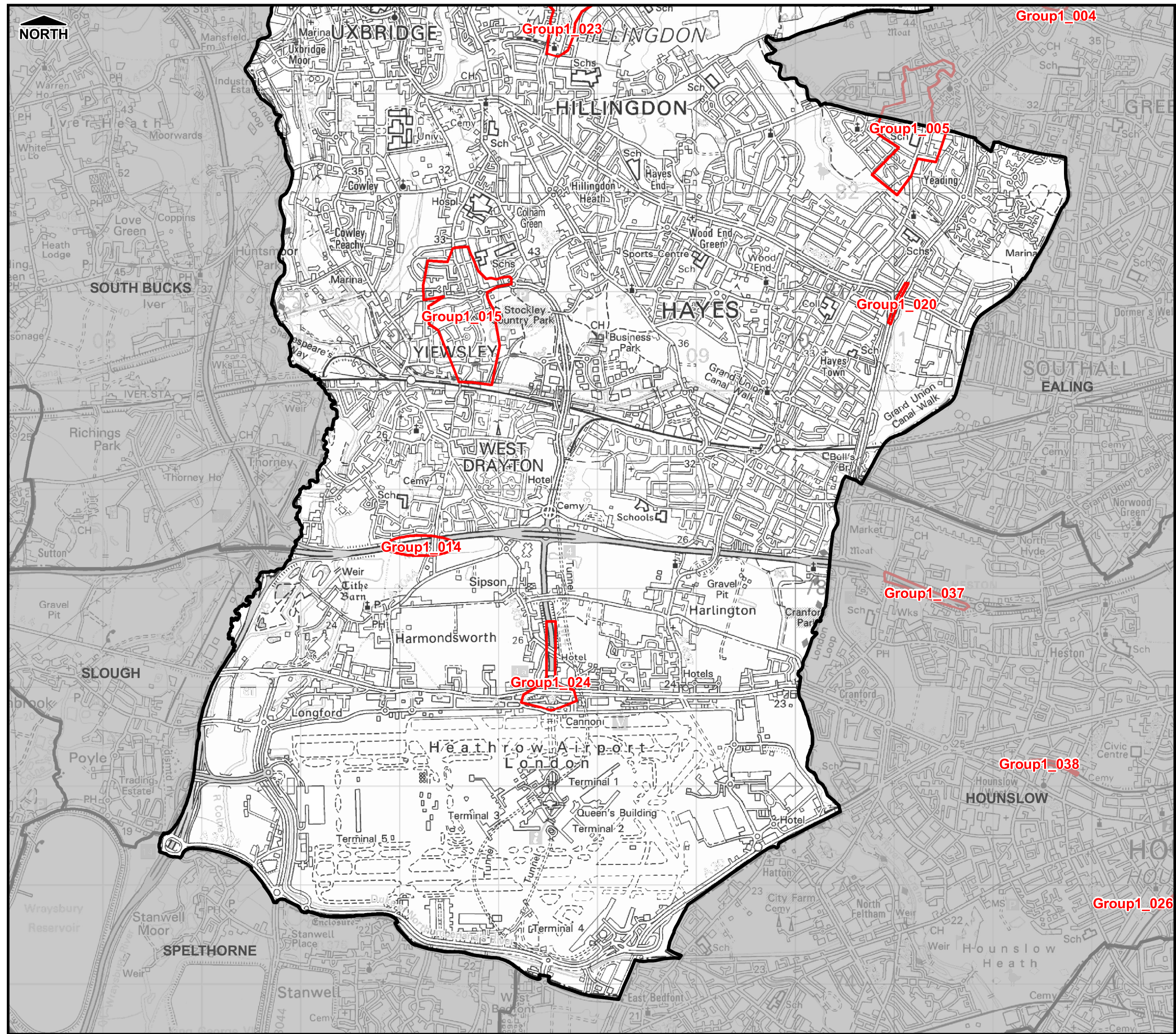


Filepath: L:\Environment\zwet\CS046913_DrainLondon_Tier2\Group1\ARC\mxd\GP1_Hillingdon_Fig1.2_CDA_Index.mxd



THIS DRAWING MAY BE USED ONLY FOR
THE PURPOSE INTENDED

Legend

- Borough Administrative Boundary
- Critical Drainage Area

Notes

**London Borough of
Hillingdon**



Surface Water Management Plan

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Scale at A3	Date	Drawn by	Approved by
1:40,000	15/04/2011	R.MOORE	P.HLINOVSKY

Critical Drainage Area Index Map

Consultants	Capita Symonds Level Seven, 52 Grosvenor Gardens, Belgravia, London SW1W 0AU
CAPITA SYMONDS	
Flood Risk Management	

Drain London Programme Board Members



FIGURE 1.2

Appendix F

Thames Water Asset Plan



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
9003	30.98	29.52
9002	31.05	29.38
9102	30.8	28.25
9103	30.77	29.18
80XE	n/a	n/a
80LR	n/a	n/a
80XB	n/a	n/a
80LQ	n/a	n/a
80LE	n/a	n/a
80A1	n/a	n/a
8007	31.87	29.11
80LP	n/a	n/a
80LN	n/a	n/a
80LM	n/a	n/a
80LS	n/a	n/a
90LN	n/a	n/a
90LM	n/a	n/a
9001	31.48	29.57
90LA	n/a	n/a
9004	31.17	30.03
8008	30.9	30.3
8001	31	29.4
811D	n/a	n/a
8107	30.98	30.46
8105	31.03	30.56
8102	31.02	29.75
8108	30.94	29.62
8104	30.96	29.64
8103	30.96	29.81
80HH	n/a	n/a
8122	n/a	n/a
80HJ	n/a	n/a
811B	n/a	n/a
801LD	n/a	n/a
81LA	n/a	n/a
811C	n/a	n/a
811A	n/a	n/a
8106	31.06	29.08
8024	31.9	30.9
80LF	n/a	n/a
8109	31.97	30.78
80LG	n/a	n/a
801A	n/a	n/a
801B	n/a	n/a
8121	30.9	29.6
911A	n/a	n/a
9101	30.91	28.74
80XK	n/a	n/a
8029	32.23	30.03
8004	31.35	29.14
80LB	n/a	n/a
80LC	n/a	n/a
8006	32.05	28.97
80LA	n/a	n/a
8013	32.87	31.22
80XL	n/a	n/a
8005	32.62	30.32
8026	32.1	29.92
7127	31.19	29.85
7106	31.24	29.61
7116	31.52	30.69
7122	31	28.8
7120	31.16	30.78
7107	31.17	29.69
7006	31.67	29.39
7113	31.19	30.34
7125	31.12	29.95
7123	31.07	30.32
7026	32.14	28.68
7027	32.14	30.19
7007	30.97	29.81
7010	31.25	30.19
7109	31.09	30.14
7025	30.94	30.31
7028	32.16	30.18
7115	30.98	30.27
7008	30.97	30.19
7114	31.08	30.35
7108	31.03	30.27
7121	31.05	30.34
7009	31	29.07
8028	30.94	30.13
8002	31.01	29.2
8009	30.93	30.25
8101	31.02	30
79FK	n/a	n/a
70ZI	n/a	n/a
7035	n/a	n/a
60ZB	n/a	n/a
70ZB	n/a	n/a
70ZC	n/a	n/a

Manhole Reference	Manhole Cover Level	Manhole Invert Level
70ZD	n/a	n/a
70ZA	n/a	n/a
7033	31.72	29.22
70ZH	n/a	n/a
60ZF	n/a	n/a
60ZA	n/a	n/a
702G	n/a	n/a
702F	n/a	n/a
70XI	n/a	n/a
70XJ	n/a	n/a
86ZG	n/a	n/a
70XH	n/a	n/a
70XK	n/a	n/a
7023	32.06	30.39
70XL	n/a	n/a
7022	32.06	28.95
70XA	n/a	n/a
70XG	n/a	n/a
70XF	n/a	n/a
7021	32.42	29.07
70XM	n/a	n/a
7102	31.68	30.71
6107	31.57	29.68
7133	31.65	30.35
711D	n/a	n/a
711A	n/a	n/a
7131	31.73	30.68
7101	31.73	29.98
7111	31.13	30.13
711B	n/a	n/a
711C	n/a	n/a
611A	n/a	n/a
7130	31.21	29.92
611B	n/a	n/a
611C	n/a	n/a
7205	31.25	29.64
721A	n/a	n/a
7201	31.44	30.34
7207	31.06	30.01
621E	n/a	n/a
7204	31.34	29.78
621F	n/a	n/a
7206	31.27	30.09
6203	31.64	30.62
621J	n/a	n/a
621I	n/a	n/a
7202	31.49	30.19
7203	31.47	30.15
7209	n/a	n/a
621A	n/a	n/a
6204	31.95	30.88
721B	n/a	n/a
8204	31.49	30.1
8202	31.49	30.51
8301	31.66	30.7
8302	31.69	30.39
6305	36.65	34.99
7403	n/a	n/a
7405	n/a	n/a
7402	n/a	n/a
7406	n/a	n/a
7407	n/a	n/a
7404	34.74	33.42
6403	31.73	30.93
6405	31.61	30.63
7401	n/a	n/a
70XE	n/a	n/a
70XD	n/a	n/a
7024	32.05	28.95
7034	32.12	30.06
70XC	n/a	n/a
70XB	n/a	n/a
60XA	n/a	n/a
60XF	n/a	n/a
7002	31.55	31.1
7005	30.95	30.09
7104	31.47	27.72
7135	32.24	30.39
61XK	n/a	n/a
61XH	n/a	n/a
7112	n/a	n/a
6121	32.19	30.45
6102	31.9	30.63
7132	31.75	31
6103	32.32	28.77
7129	31.28	30.73
61LF	n/a	n/a
7105	31.52	30.21
7126	31.43	30.6
6105	31.55	30.45
7103	31.59	30.62
7134	31.61	30.56
6104	31.61	29.34

Manhole Reference	Manhole Cover Level	Manhole Invert Level
6005	31.95	29.35
60FA	n/a	n/a
60XD	n/a	n/a
60FF	n/a	n/a
60XX	n/a	n/a
60FG	n/a	n/a
60XB	n/a	n/a
60FE	n/a	n/a
60FK	n/a	n/a
60XC	n/a	n/a
60FJ	n/a	n/a
6002	32.16	28.76
60FI	n/a	n/a
60XG	n/a	n/a
6006	n/a	n/a
60FH	n/a	n/a
6001	31.87	30.01
60XZ	n/a	n/a
61XW	n/a	n/a
61XG	n/a	n/a
51XC	n/a	n/a
61XY	n/a	n/a
6122	32.13	30.33
61XX	n/a	n/a
51XD	n/a	n/a
511O	n/a	n/a
6101	31.95	28.16
611R	n/a	n/a
6108	32.06	30.64
511D	n/a	n/a
5104	31.94	30.81
52A1	n/a	n/a
5102	31.98	27.88
5202	32.12	30.02
51LC	n/a	n/a
521A	n/a	n/a
5201	32.25	27.79
51LA	n/a	n/a
5307	32.28	31.19
51LB	n/a	n/a
5304	32.71	30.74
5106	31.9	30.62
5105	32.06	30.73
5123	32.38	31.05
611G	n/a	n/a
61JD	n/a	n/a
6304	33.19	32.12
61LA	n/a	n/a
62LA	n/a	n/a
61LB	n/a	n/a
61LD	n/a	n/a
61LC	n/a	n/a
62LC	n/a	n/a
62LB	31.82	31.17
6202	31.82	31.02
621B	n/a	n/a
50XJ	n/a	n/a
50KE	n/a	n/a
50XD	n/a	n/a
50XH	n/a	n/a
5002	31.35	29.38
5004	n/a	n/a
50XG	n/a	n/a
5005	n/a	n/a
50XE	n/a	n/a
5001	31.62	30.03
50XA	n/a	n/a
501F	n/a	n/a
5109	31.78	30.65
5108	31.95	30.57
511F	n/a	n/a
6302	33.13	31.08
5303	33.01	27.87
5302	32.43	30.2
6303	34.72	32.63
5306	32.5	30.28
5301	31.32	29.43
5305	31.42	30.11
6301	31.28	27.95
6402	31.72	28.09
6401	31.66	28.26
6404	31.68	30.48
5402	31.68	30.18
5401	31.7	30
5003	n/a	n/a
511N	n/a	n/a
51XA	n/a	n/a
5203	31.97	30.77
5101	31.88	27.54
5107	31.77	30.17
51XB	n/a	n/a
511E	n/a	n/a
6007	n/a	n/a

Manhole Reference	Manhole Cover Level	Manhole Invert Level
60XK	n/a	n/a
60XJ	n/a	n/a
60XN	n/a	n/a
60XE	n/a	n/a
60XS	n/a	n/a
50XC	n/a	n/a
50XB	n/a	n/a
60XY	n/a	n/a
60XH	n/a	n/a
50KA	n/a	n/a
60XI	n/a	n/a
60FC	n/a	n/a
6003	31.84	30.54
60FB	n/a	n/a

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.



ALS Sewer Map Key

Public Sewer Types (Operated & Maintained by Thames Water)

Foul: A sewer designed to convey waste water from domestic and industrial sources to a treatment works.

Surface Water: A sewer designed to convey surface water (e.g. rain water from roofs, yards and car parks) to rivers or watercourses.

Combined: A sewer designed to convey both waste water and surface water from domestic and industrial sources to a treatment works.

Trunk Surface Water

Trunk Foul

Storm Relief

Trunk Combined

Vent Pipe

Bio-solids (Sludge)

Proposed Thames Surface Water Sewer

Proposed Thames Water Foul Sewer

Gallery

Foul Rising Main

Surface Water Rising Main

Combined Rising Main

Sludge Rising Main

Proposed Thames Water Rising Main

Vacuum

Sewer Fittings

A feature in a sewer that does not affect the flow in the pipe. Example: a vent is a fitting as the function of a vent is to release excess gas.

- Air Valve
- Dam Chase
- Fitting
- Meter
- Vent Column

Operational Controls

A feature in a sewer that changes or diverts the flow in the sewer. Example: A hydrobrake limits the flow passing downstream.

- Control Valve
- Drop Pipe
- Ancillary
- Weir

End Items

End symbols appear at the start or end of a sewer pipe. Examples: an Undefined End at the start of a sewer indicates that Thames Water has no knowledge of the position of the sewer upstream of that symbol, Outfall on a surface water sewer indicates that the pipe discharges into a stream or river.

- Outfall
- Undefined End
- Inlet

Notes:

- 1) All levels associated with the plans are to Ordnance Datum Newlyn.
- 2) All measurements on the plans are metric.
- 3) Arrows (on gravity fed sewers) or flecks (on rising mains) indicate direction of flow.
- 4) Most private pipes are not shown on our plans, as in the past, this information has not been recorded.
- 5) 'na' or '0' on a manhole level indicates that data is unavailable.

6) The text appearing alongside a sewer line indicates the internal diameter of the pipe in millimetres. Text next to a manhole indicates the manhole reference number and should not be taken as a measurement. If you are unsure about any text or symbology present on the plan, please contact a member of Property Insight on 0845 070 9148.

Other Symbols

Symbols used on maps which do not fall under other general categories

- Public/Private Pumping Station
- Change of characteristic indicator (C.O.C.I.)
- Invert Level
- Summit

Areas

Lines denoting areas of underground surveys, etc.

- Agreement
- Operational Site
- Chamber
- Tunnel
- Conduit Bridge

Other Sewer Types (Not Operated or Maintained by Thames Water)

- Foul Sewer

Surface Water Sewer
- Combined Sewer

Gully
- Culverted Watercourse

Proposed
- Abandoned Sewer

Appendix G

Proposed Surface Water Strategy

Catchments to Tank

Blue Roof
Sized = 320m² x 129mm
Discharge = 0.5 l/s

Other Areas
Unrestricted roofs = 740m²
Paving area = 340m²
Permeable area = 341m²
Total = 1421m²

Permeable Paving
Area = 341m²
Storage = 20m³
(Including 30% sub-base void ration @ 0.195m deep)

Blue Roof: 320m²
Catchment: 388m²

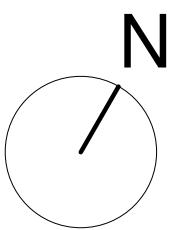
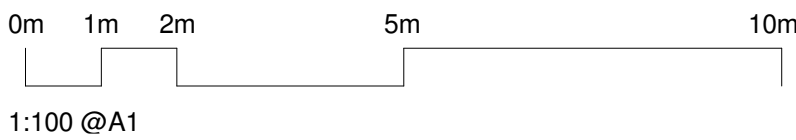
Roof Area: 230m²

Roof Area: 250m²

Roof Area: 260m²

Paving Area = 340m²

1 Ground Floor Plan
1 : 100



Catchments to Tank

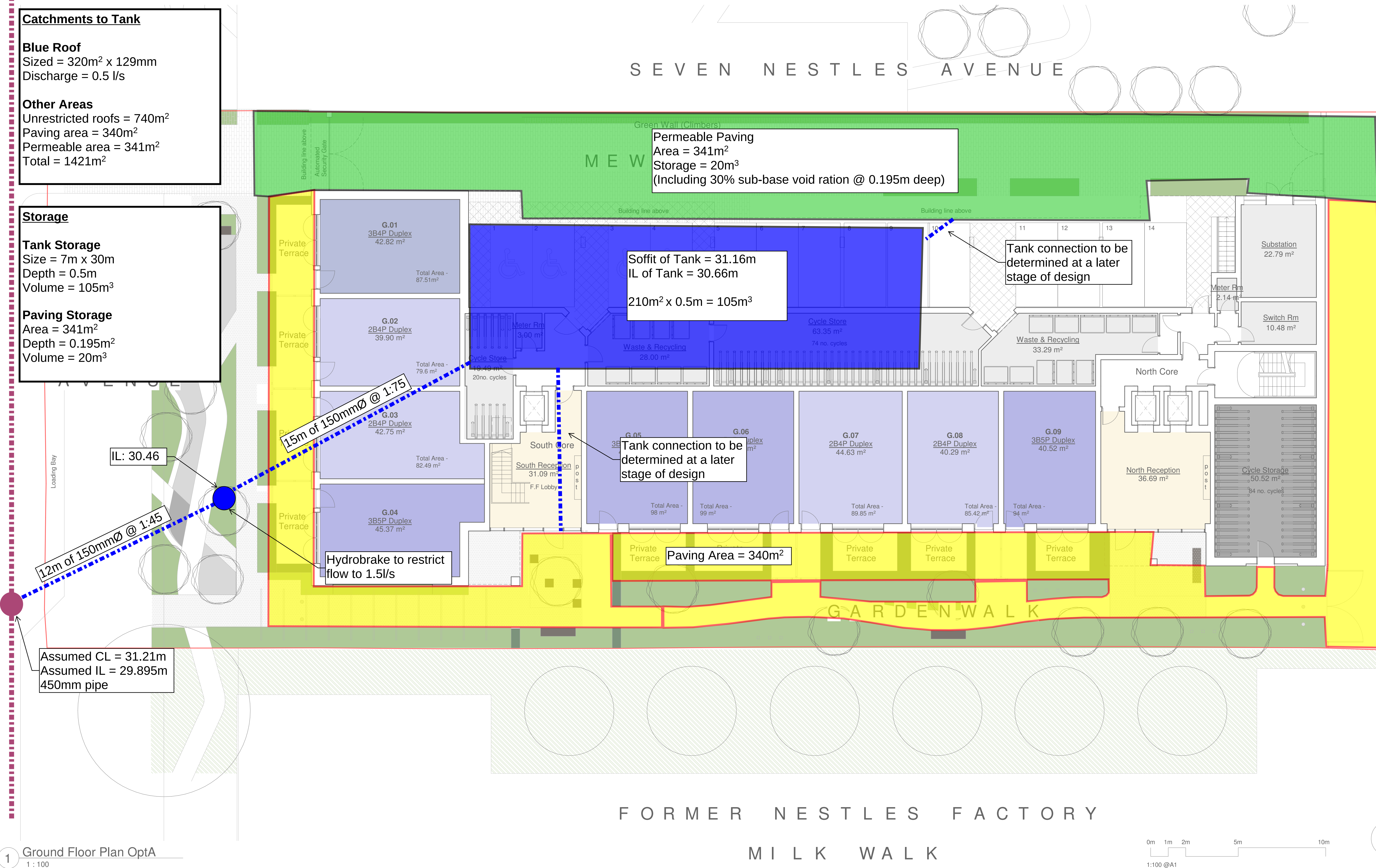
Blue Roof
Sized = 320m² x 129mm
Discharge = 0.5 l/s

Other Areas
Unrestricted roofs = 740m²
Paving area = 340m²
Permeable area = 341m²
Total = 1421m²

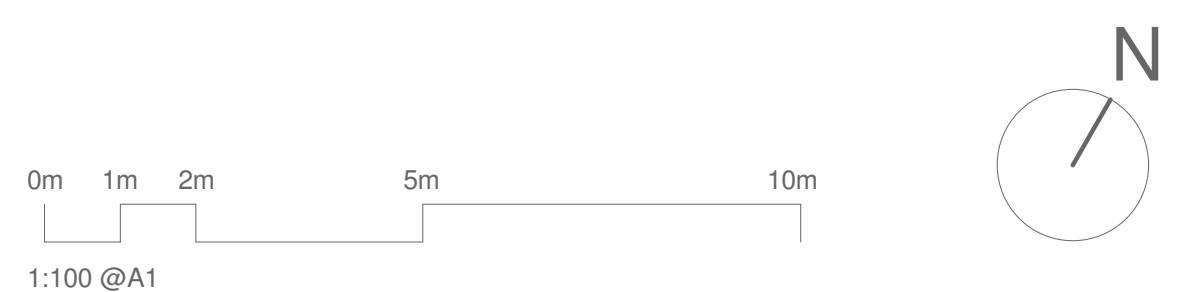
Storage

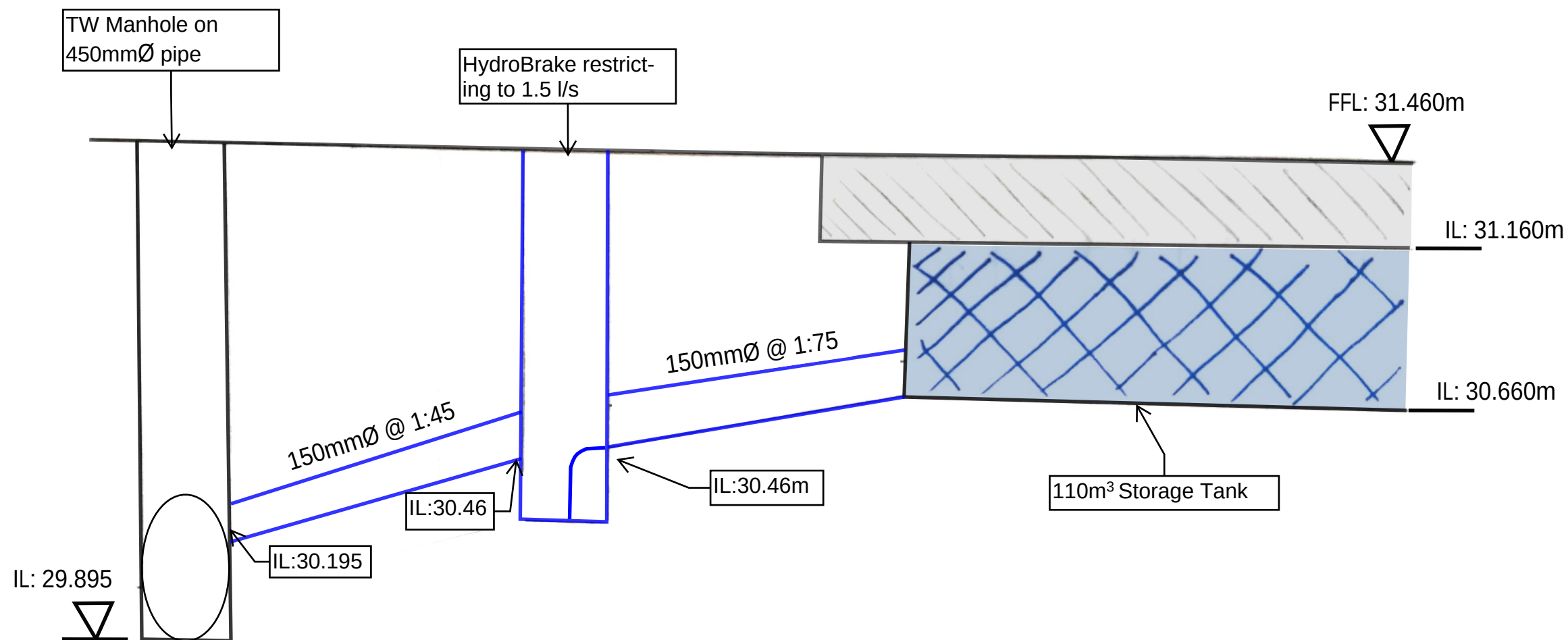
Tank Storage
Size = 7m x 30m
Depth = 0.5m
Volume = 105m³

Paving Storage
Area = 341m²
Depth = 0.195m²
Volume = 20m³



1 Ground Floor Plan OptA
1 : 100





Appendix H

Surface Water Calculations

Heyne Tillett Steel						Page 1																																																																																																																																																																																																																																																																																		
4 Pear Tree Court London EC1R 0DS			2006 - 9 Nestles Avenue Proposed Surface Water Drainage Network																																																																																																																																																																																																																																																																																					
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<u>Summary of Results for 100 year Return Period (+40%)</u> Half Drain Time : 646 minutes. <table><tr><th>Storm Event</th><th>Max Level (m)</th><th>Max Depth (m)</th><th>Max Infiltration (l/s)</th><th>Max Control (l/s)</th><th>Max Σ Outflow (l/s)</th><th>Max Volume (m³)</th><th>Status</th></tr><tr><td>15 min Summer</td><td>35.057</td><td>0.057</td><td>0.0</td><td>0.3</td><td>0.3</td><td>14.6</td><td>O K</td></tr><tr><td>30 min Summer</td><td>35.073</td><td>0.073</td><td>0.0</td><td>0.4</td><td>0.4</td><td>18.8</td><td>O K</td></tr><tr><td>60 min Summer</td><td>35.090</td><td>0.090</td><td>0.0</td><td>0.4</td><td>0.4</td><td>23.0</td><td>O K</td></tr><tr><td>120 min Summer</td><td>35.110</td><td>0.110</td><td>0.0</td><td>0.5</td><td>0.5</td><td>28.1</td><td>O K</td></tr><tr><td>180 min Summer</td><td>35.120</td><td>0.120</td><td>0.0</td><td>0.5</td><td>0.5</td><td>30.7</td><td>O K</td></tr><tr><td>240 min Summer</td><td>35.126</td><td>0.126</td><td>0.0</td><td>0.5</td><td>0.5</td><td>32.1</td><td>O K</td></tr><tr><td>360 min Summer</td><td>35.129</td><td>0.129</td><td>0.0</td><td>0.5</td><td>0.5</td><td>33.1</td><td>O K</td></tr><tr><td>480 min Summer</td><td>35.129</td><td>0.129</td><td>0.0</td><td>0.5</td><td>0.5</td><td>33.0</td><td>O K</td></tr><tr><td>600 min Summer</td><td>35.127</td><td>0.127</td><td>0.0</td><td>0.5</td><td>0.5</td><td>32.6</td><td>O K</td></tr><tr><td>720 min Summer</td><td>35.126</td><td>0.126</td><td>0.0</td><td>0.5</td><td>0.5</td><td>32.2</td><td>O K</td></tr><tr><td>960 min Summer</td><td>35.122</td><td>0.122</td><td>0.0</td><td>0.5</td><td>0.5</td><td>31.2</td><td>O K</td></tr><tr><td>1440 min Summer</td><td>35.114</td><td>0.114</td><td>0.0</td><td>0.5</td><td>0.5</td><td>29.3</td><td>O K</td></tr><tr><td>2160 min Summer</td><td>35.104</td><td>0.104</td><td>0.0</td><td>0.5</td><td>0.5</td><td>26.5</td><td>O K</td></tr><tr><td>2880 min Summer</td><td>35.094</td><td>0.094</td><td>0.0</td><td>0.4</td><td>0.4</td><td>24.2</td><td>O K</td></tr><tr><td>4320 min Summer</td><td>35.080</td><td>0.080</td><td>0.0</td><td>0.4</td><td>0.4</td><td>20.5</td><td>O K</td></tr><tr><td>5760 min Summer</td><td>35.070</td><td>0.070</td><td>0.0</td><td>0.4</td><td>0.4</td><td>17.9</td><td>O K</td></tr><tr><td>15 min Winter</td><td>35.057</td><td>0.057</td><td>0.0</td><td>0.3</td><td>0.3</td><td>14.6</td><td>O K</td></tr><tr><td>30 min Winter</td><td>35.073</td><td>0.073</td><td>0.0</td><td>0.4</td><td>0.4</td><td>18.8</td><td>O K</td></tr><tr><td>60 min Winter</td><td>35.090</td><td>0.090</td><td>0.0</td><td>0.4</td><td>0.4</td><td>23.0</td><td>O K</td></tr><tr><td>120 min Winter</td><td>35.110</td><td>0.110</td><td>0.0</td><td>0.5</td><td>0.5</td><td>28.2</td><td>O K</td></tr></table> <table><tr><th>Storm Event</th><th>Rain (mm/hr)</th><th>Flooded Volume (m³)</th><th>Discharge Volume (m³)</th><th>Time-Peak (mins)</th></tr><tr><td>15 min Summer</td><td>159.600</td><td>0.0</td><td>11.7</td><td>19</td></tr><tr><td>30 min Summer</td><td>103.600</td><td>0.0</td><td>15.6</td><td>34</td></tr><tr><td>60 min Summer</td><td>64.260</td><td>0.0</td><td>22.0</td><td>64</td></tr><tr><td>120 min Summer</td><td>40.530</td><td>0.0</td><td>28.0</td><td>122</td></tr><tr><td>180 min Summer</td><td>30.343</td><td>0.0</td><td>31.6</td><td>182</td></tr><tr><td>240 min Summer</td><td>24.465</td><td>0.0</td><td>34.0</td><td>242</td></tr><tr><td>360 min Summer</td><td>17.780</td><td>0.0</td><td>37.1</td><td>360</td></tr><tr><td>480 min Summer</td><td>14.023</td><td>0.0</td><td>38.9</td><td>448</td></tr><tr><td>600 min Summer</td><td>11.606</td><td>0.0</td><td>40.2</td><td>498</td></tr><tr><td>720 min Summer</td><td>9.917</td><td>0.0</td><td>41.2</td><td>556</td></tr><tr><td>960 min Summer</td><td>7.702</td><td>0.0</td><td>42.4</td><td>682</td></tr><tr><td>1440 min Summer</td><td>5.372</td><td>0.0</td><td>43.7</td><td>952</td></tr><tr><td>2160 min Summer</td><td>3.735</td><td>0.0</td><td>48.6</td><td>1360</td></tr><tr><td>2880 min Summer</td><td>2.890</td><td>0.0</td><td>50.0</td><td>1760</td></tr><tr><td>4320 min Summer</td><td>2.028</td><td>0.0</td><td>52.0</td><td>2512</td></tr><tr><td>5760 min Summer</td><td>1.588</td><td>0.0</td><td>55.9</td><td>3288</td></tr><tr><td>15 min Winter</td><td>159.600</td><td>0.0</td><td>11.7</td><td>19</td></tr><tr><td>30 min Winter</td><td>103.600</td><td>0.0</td><td>15.6</td><td>33</td></tr><tr><td>60 min Winter</td><td>64.260</td><td>0.0</td><td>22.0</td><td>62</td></tr><tr><td>120 min Winter</td><td>40.530</td><td>0.0</td><td>28.0</td><td>120</td></tr></table>								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	35.057	0.057	0.0	0.3	0.3	14.6	O K	30 min Summer	35.073	0.073	0.0	0.4	0.4	18.8	O K	60 min Summer	35.090	0.090	0.0	0.4	0.4	23.0	O K	120 min Summer	35.110	0.110	0.0	0.5	0.5	28.1	O K	180 min Summer	35.120	0.120	0.0	0.5	0.5	30.7	O K	240 min Summer	35.126	0.126	0.0	0.5	0.5	32.1	O K	360 min Summer	35.129	0.129	0.0	0.5	0.5	33.1	O K	480 min Summer	35.129	0.129	0.0	0.5	0.5	33.0	O K	600 min Summer	35.127	0.127	0.0	0.5	0.5	32.6	O K	720 min Summer	35.126	0.126	0.0	0.5	0.5	32.2	O K	960 min Summer	35.122	0.122	0.0	0.5	0.5	31.2	O K	1440 min Summer	35.114	0.114	0.0	0.5	0.5	29.3	O K	2160 min Summer	35.104	0.104	0.0	0.5	0.5	26.5	O K	2880 min Summer	35.094	0.094	0.0	0.4	0.4	24.2	O K	4320 min Summer	35.080	0.080	0.0	0.4	0.4	20.5	O K	5760 min Summer	35.070	0.070	0.0	0.4	0.4	17.9	O K	15 min Winter	35.057	0.057	0.0	0.3	0.3	14.6	O K	30 min Winter	35.073	0.073	0.0	0.4	0.4	18.8	O K	60 min Winter	35.090	0.090	0.0	0.4	0.4	23.0	O K	120 min Winter	35.110	0.110	0.0	0.5	0.5	28.2	O K	Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	15 min Summer	159.600	0.0	11.7	19	30 min Summer	103.600	0.0	15.6	34	60 min Summer	64.260	0.0	22.0	64	120 min Summer	40.530	0.0	28.0	122	180 min Summer	30.343	0.0	31.6	182	240 min Summer	24.465	0.0	34.0	242	360 min Summer	17.780	0.0	37.1	360	480 min Summer	14.023	0.0	38.9	448	600 min Summer	11.606	0.0	40.2	498	720 min Summer	9.917	0.0	41.2	556	960 min Summer	7.702	0.0	42.4	682	1440 min Summer	5.372	0.0	43.7	952	2160 min Summer	3.735	0.0	48.6	1360	2880 min Summer	2.890	0.0	50.0	1760	4320 min Summer	2.028	0.0	52.0	2512	5760 min Summer	1.588	0.0	55.9	3288	15 min Winter	159.600	0.0	11.7	19	30 min Winter	103.600	0.0	15.6	33	60 min Winter	64.260	0.0	22.0	62	120 min Winter	40.530	0.0	28.0	120
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																																																																																																																																																																																																																																																																																	
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480 min Summer	14.023	0.0	38.9	448																																																																																																																																																																																																																																																																																				
600 min Summer	11.606	0.0	40.2	498																																																																																																																																																																																																																																																																																				
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960 min Summer	7.702	0.0	42.4	682																																																																																																																																																																																																																																																																																				
1440 min Summer	5.372	0.0	43.7	952																																																																																																																																																																																																																																																																																				
2160 min Summer	3.735	0.0	48.6	1360																																																																																																																																																																																																																																																																																				
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XP Solutions		Source Control 2020.1

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
180 min Winter	35.120	0.120	0.0	0.5	0.5	30.8	O K
240 min Winter	35.126	0.126	0.0	0.5	0.5	32.2	O K
360 min Winter	35.130	0.130	0.0	0.5	0.5	33.3	O K
480 min Winter	35.130	0.130	0.0	0.5	0.5	33.2	O K
600 min Winter	35.127	0.127	0.0	0.5	0.5	32.6	O K
720 min Winter	35.125	0.125	0.0	0.5	0.5	32.1	O K
960 min Winter	35.121	0.121	0.0	0.5	0.5	30.9	O K
1440 min Winter	35.111	0.111	0.0	0.5	0.5	28.4	O K
2160 min Winter	35.097	0.097	0.0	0.4	0.4	24.8	O K
2880 min Winter	35.086	0.086	0.0	0.4	0.4	21.9	O K
4320 min Winter	35.069	0.069	0.0	0.4	0.4	17.5	O K
5760 min Winter	35.057	0.057	0.0	0.3	0.3	14.6	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
180 min Winter	30.343	0.0	31.6	178
240 min Winter	24.465	0.0	34.0	236
360 min Winter	17.780	0.0	37.1	348
480 min Winter	14.023	0.0	38.9	456
600 min Winter	11.606	0.0	40.2	550
720 min Winter	9.917	0.0	41.2	570
960 min Winter	7.702	0.0	42.4	722
1440 min Winter	5.372	0.0	43.7	1024
2160 min Winter	3.735	0.0	48.6	1452
2880 min Winter	2.890	0.0	50.0	1872
4320 min Winter	2.028	0.0	52.0	2640
5760 min Winter	1.588	0.0	55.9	3400

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4 Pear Tree Court London EC1R 0DS	2006 - 9 Nestles Avenue Proposed Surface Water Drainage Network																			
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Source Control 2020.1																				
<u>Model Details</u> Storage is Online Cover Level (m) 35.500 <u>Cellular Storage Structure</u> Invert Level (m) 35.000 Safety Factor 2.0 Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.80 Infiltration Coefficient Side (m/hr) 0.00000 <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Depth (m)</th> <th>Area (m²)</th> <th>Inf. Area (m²)</th> <th>Depth (m)</th> <th>Area (m²)</th> <th>Inf. Area (m²)</th> </tr> </thead> <tbody> <tr> <td>0.000</td> <td>320.0</td> <td>0.0</td> <td>0.131</td> <td>0.0</td> <td>0.0</td> </tr> <tr> <td>0.130</td> <td>320.0</td> <td>0.0</td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <u>Orifice Outflow Control</u> Diameter (m) 0.027 Discharge Coefficient 0.600 Invert Level (m) 35.000			Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)	0.000	320.0	0.0	0.131	0.0	0.0	0.130	320.0	0.0			
Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)															
0.000	320.0	0.0	0.131	0.0	0.0															
0.130	320.0	0.0																		
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Drainage Network

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

Half Drain Time : 712 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	30.829	0.169	0.0	1.5	1.5	52.3	O K
30 min Summer	30.876	0.216	0.0	1.5	1.5	67.1	O K
60 min Summer	30.923	0.263	0.0	1.5	1.5	81.4	O K
120 min Summer	30.979	0.319	0.0	1.5	1.5	99.0	O K
180 min Summer	31.009	0.349	0.0	1.5	1.5	108.1	O K
240 min Summer	31.027	0.367	0.0	1.5	1.5	113.6	O K
360 min Summer	31.042	0.382	0.0	1.5	1.5	118.6	O K
480 min Summer	31.044	0.384	0.0	1.5	1.5	118.9	O K
600 min Summer	31.038	0.378	0.0	1.5	1.5	117.1	O K
720 min Summer	31.029	0.369	0.0	1.5	1.5	114.5	O K
960 min Summer	31.009	0.349	0.0	1.5	1.5	108.2	O K
1440 min Summer	30.969	0.309	0.0	1.5	1.5	95.8	O K
2160 min Summer	30.915	0.255	0.0	1.5	1.5	79.1	O K
2880 min Summer	30.865	0.205	0.0	1.5	1.5	63.6	O K
4320 min Summer	30.772	0.112	0.0	1.5	1.5	34.9	O K
5760 min Summer	30.717	0.057	0.0	1.5	1.5	17.7	O K
15 min Winter	30.829	0.169	0.0	1.5	1.5	52.3	O K
30 min Winter	30.877	0.217	0.0	1.5	1.5	67.1	O K
60 min Winter	30.923	0.263	0.0	1.5	1.5	81.5	O K
120 min Winter	30.980	0.320	0.0	1.5	1.5	99.3	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	159.600	0.0	84.1	19
30 min Summer	103.600	0.0	100.2	34
60 min Summer	64.260	0.0	123.7	64
120 min Summer	40.530	0.0	146.2	122
180 min Summer	30.343	0.0	159.7	182
240 min Summer	24.465	0.0	168.9	242
360 min Summer	17.780	0.0	180.8	362
480 min Summer	14.023	0.0	188.2	482
600 min Summer	11.606	0.0	193.4	600
720 min Summer	9.917	0.0	197.5	720
960 min Summer	7.702	0.0	203.1	838
1440 min Summer	5.372	0.0	210.9	1066
2160 min Summer	3.735	0.0	218.2	1448
2880 min Summer	2.890	0.0	224.2	1820
4320 min Summer	2.028	0.0	233.8	2552
5760 min Summer	1.588	0.0	242.5	3224
15 min Winter	159.600	0.0	84.1	19
30 min Winter	103.600	0.0	100.2	33
60 min Winter	64.260	0.0	123.6	62
120 min Winter	40.530	0.0	146.2	120

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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
180 min Winter	31.010	0.350	0.0	1.5	1.5	108.6	O K
240 min Winter	31.028	0.368	0.0	1.5	1.5	114.2	O K
360 min Winter	31.045	0.385	0.0	1.5	1.5	119.4	O K
480 min Winter	31.048	0.388	0.0	1.5	1.5	120.3	O K
600 min Winter	31.044	0.384	0.0	1.5	1.5	119.0	O K
720 min Winter	31.036	0.376	0.0	1.5	1.5	116.5	O K
960 min Winter	31.014	0.354	0.0	1.5	1.5	109.8	O K
1440 min Winter	30.970	0.310	0.0	1.5	1.5	96.1	O K
2160 min Winter	30.904	0.244	0.0	1.5	1.5	75.6	O K
2880 min Winter	30.834	0.174	0.0	1.5	1.5	53.9	O K
4320 min Winter	30.710	0.050	0.0	1.5	1.5	15.6	O K
5760 min Winter	30.661	0.001	0.0	1.5	1.5	0.3	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
180 min Winter	30.343	0.0	159.8	180
240 min Winter	24.465	0.0	168.9	238
360 min Winter	17.780	0.0	180.8	356
480 min Winter	14.023	0.0	188.2	470
600 min Winter	11.606	0.0	193.6	584
720 min Winter	9.917	0.0	197.5	694
960 min Winter	7.702	0.0	203.2	902
1440 min Winter	5.372	0.0	210.8	1108
2160 min Winter	3.735	0.0	218.2	1536
2880 min Winter	2.890	0.0	224.1	1960
4320 min Winter	2.028	0.0	233.9	2572
5760 min Winter	1.588	0.0	242.7	2944

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Date 24/07/2020 12:59 File 2006 - Combined Model -...	Designed by AGH Checked by CL	
XP Solutions Source Control 2020.1		

Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 510000 179000 TQ 10000 79000
Data Type	
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.950
Cv (Winter)	0.950
Shortest Storm (mins)	15
Longest Storm (mins)	5760
Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.142

Time (mins)		Area
From:	To:	(ha)
0	4	0.142

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Date 24/07/2020 12:59 File 2006 - Combined Model -...	Designed by AGH Checked by CL	
XP Solutions	Source Control 2020.1	

Model Details

Storage is Online Cover Level (m) 31.460

Cellular Storage Structure

Invert Level (m) 30.660 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 1.00
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	310.0	0.0	0.501	0.0	0.0
0.500	310.0	0.0			

Hydro-Brake® Optimum Outflow Control

Unit Reference MD-SHE-0064-1500-0552-1500
Design Head (m) 0.552
Design Flow (l/s) 1.5
Flush-Flo™ Calculated
Objective Minimise upstream storage
Application Surface
Sump Available Yes
Diameter (mm) 64
Invert Level (m) 30.460
Minimum Outlet Pipe Diameter (mm) 100
Suggested Manhole Diameter (mm) 1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.552	1.5
Flush-Flo™	0.164	1.5
Kick-Flo®	0.365	1.2
Mean Flow over Head Range	-	1.3

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	1.4	1.200	2.1	3.000	3.2	7.000	4.9
0.200	1.5	1.400	2.3	3.500	3.5	7.500	5.0
0.300	1.4	1.600	2.4	4.000	3.7	8.000	5.2
0.400	1.3	1.800	2.6	4.500	3.9	8.500	5.4
0.500	1.4	2.000	2.7	5.000	4.1	9.000	5.5
0.600	1.6	2.200	2.8	5.500	4.3	9.500	5.7
0.800	1.8	2.400	2.9	6.000	4.5		
1.000	2.0	2.600	3.0	6.500	4.7		

Appendix I

Overland Flows

Appendix J

Thames Water Pre-development
correspondence



Mr A McNaughton
Mecserve
83 Blackfriars rd
London SE1 8HA



Our ref: DS6076132



0800 009 3921
Monday to Friday, 8am to 5pm

29th July 2020

Pre-planning enquiry: Wastewater Capacity check

Dear Mr McNaughton

Thank you for providing details of your development with the Pre-Planning application dated 23rd July 20 for development @ 9 Nestles Avenue UB3 4SA

Existing brownfld site ,developed to { 103 Flats } as per your above application.

We have completed the assessment of the foul water flows and surface water run-off based on the information submitted in your application with the purpose of assessing sewerage capacity within the existing Thames Water sewer network, in liaison with TW Asset Planners.

Foul

If your proposals progress in line with the details you've provided as above, we're pleased to confirm that there will be sufficient sewerage capacity in the nearest TW foul sewer network to serve your foul discharges from your development, provided it is by gravity.

This confirmation is valid for 12 months or for the life of any planning approval that this information is used to support, to a maximum of three years.

You'll need to keep us informed of any changes to your design – for example, an increase in the number or density of homes. Such changes could mean there is no longer sufficient capacity and has to be investigated again.

Surface Water

When developing a site, policy 5.13 of the London Plan and Policy 3.4 of the Supplementary Planning Guidance (Sustainable Design And Construction) states that every attempt should be made to use flow attenuation and SuDS/Storage to reduce the surface water discharge from the site as much as possible.

In accordance with the Building Act 2000 Clause H3.3, positive connection of surface water 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. Before we can consider your surface water needs, you'll need written approval from the lead local flood authority that you have

followed the sequential approach to the disposal of surface water and considered all practical means.

The disposal hierarchy being:

1. store rainwater for later use.
2. use infiltration techniques where possible.
3. attenuate rainwater in ponds or open water features for gradual release.
4. attenuate rainwater by storing in tanks or sealed water features for gradual release.
5. discharge rainwater direct to a watercourse.
6. discharge rainwater to a surface water sewer/drain.
7. discharge rainwater to the combined sewer.
8. discharge rainwater to the foul sewer

Where connection to the public sewerage network is still required to manage surface water flows we will accept these flows at a discharge rate in line with **CIRIA's best practice guide on SuDS or that stated within the sites planning approval.**

If the above surface water hierarchy has been followed and if the flows are restricted to a total of 3.8 l/s to TW surface water sewer network, then Thames Water would not have any objections to the proposal. We have noted that the impermeable area of this site is only 0.224 HA ;

Please see the attached 'Planning your wastewater' leaflet for additional information. At the appropriate time, you will have to apply for a S106 connection application to DS Connection team

This confirmation is valid for 12 months or for the life of any planning approval that this information is used to support, to a maximum of three years.

Please note that you must keep us informed of any changes to your design – for example, an increase in the number or density of homes. Such changes could mean there is no longer sufficient sewerage capacity.



Planning your wastewater

What happens next?

Please make sure you submit your connection application, when you are ready, giving us at least 21 days' notice of the date you wish to make your new connection/s.

If you've any further questions, please contact me.

Yours sincerely

Siva Sivarajan

Developer Services- Wastewater Adoptions Engineer
Office: 0203 577 7752 Mobile: 07747842608
siva.sivarajan@thameswater.co.uk

Thames Water Utilities Ltd, Clearwater Court, Vastern Road, Reading, Berkshire, RG1 8DB
Find us online at developers.thameswater.co.uk



TW Int ref : DTS 59072

We've put together some information on sewerage to help you plan your new development.

How long does it take to get consent to connect to a sewer?

If you're applying for consent to connect to a sewer under Section 106 of the Water Industry Act 1991, you'll need to give us 21 days' notice.

I think I'll need to connect to a trunk sewer – is that possible?

Connecting directly to trunk sewers can be complex and dangerous, and we won't permit this at all in London. If you're considering a trunk sewer as a point of connection, please contact us as soon as possible to discuss.

How do I handle trade effluent and groundwater discharges?

You mustn't discharge non-domestic waste to our sewers without a valid trade effluent consent - doing this is an offence under Section 109(1) of the Water Industry Act 1991. You can call our trade effluent team on 0203 577 9200 to get help with trade effluent consents and ground water discharge permits.

Where can I discharge surface water?

The Lead Local Flood Authority, or if you are in a London Borough, 'The London Plan', advises that your development should utilise sustainable drainage systems (SuDS) unless there are practical reasons for not doing so. You should aim to achieve greenfield run-off rates and ensure you manage surface water run-off as close to its source as possible in line with the following drainage hierarchy:

- 1 Store rainwater for later use.
- 2 Use infiltration techniques, such as porous surfaces in non-clay areas.
- 3 Attenuate rainwater in ponds or open water features for gradual release.
- 4 Attenuate rainwater by storing in tanks or sealed water features for gradual release.
- 5 Discharge rainwater direct to a watercourse.
- 6 Discharge rainwater to a surface water sewer or drain.
- 7 Discharge rainwater to a combined sewer.

Please note that if you're discharging surface water anywhere other than to a public sewer – such as to a watercourse – you'll need approval from the relevant authority, for example the Environment Agency, the local authority or the Canals and Rivers Trust.

If you don't follow the surface water hierarchy you may not be granted planning permission, and Thames Water may seek to put conditions on the planning application.

There's no right of discharge of highway drainage into the public sewerage system, and we'd need to agree this with the relevant highway authority under Section 115 of the Water Industry Act 1991. You can contact us to discuss this further.

What can I do about redundant sewers and rising mains on my site?

On brownfield sites where existing sewers or rising mains need to be made redundant or diverted, the developer will need to fund the work, as set out in Section 185 of the Water Industry Act. If there's no practical way of making a diversion, we'll apply the standoff distances in Sewers for Adoption 7th edition to assess the width of easement required.



Planning your wastewater

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Appendix K

SuDS Flows and Volumes – Hillingdon LLFA
Technical Assessment Proformance