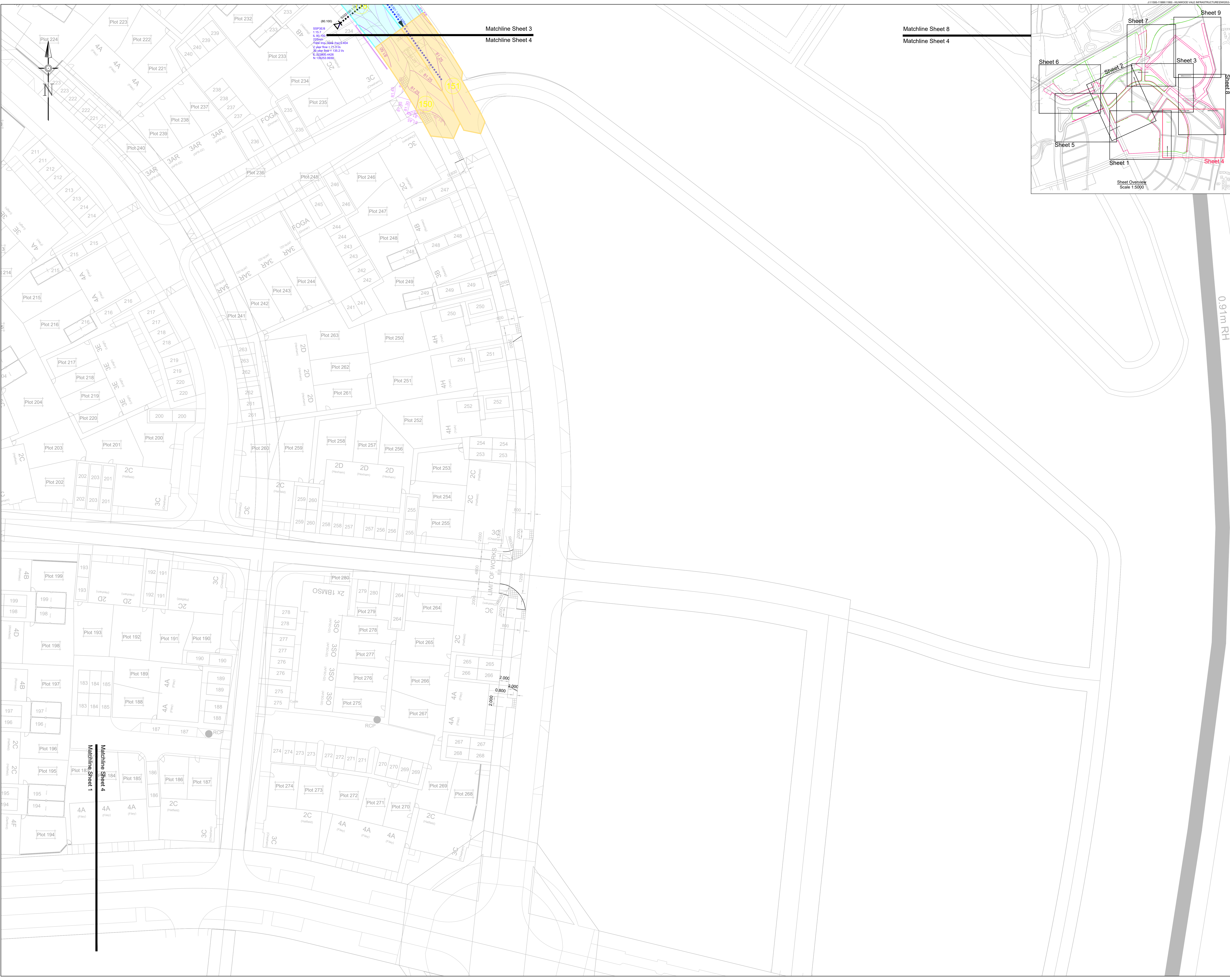
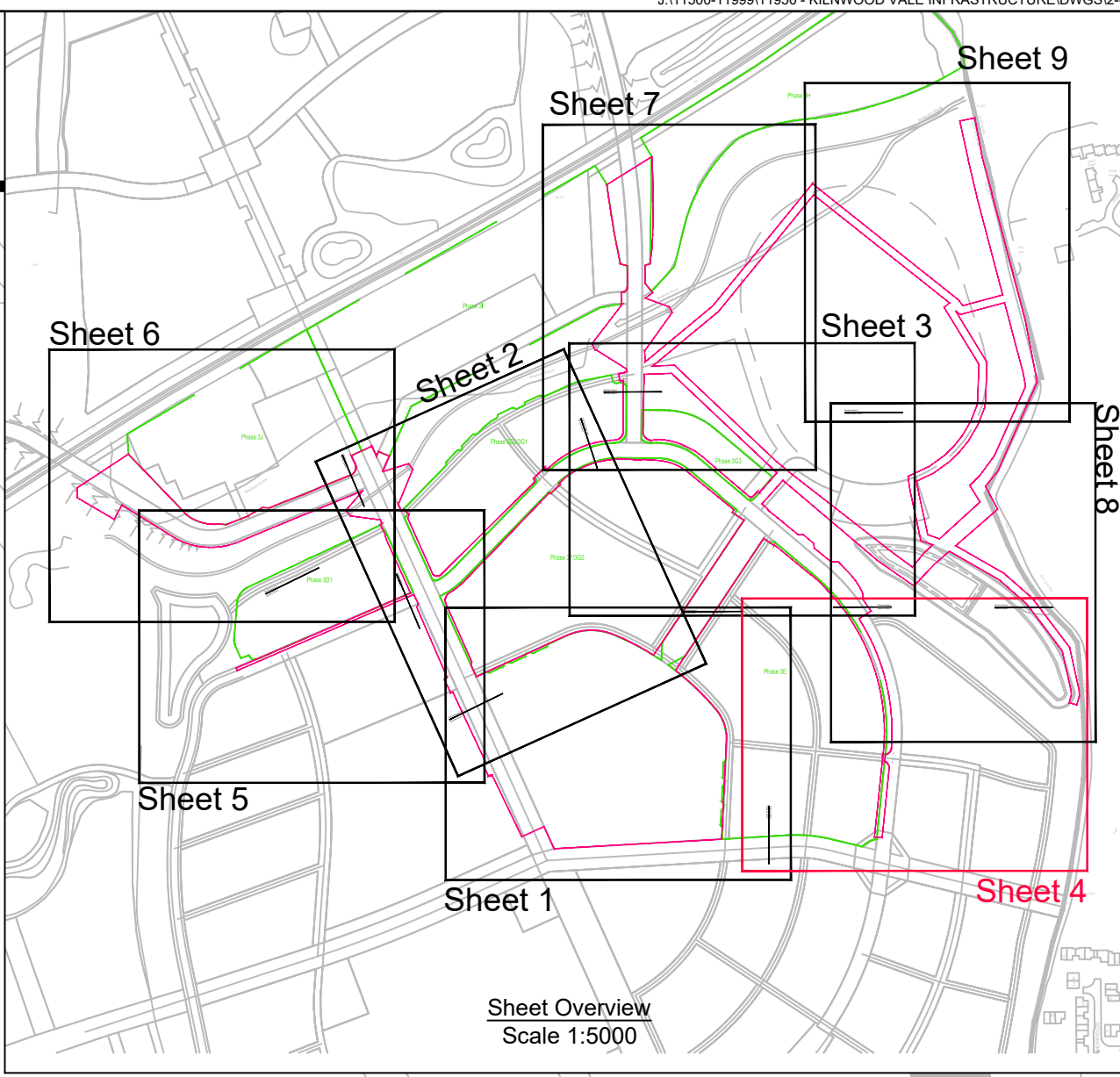




Matchline Sheet 8
Matchline Sheet 4



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 6. Drawing status:
Work in progress
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 9. This drawing is to be read in conjunction with others in the CampbellReith 11950-RI series.
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 11. Temporary terminations of carriageway to be retained by sacrificial kerb laid flush with surface.
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 15. Topsoil to be removed prior to commencement of any construction work.
 16. Engineering fill material to be placed, compared and tested in accordance with specification.

- Legend**
- Surface water drainage
 - Surface water gully and connection
 - Proposed finished level contour
84.75
 - Gully catchment area
 - Gully catchment to existing gully
 - Landscape catchment area
 - Sports pitch area
 - Linear drain catchment area
 - Low point
LP
 - Surface water linear drain
LD

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Job Title

Kilnwood Vale, Crawley

Client

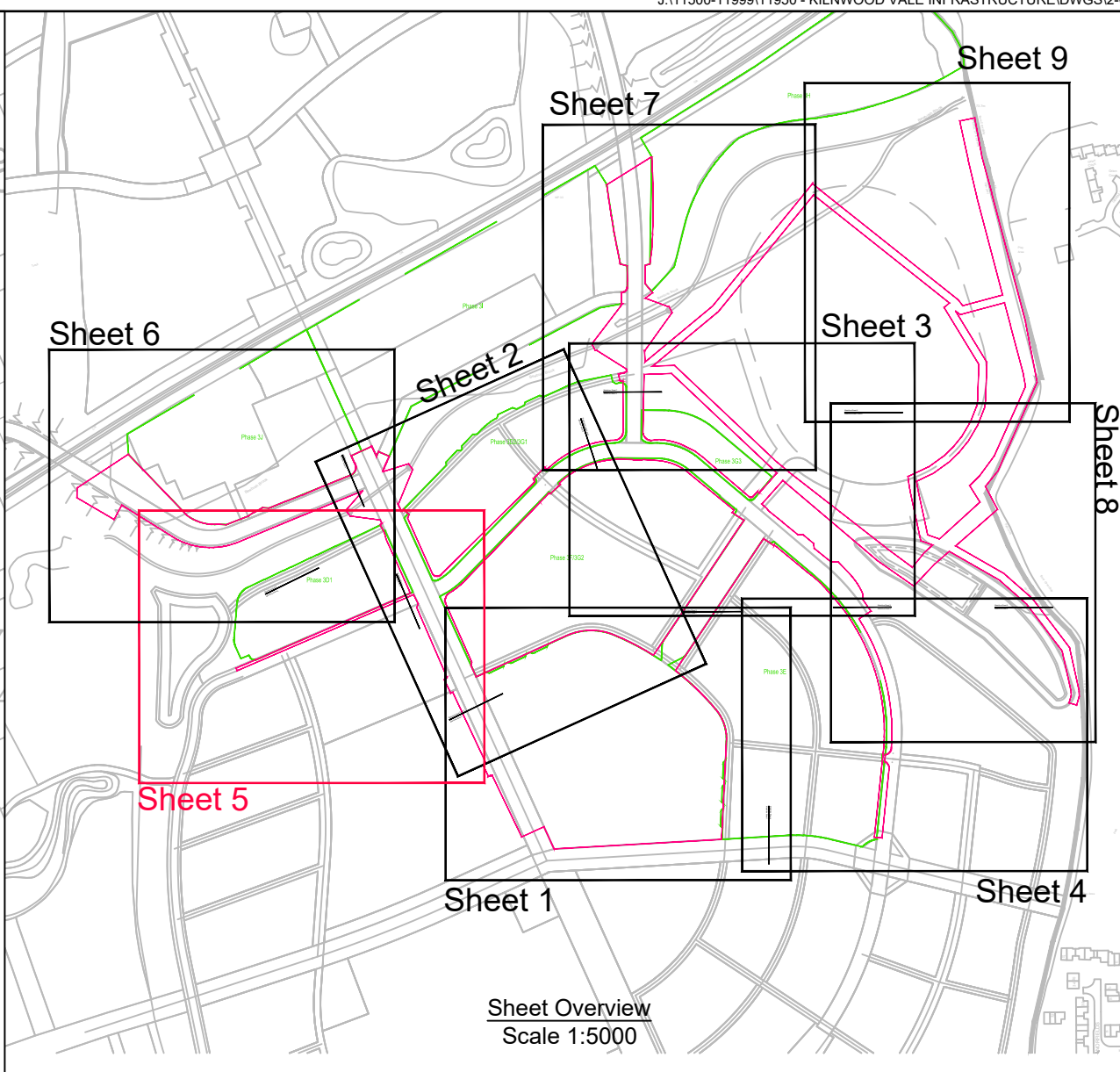
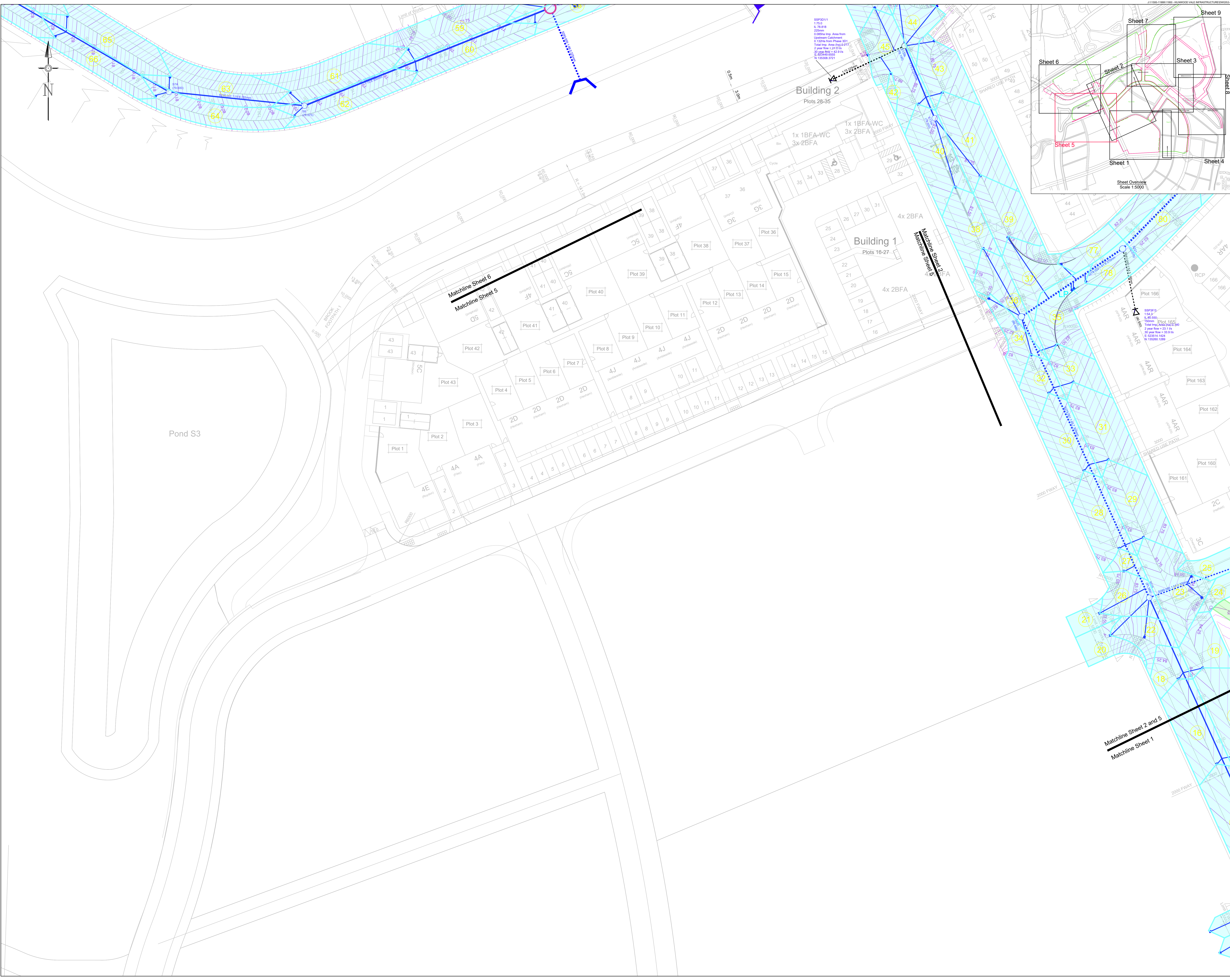
Crest Nicholson

Remaining Infrastructure

Gully Catchment Plan

Sheet 4 of 7

Drawn by	Date made	Scale @ A0	Checked by	Suitability	CR Project
NB	05.04.23	1:250		S2	11950
Project No.	Originator	Volume	Lvl/Loc	Type	Role
11950	CRH	RI	XX	DR	C
					Number
					5064
					Rev
					P1



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- Work Stages:**

2 - Concept.	3 - Definition.	4 - Design.	5 - Build & commission.	6 - Handover
---------------------	------------------------	--------------------	--------------------------------	---------------------
- Only drawings with **revision Cn** and **status A5** to be used for **Construction**.
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Legend

	Surface water drainage
	Surface water gully and connection
	Proposed finished level contour
	Gully catchment area
	Gully catchment to existing gully
	Landscape catchment area
	Sports pitch area
	Linear drain catchment area
	Low point
	Surface water linear drain

P1	Issued for information	27.04.23	NB
Rev	Description	Date	By

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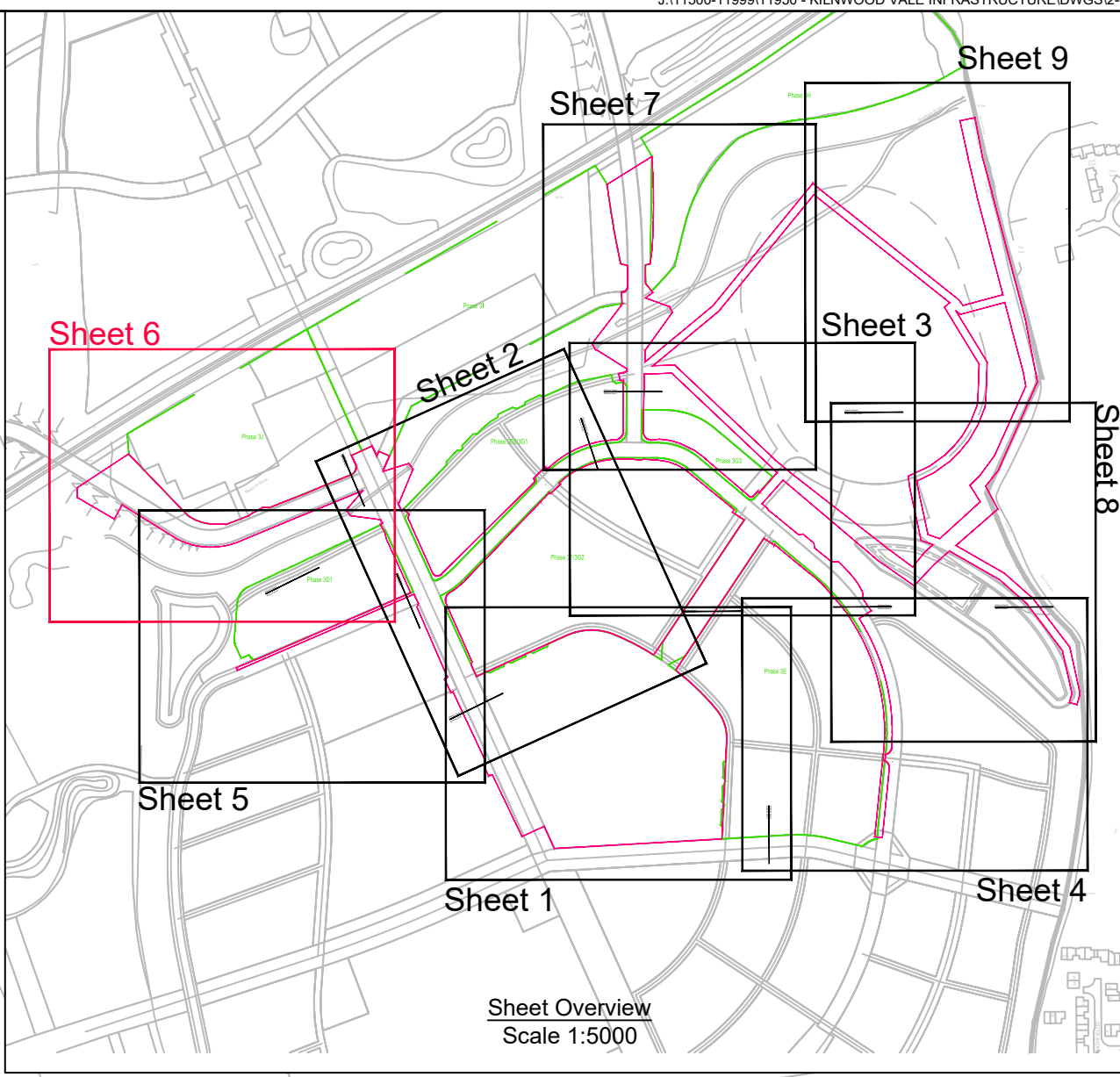
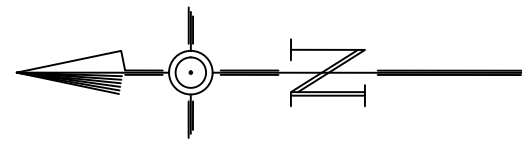
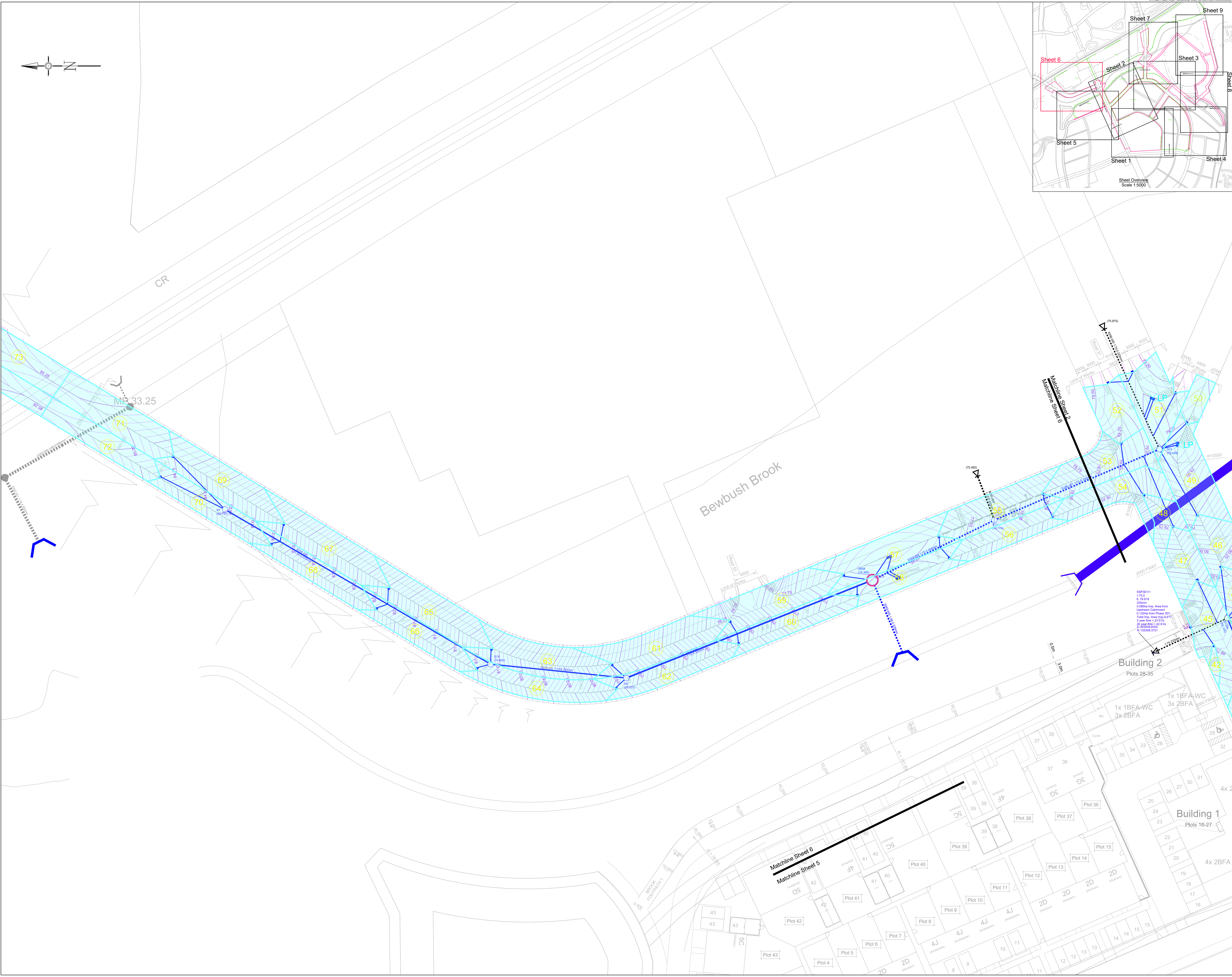
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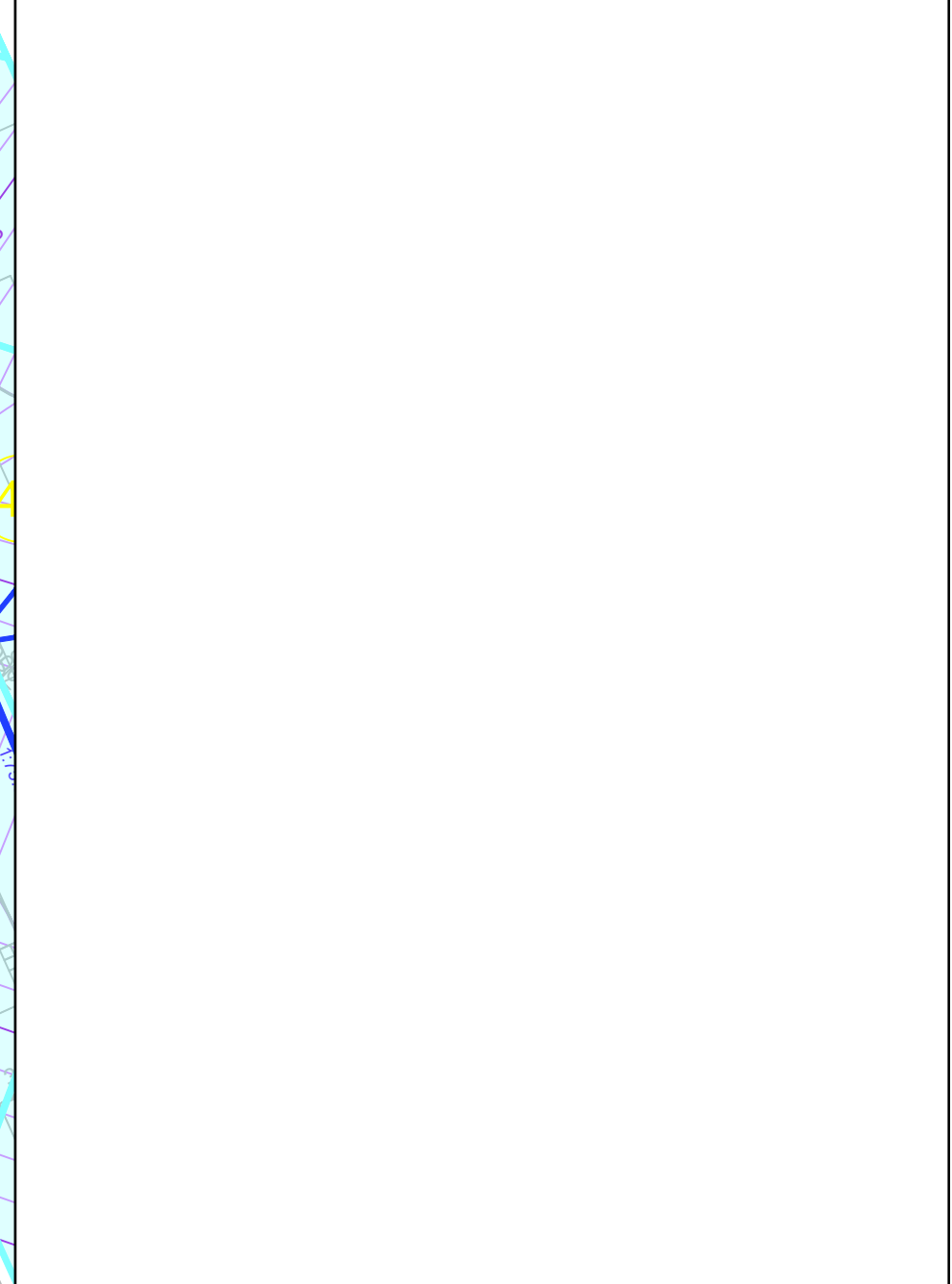
Job Title					
Kilnwood Vale, Crawley					
Client					
Crest Nicholson					
Remaining Infrastructure Gully Catchment Plan Sheet 5 of 7					
Drawn by	Date made	Scale @ A0	Checked by	Suitability	CR Project
NB	05.04.23	1:250		S2	11950
Project No.	Originator	Volume	Lvl/Loc	Type	Role
11950	CRH	RI	XX	DR	C
					Number
					5065
					Rev
					P1

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- Legend**
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 - Surface water gully and connection
 - Proposed finished level contour
 - Gully catchment area
 - Gully catchment to existing gully
 - Landscape catchment area
 - Sports pitch area
 - Linear drain catchment area
 - Low point
 - Surface water linear drain



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Rev	Description	Date	By

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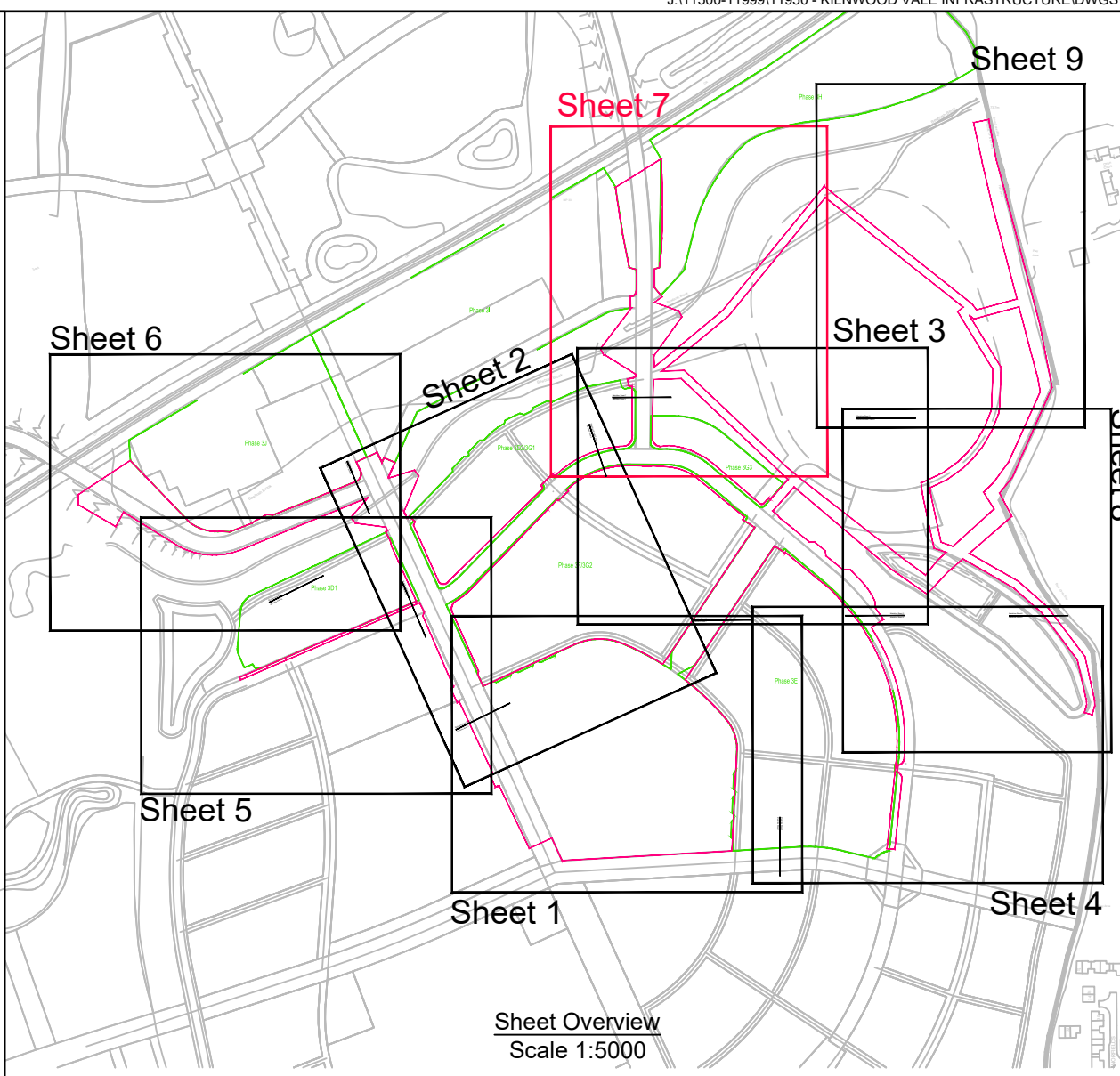
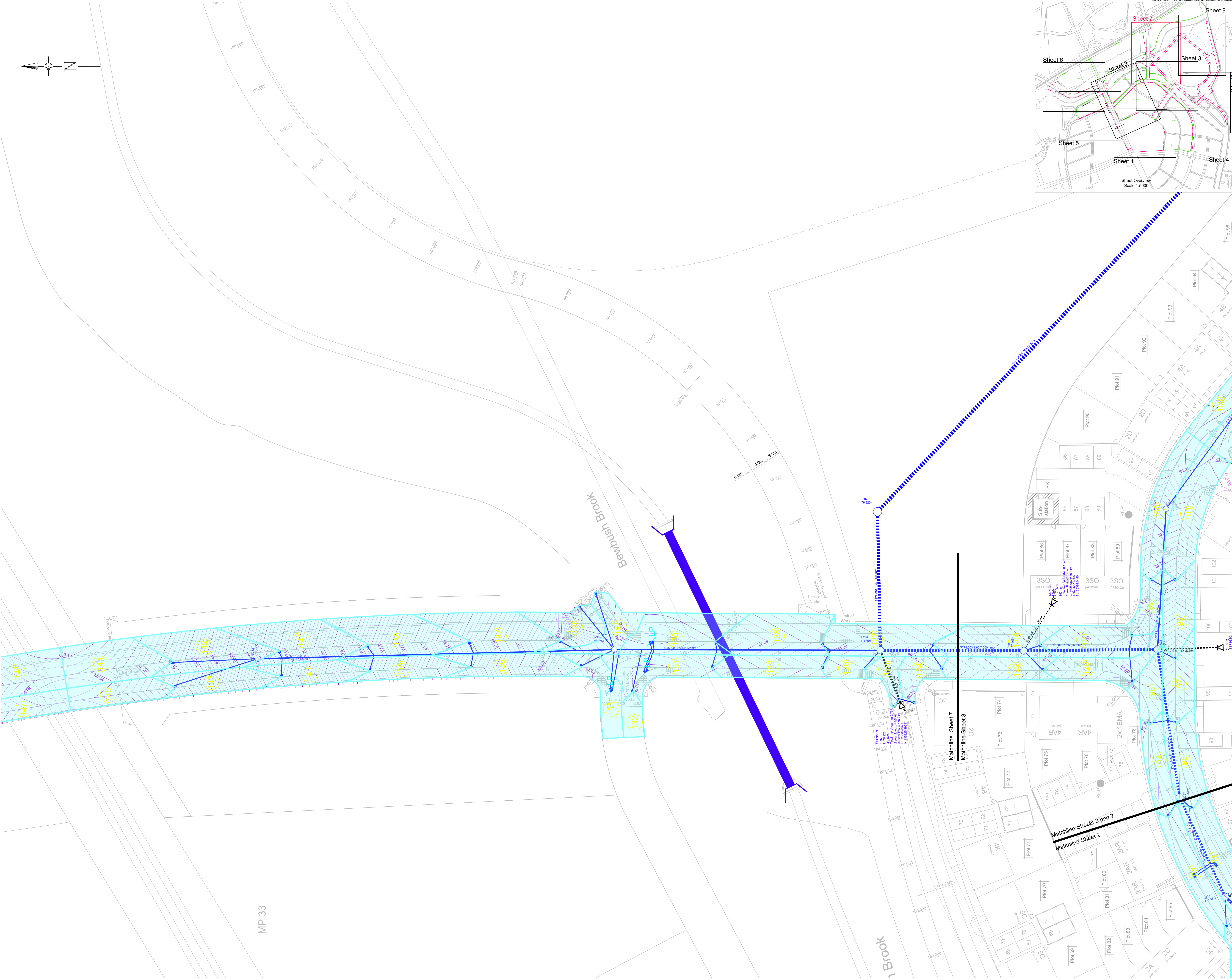
Job Title
Kilnwood Vale, Crawley

Client
Crest Nicholson

**Remaining Infrastructure
Gully Catchment Plan
Sheet 6 of 7**

Drawn by	Date made	Scale @ A0	Checked by	Suitability	CR Project	
NB	05.04.23	1:250		S2	11950	

Project No.	Originator	Volume	Lvl/Loc	Type	Role	Number	Rev
11950	CRH	RI	XX	DR	C	5066	P1



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P:Preliminary Evolving drawings for approvals, tenders, billings etc.
C: Contractual Drawings authorized and approved for stage completion i.e. Stage-Tender or Stage 5-Construction.
- Drawing status:**
Work in progress
S0 - Initial status
Shared (Non-contractual)
S1 - Suitable for coordination, **S2** - Suitable for information, **S3** - Suitable for review and comment, **S4** - Suitable for stage approval.
Published (For contractors purposes)
A1, A2 etc - Authorised and accepted ('Y' relates to work stages)
S1, S2 etc - Partial sign-off (with comments)
CR - As constructed record document (Final Construction ONLY). Any deviations to that which is on site is not the liability of CampbellReith)
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Legend

- Surface water drainage
- Surface water gully and connection
- Proposed finished level contour
- Gully catchment area
- Gully catchment to existing gully
- Landscape catchment area
- Sports pitch area
- Linear drain catchment area
- Low point
- Surface water linear drain

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Job Title

Kilwood Vale, Crawley

Client

Crest Nicholson

Remaining Infrastructure

Gully Catchment Plan

Sheet 7 of 7

Drawn by	Date made	Scale @ A0	Checked by	Suitability	CR Project		
NB	05.04.23	1:250		S2	11950		
Project No.	Originator	Volume	Lvl/Loc	Type	Role	Number	Rev
11950	CRH	RI	XX	DR	C	5067	P1

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Impermeable Areas - Gully Catchments	
Ref	Area (m ²)
1	102.7
2	111.0
3	143.3
4	161.9
5	105.2
6	118.3
7	78.2
8	123.9
9	112.1
10	95.0
11	26.3
12	158.1
13	35.6
14	162.5
15	179.5
16	159.6
17	179.8
18	59.1
19	92.8
20	67.0
21	40.0
22	79.7
23	171.0
24	50.6
25	54.2
26	97.4
27	28.9
28	140.4
29	163.1
30	144.9
31	162.9
32	74.1
33	80.7
34	78.4
35	159.3
36	97.3
37	126.9
38	119.4
39	125.5

Impermeable Areas - Gully Catchments	
Ref	Area (m ²)
40	154.2
41	177.3
42	11.4
43	111.9
44	77.7
45	174.3
46	112.5
47	94.9
48	61.1
49	179.9
50	42.0
51	151.4
52	98.8
53	167.1
54	145.0
55	164.1
56	109.4
57	179.8
58	116.8
59	177.6
60	127.9
61	179.3
62	130.6
63	170.3
64	143.9
65	172.1
66	118.6
67	179.3
68	124.4
69	176.5
70	124.7
71	179.1
72	127.7
73	161.6
74	120.8
75	112.4
76	69.8
77	62.8
78	69.5

Impermeable Areas - Gully Catchments	
Ref	Area (m ²)
79	147.9
80	126.6
81	88.7
82	180.7
83	131.7
84	125.7
85	179.2
86	85.5
87	69.5
88	123.4
89	29.4
90	29.1
91	98.2
92	131.0
93	177.7
94	94.2
95	123.2
96	70.2
97	99.3
98	105.3
99	61.5
100	147.0
101	179.8
102	96.4
103	134.4
104	127.2
105	179.7
106	62.8
107	40.7
108	144.1
109	178.4
110	18.8
111	87.6
112	179.9
113	144.1
114	176.3
115	154.6
116	176.4
117	155.8

Impermeable Areas - Gully Catchments	
Ref	Area (m ²)
140	175.7
141	89.6
142	178.7
143	100.8
144	170.3
145	98.2
146	176.6
147	98.3
148	179.8
149	98.5
150	162.1
151	143.1
SP1	3120.0
SP2	1320.0
LD1	1384.9
118	122.2
119	103.6
120	118.4
121	130.4
122	105.6
123	148.8
124	59.0
125	45.8
126	45.4
127	171.9
128	179.0
129	106.0
130	179.9
131	135.6
132	37.0
133	95.0
134	93.8
135	100.0
136	116.7
137	178.2
138	178.9
139	98.2

Notes

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Work in progress

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Shared (Non-contractual)

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7. Work Stages:

2 - Concept, 3 - Definition, 4 - Design, 5 - Build & commission, 6 - Handover

8. Only drawings with revision Cn and status A5 to be used for Construction.

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Job Title	Kilnwood Vale, Crawley
Client	Crest Nicholson

Remaining Infrastructure

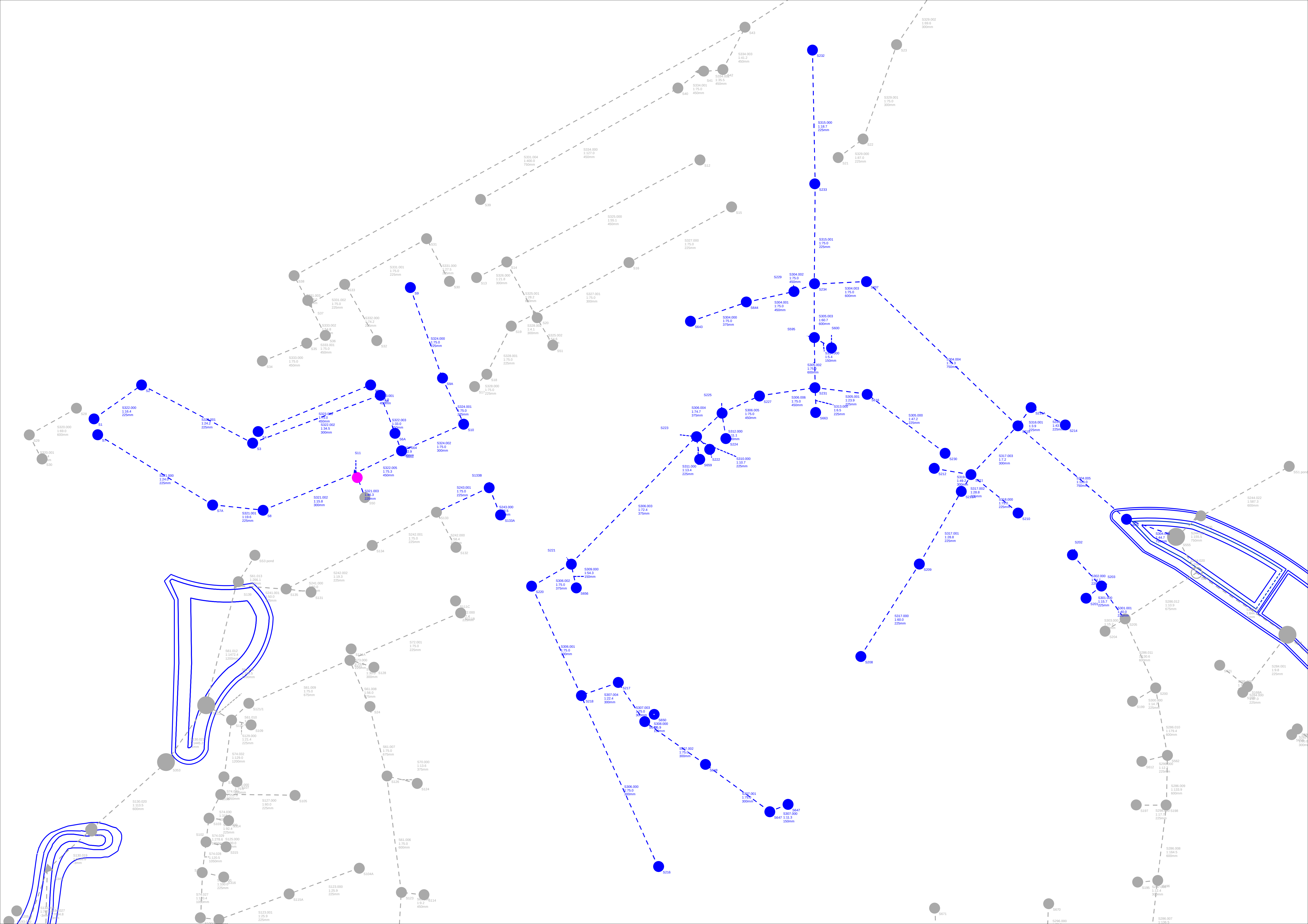
Gully Catchment Areas Schedule

Drawn by	Date made	Scale @ A3	Checked by	Suitability	CR Project
NB	19.04.23	N.T.S.		S2	11950

Project No.	Originator	Volume	Lvl/Loc	Type	Role	Number	Rev
11950	CRH	RI	XX	DR	C	5068	P1

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*Remaining Infrastructure;
MicroDrainage Surface Water Calculations*



STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales			
Return Period (years)	1	PIMP (%)	100
M5-60 (mm)	20.000	Add Flow / Climate Change (%)	0
Ratio R	0.349	Minimum Backdrop Height (m)	0.010
Maximum Rainfall (mm/hr)	50	Maximum Backdrop Height (m)	20.000
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	1.200
Foul Sewage (l/s/ha)	0.000	Min Vel for Auto Design only (m/s)	1.00
Volumetric Runoff Coeff.	0.750	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Time Area Diagram for Storm at outfall SS3 pond (pipe S61.013)

Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	1.949	4-8	8.995	8-12	5.115	12-16	4.877	16-20	0.780	20-24	0.072

Total Area Contributing (ha) = 21.787

Total Pipe Volume (m³) = 3203.433

Time Area Diagram at outfall SS1 pond (pipe S244.022)

Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	1.399	4-8	5.079	8-12	2.651	12-16	3.969	16-20	0.328	20-24	0.089	24-28	0.036

Total Area Contributing (ha) = 13.552

Total Pipe Volume (m³) = 1371.303

Time Area Diagram at outfall S30 (pipe S320.001)

Time (mins)	Area (ha)
----------------	--------------

0-4	0.000
-----	-------

Total Area Contributing (ha) = 0.000

Total Pipe Volume (m³) = 12.919

Time Area Diagram at outfall S50 (pipe S321.003)

Time (mins)	Area (ha)	Time (mins)	Area (ha)
----------------	--------------	----------------	--------------

0-4	0.653	4-8	0.245
-----	-------	-----	-------

Total Area Contributing (ha) = 0.898

Total Pipe Volume (m³) = 46.082

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Raven House 29 Linkfield Lane Surrey RH1 1SS	Remaining Infrastructure Kilnwood Vale Foul Water Calculations	
Date 19/06/2023 File Kilnwood Drainage Model.mdx	Designed by NB Checked by BSF	
XP Solutions	Network 2020.1	

Time Area Diagram at outfall S51 (pipe S325.002)

Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.613	4-8	0.351

Total Area Contributing (ha) = 0.964

Total Pipe Volume (m³) = 41.114

Time Area Diagram at outfall S52 (pipe S329.005)

Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.754	4-8	0.353

Total Area Contributing (ha) = 1.107

Total Pipe Volume (m³) = 25.789

Time Area Diagram at outfall S53 (pipe S331.010)

Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.000	4-8	0.446	8-12	1.080	12-16	0.295

Total Area Contributing (ha) = 1.822

Total Pipe Volume (m³) = 347.098

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)	n	HYD SECT	DIA (mm)	Section Type	Auto Design
S243.000	16.550	0.430	38.5	0.000	5.00	0.0	0.600		o	225	Pipe/Conduit	
S243.001	32.588	0.435	75.0	0.000	0.00	0.0	0.600		o	225	Pipe/Conduit	
S301.000	11.018	0.700	15.7	0.404	5.00	0.0	0.600		o	225	Pipe/Conduit	
S302.000	23.838	0.319	74.7	0.000	5.00	0.0	0.600		o	225	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S243.000	50.00	5.13	79.480	0.000	0.0	0.0	0.0	2.12	84.1	0.0
S243.001	49.09	5.49	79.050	0.000	0.0	0.0	0.0	1.51	60.1	0.0
S301.000	50.00	5.06	80.100	0.404	0.0	0.0	0.0	3.31	131.8	54.7
S302.000	49.99	5.26	79.719	0.000	0.0	0.0	0.0	1.51	60.2	0.0

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	n	HYD SECT	DIA (mm)	Section Type	Auto Design
S301.001	22.713	0.568	40.0	0.061	0.00	0.0	0.600		o	225	Pipe/Conduit	
S304.000	33.106	0.441	75.0	0.400	5.00	0.0		0.040	o	375	Pipe/Conduit	
S304.001	27.332	0.364	75.0	0.200	0.00	0.0		0.040	o	450	Pipe/Conduit	
S304.002	12.363	0.165	75.0	0.177	0.00	0.0	0.600		o	450	Pipe/Conduit	
S305.000	54.756	1.160	47.2	0.098	5.00	0.0	0.600		o	225	Pipe/Conduit	
S305.001	29.521	1.235	23.9	0.000	0.00	0.0	0.600		o	225	Pipe/Conduit	
S306.000	105.128	1.402	75.0	0.237	5.00	0.0	0.600		o	300	Pipe/Conduit	
S307.000	11.013	0.975	11.3	0.131	20.00	0.0	0.600		o	150	Pipe/Conduit	
S307.001	44.814	0.598	75.0	0.138	0.00	0.0	0.600		o	300	Pipe/Conduit	
S307.002	41.653	0.555	75.0	0.000	0.00	0.0	0.600		o	300	Pipe/Conduit	
S308.000	6.689	1.128	5.9	0.313	20.00	0.0	0.600		o	150	Pipe/Conduit	
S307.003	26.484	0.353	75.0	0.000	0.00	0.0	0.600		o	300	Pipe/Conduit	
S307.004	21.962	0.980	22.4	0.000	0.00	0.0	0.600		o	300	Pipe/Conduit	
S306.001	67.388	0.899	75.0	0.000	0.00	0.0	0.600		o	300	Pipe/Conduit	
S306.002	25.480	0.340	75.0	0.174	0.00	0.0	0.600		o	375	Pipe/Conduit	
S309.000	13.581	0.250	54.3	0.140	5.00	0.0	0.600		o	150	Pipe/Conduit	
S306.003	100.184	1.383	72.4	0.122	0.00	0.0	0.600		o	375	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S301.001	49.27	5.44	79.400	0.464	0.0	0.0	0.0	2.07	82.5	62.0
S304.000	47.47	5.93	77.804	0.400	0.0	0.0	0.0	0.60	65.8	51.4
S304.001	45.18	6.60	77.288	0.600	0.0	0.0	0.0	0.67	107.0	73.4
S304.002	44.90	6.69	76.923	0.777	0.0	0.0	0.0	2.35	373.7	94.5
S305.000	49.14	5.48	80.250	0.098	0.0	0.0	0.0	1.91	75.9	13.1
S305.001	48.44	5.66	79.090	0.098	0.0	0.0	0.0	2.69	106.9	13.1
S306.000	47.33	5.96	82.791	0.237	0.0	0.0	0.0	1.82	128.5	30.4
S307.000	25.08	20.06	85.000	0.131	0.0	0.0	0.0	3.01	53.3	8.9
S307.001	24.79	20.47	83.875	0.269	0.0	0.0	0.0	1.82	128.5	18.0
S307.002	24.52	20.85	83.277	0.269	0.0	0.0	0.0	1.82	128.5	18.0
S308.000	25.11	20.03	84.000	0.313	0.0	0.0	0.0	4.17	73.6	21.3
S307.003	24.35	21.10	82.722	0.582	0.0	0.0	0.0	1.82	128.5	38.4
S307.004	24.28	21.21	82.369	0.582	0.0	0.0	0.0	3.34	235.8	38.4
S306.001	23.87	21.82	81.389	0.819	0.0	0.0	0.0	1.82	128.5	52.9
S306.002	23.73	22.03	80.415	0.993	0.0	0.0	0.0	2.09	231.3	63.9
S309.000	50.00	5.17	80.550	0.140	0.0	0.0	0.0	1.37	24.2	18.9
S306.003	23.24	22.81	80.075	1.255	0.0	0.0	0.0	2.13	235.4	79.0

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Raven House 29 Linkfield Lane Surrey RH1 1SS				Remaining Infrastructure Kilnwood Vale Foul Water Calculations			
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Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	n	HYD SECT	DIA (mm)	Section Type	Auto Design
S310.000	10.239	0.958	10.7	0.066	5.00	0.0	0.600		o	225	Pipe/Conduit	
S311.000	12.872	0.958	13.4	0.544	5.00	0.0	0.600		o	225	Pipe/Conduit	
S306.004	19.430	0.260	74.7	0.021	0.00	0.0	0.600		o	375	Pipe/Conduit	
S312.000	14.390	1.293	11.1	0.000	5.00	0.0	0.600		o	300	Pipe/Conduit	
S306.005	23.076	0.308	75.0	0.000	0.00	0.0	0.600		o	450	Pipe/Conduit	
S306.006	31.446	0.419	75.0	0.044	0.00	0.0	0.600		o	450	Pipe/Conduit	
S313.000	13.880	2.145	6.5	0.260	5.00	0.0	0.600		o	225	Pipe/Conduit	
S305.002	28.127	0.375	75.0	0.127	0.00	0.0	0.600		o	600	Pipe/Conduit	
S314.000	11.260	2.095	5.4	0.154	5.00	0.0	0.600		o	150	Pipe/Conduit	
S305.003	30.189	0.497	60.7	0.000	0.00	0.0	0.600		o	600	Pipe/Conduit	
S315.000	74.992	4.000	18.7	0.120	5.00	0.0	0.600		o	225	Pipe/Conduit	
S315.001	55.998	0.747	75.0	0.061	0.00	0.0	0.600		o	225	Pipe/Conduit	
S304.003	29.146	0.388	75.0	0.000	0.00	0.0	0.600		o	600	Pipe/Conduit	
S304.004	117.246	1.558	75.3	0.000	0.00	0.0	0.600		o	750	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S310.000	50.00	5.04	79.800	0.066	0.0	0.0	0.0	4.03	160.1	8.9
S311.000	50.00	5.06	79.800	0.544	0.0	0.0	0.0	3.59	142.7	73.7
S306.004	23.15	22.96	78.692	1.886	0.0	0.0	0.0	2.10	231.7	118.2
S312.000	50.00	5.05	79.800	0.000	0.0	0.0	0.0	4.74	335.0	0.0
S306.005	23.05	23.13	78.357	1.886	0.0	0.0	0.0	2.35	373.7	118.2
S306.006	22.92	23.35	78.049	1.929	0.0	0.0	0.0	2.35	373.7	119.8
S313.000	50.00	5.04	80.000	0.260	0.0	0.0	0.0	5.18	205.9	35.2
S305.002	22.82	23.52	77.480	2.415	0.0	0.0	0.0	2.81	795.7	149.2
S314.000	50.00	5.04	79.650	0.154	0.0	0.0	0.0	4.38	77.3	20.8
S305.003	22.73	23.68	77.105	2.568	0.0	0.0	0.0	3.13	884.5	158.1
S315.000	49.40	5.41	82.475	0.120	0.0	0.0	0.0	3.04	120.7	16.0
S315.001	47.10	6.03	78.475	0.181	0.0	0.0	0.0	1.51	60.1	23.1
S304.003	22.63	23.85	76.608	3.527	0.0	0.0	0.0	2.81	795.4	216.1
S304.004	22.29	24.46	76.220	3.527	0.0	0.0	0.0	3.23	1426.2	216.1

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	n	HYD SECT	DIA (mm)	Section Type	Auto Design
S316.000	21.527	0.500	43.1	0.277	5.00	0.0	0.600		o	225	Pipe/Conduit	
S316.001	12.645	3.215	3.9	0.000	0.00	0.0	0.600		o	225	Pipe/Conduit	
S317.000	61.325	1.022	60.0	0.027	5.00	0.0	0.600		o	225	Pipe/Conduit	
S317.001	47.020	1.633	28.8	0.000	0.00	0.0	0.600		o	225	Pipe/Conduit	
S317.002	10.891	0.378	28.8	0.000	0.00	0.0	0.600		o	225	Pipe/Conduit	
S318.000	34.104	0.455	75.0	0.054	5.00	0.0	0.600		o	225	Pipe/Conduit	
S319.000	20.896	0.425	49.2	0.416	5.00	0.0	0.600		o	300	Pipe/Conduit	
S317.003	37.921	5.233	7.2	0.000	0.00	0.0	0.600		o	300	Pipe/Conduit	
S304.005	80.284	0.637	126.0	0.000	0.00	0.0	0.600		o	750	Pipe/Conduit	
S304.006	29.489	0.660	44.7	0.000	0.00	0.0	0.600		o	750	Pipe/Conduit	
S321.000	75.523	3.150	24.0	0.113	5.00	0.0	0.600		o	225	Pipe/Conduit	
S321.001	28.446	1.450	19.6	0.000	0.00	0.0	0.600		o	225	Pipe/Conduit	
S321.002	55.857	3.532	15.8	0.096	0.00	0.0	0.600		o	300	Pipe/Conduit	
S322.000	32.722	2.000	16.4	0.098	5.00	0.0	0.600		o	225	Pipe/Conduit	
S322.001	70.291	2.900	24.2	0.074	0.00	0.0	0.600		o	225	Pipe/Conduit	
S322.002	76.436	2.216	34.5	0.118	0.00	0.0	0.600		o	300	Pipe/Conduit	
S323.000	68.233	0.910	75.0	0.000	5.00	0.0	0.600		o	450	Pipe/Conduit	
S323.001	7.940	0.106	75.0	0.000	0.00	0.0	0.600		o	450	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S316.000	50.00	5.18	78.750	0.277	0.0	0.0	0.0	2.00	79.5	37.5
S316.001	50.00	5.21	78.250	0.277	0.0	0.0	0.0	6.64	264.2	37.5
S317.000	48.66	5.60	83.300	0.027	0.0	0.0	0.0	1.69	67.3	3.5
S317.001	47.48	5.92	82.278	0.027	0.0	0.0	0.0	2.45	97.3	3.5
S317.002	47.21	6.00	80.645	0.027	0.0	0.0	0.0	2.45	97.3	3.5
S318.000	49.54	5.38	80.723	0.054	0.0	0.0	0.0	1.51	60.1	7.2
S319.000	50.00	5.15	80.618	0.416	0.0	0.0	0.0	2.25	158.9	56.3
S317.003	46.84	6.11	80.193	0.496	0.0	0.0	0.0	5.88	415.3	62.9
S304.005	22.00	24.99	74.662	4.300	0.0	0.0	0.0	2.49	1100.7	256.2
S304.006	21.94	25.11	74.025	4.300	0.0	0.0	0.0	4.19	1852.0	256.2
S321.000	49.17	5.47	82.750	0.113	0.0	0.0	0.0	2.68	106.7	15.1
S321.001	48.56	5.63	79.600	0.113	0.0	0.0	0.0	2.97	118.0	15.1
S321.002	47.70	5.86	78.075	0.210	0.0	0.0	0.0	3.97	280.8	27.1
S322.000	50.00	5.17	82.900	0.098	0.0	0.0	0.0	3.25	129.3	13.3
S322.001	48.65	5.61	80.900	0.172	0.0	0.0	0.0	2.67	106.1	22.7
S322.002	46.92	6.08	77.925	0.290	0.0	0.0	0.0	2.69	189.9	36.9
S323.000	49.12	5.48	76.800	0.000	0.0	0.0	0.0	2.35	373.7	0.0
S323.001	48.90	5.54	75.890	0.000	0.0	0.0	0.0	2.35	373.7	0.0

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Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k	n	HYD SECT	DIA (mm)	Section Type	Auto Design
S322.003	22.866	0.692	33.0	0.265	0.00	0.0	0.600		o	450	Pipe/Conduit	
S322.004	10.461	0.318	32.9	0.000	0.00	0.0	0.600		o	450	Pipe/Conduit	
S324.000	53.847	0.718	75.0	0.104	5.00	0.0	0.600		o	225	Pipe/Conduit	
S324.001	28.434	0.379	75.0	0.000	0.00	0.0	0.600		o	225	Pipe/Conduit	
S324.002	37.879	0.505	75.0	0.000	0.00	0.0	0.600		o	300	Pipe/Conduit	
S322.005	28.678	0.381	75.3	0.000	0.00	0.0	0.600		o	450	Pipe/Conduit	
S321.003	14.477	0.312	46.3	0.029	0.00	0.0	0.600		o	225	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S322.003	46.55	6.19	75.784	0.556	0.0	0.0	0.0	3.55	564.1	70.0
S322.004	46.38	6.24	75.092	0.556	0.0	0.0	0.0	3.55	565.0	70.0
S324.000	48.70	5.59	76.600	0.104	0.0	0.0	0.0	1.51	60.1	13.7
S324.001	47.54	5.91	75.882	0.104	0.0	0.0	0.0	1.51	60.1	13.7
S324.002	46.33	6.25	75.429	0.104	0.0	0.0	0.0	1.82	128.5	13.7
S322.005	45.65	6.46	74.774	0.659	0.0	0.0	0.0	2.35	373.0	81.5
S321.003	45.25	6.58	74.393	0.898	0.0	0.0	0.0	1.93	76.6«	110.0

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Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	PN	Pipe Out Invert Level (m)	Diameter (mm)	PN	Pipes In Invert Level (m)	Diameter (mm)	Backdrop (mm)
S133A	80.980	1.500	Open Manhole	1200	S243.000	79.480	225				
S133B	80.550	1.500	Open Manhole	1200	S243.001	79.050	225	S243.000	79.050	225	
S201	81.651	1.551	Open Manhole	1200	S301.000	80.100	225				
S202	81.144	1.425	Open Manhole	1200	S302.000	79.719	225				
S203	81.419	2.019	Open Manhole	1200	S301.001	79.400	225	S301.000	79.400	225	
								S302.000	79.400	225	
S643	79.517	1.713	Open Manhole	1350	S304.000	77.804	375				
S644	80.075	2.787	Open Manhole	1350	S304.001	77.288	450	S304.000	77.363	375	
S229	80.673	3.750	Open Manhole	1350	S304.002	76.923	450	S304.001	76.923	450	
S230	83.000	2.750	Open Manhole	1200	S305.000	80.250	225				
S616	82.900	3.810	Open Manhole	1200	S305.001	79.090	225	S305.000	79.090	225	
S216	85.230	2.439	Open Manhole	1200	S306.000	82.791	300				
S647	85.492	0.492	Sealed Manhole	450	S307.000	85.000	150				
S647	85.474	1.599	Open Manhole	600	S307.001	83.875	300	S307.000	84.025	150	
S648	85.090	1.812	Open Manhole	600	S307.002	83.277	300	S307.001	83.277	300	
S650	84.735	0.735	Sealed Manhole	450	S308.000	84.000	150				
S649	84.739	2.017	Open Manhole	600	S307.003	82.722	300	S307.002	82.722	300	
								S308.000	82.872	150	
S217	84.283	1.914	Open Manhole	1200	S307.004	82.369	300	S307.003	82.369	300	
S218	83.893	2.504	Open Manhole	1200	S306.001	81.389	300	S306.000	81.389	300	
								S307.004	81.389	300	
S220	82.119	1.704	Open Manhole	1350	S306.002	80.415	375	S306.001	80.490	300	
S656	82.710	2.160	Open Manhole	1200	S309.000	80.550	150				
S221	82.150	2.075	Open Manhole	1350	S306.003	80.075	375	S306.002	80.075	375	
								S309.000	80.300	150	
S222	82.105	2.305	Open Manhole	1200	S310.000	79.800	225				
S659	82.162	2.362	Open Manhole	1200	S311.000	79.800	225				
S223	81.375	2.683	Open Manhole	1350	S306.004	78.692	375	S306.003	78.692	375	
								S310.000	78.842	225	
								S311.000	78.842	225	
S224	82.060	2.260	Open Manhole	1200	S312.000	79.800	300				
S225	81.250	2.893	Open Manhole	1500	S306.005	78.357	450	S306.004	78.432	375	
								S312.000	78.507	300	
S227	81.300	3.251	Open Manhole	1350	S306.006	78.049	450	S306.005	78.049	450	
S663	82.381	2.381	Open Manhole	1200	S313.000	80.000	225				
S231	81.770	4.290	Open Manhole	1500	S305.002	77.480	600	S305.001	77.855	225	
								S306.006	77.630	450	
								S313.000	77.855	225	
S600	81.932	2.282	Open Manhole	1200	S314.000	79.650	150				
S595	81.125	4.020	Open Manhole	1500	S305.003	77.105	600	S305.002	77.105	600	
								S314.000	77.555	150	
S232	83.900	1.425	Open Manhole	1200	S315.000	82.475	225				
S233	80.100	1.625	Open Manhole	1200	S315.001	78.475	225	S315.000	78.475	225	
S234	80.630	4.022	Open Manhole	1500	S304.003	76.608	600	S304.002	76.758	450	

Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	PN	Pipe Out Invert Level (m)	Diameter (mm)	PN	Pipes In Invert Level (m)	Diameter (mm)	Backdrop (mm)
								S305.003	76.608	600	745
								S315.001	77.728	225	
S207	81.663	5.444	Open Manhole	1800	S304.004	76.220	750	S304.003	76.220	600	
S214	81.635	2.885	Open Manhole	1200	S316.000	78.750	225				
S215A	81.861	3.611	Open Manhole	1200	S316.001	78.250	225	S316.000	78.250	225	
S208	84.978	1.678	Open Manhole	1200	S317.000	83.300	225				
S209	84.042	1.764	Open Manhole	1200	S317.001	82.278	225	S317.000	82.278	225	
S211A	83.223	2.577	Open Manhole	1200	S317.002	80.645	225	S317.001	80.645	225	
S210	82.250	1.527	Open Manhole	1200	S318.000	80.723	225				
S212	83.401	2.783	Open Manhole	1200	S319.000	80.618	300				
S211	83.050	2.857	Open Manhole	1200	S317.003	80.193	300	S317.002	80.267	225	
								S318.000	80.268	225	
								S319.000	80.193	300	
S215	82.349	7.687	Open Manhole	1800	S304.005	74.662	750	S304.004	74.662	750	
								S316.001	75.035	225	
								S317.003	74.960	300	
S679	75.800	1.775	Open Manhole	1800	S304.006	74.025	750	S304.005	74.025	750	
S7	84.250	1.500	Open Manhole	1200	S321.000	82.750	225				
S7A	81.100	1.500	Open Manhole	1200	S321.001	79.600	225	S321.000	79.600	225	
S8	79.650	1.575	Open Manhole	1200	S321.002	78.075	300	S321.001	78.150	225	
S1	84.600	1.700	Open Manhole	1200	S322.000	82.900	225				
S2	82.400	1.500	Open Manhole	1200	S322.001	80.900	225	S322.000	80.900	225	
S3	79.583	1.658	Open Manhole	1200	S322.002	77.925	300	S322.001	78.000	225	
S4	79.591	2.791	Open Manhole	1350	S323.000	76.800	450				
S5	78.728	2.838	Open Manhole	1350	S323.001	75.890	450	S323.000	75.890	450	
S6	78.788	3.079	Open Manhole	1350	S322.003	75.784	450	S322.002	75.709	300	
								S323.001	75.784	450	
S6A	78.175	3.083	Open Manhole	1350	S322.004	75.092	450	S322.003	75.092	450	
S9	78.211	1.611	Open Manhole	1200	S324.000	76.600	225				
S9A	79.508	3.626	Open Manhole	1200	S324.001	75.882	225	S324.000	75.882	225	
S10	79.475	4.046	Open Manhole	1200	S324.002	75.429	300	S324.001	75.503	225	
S651	77.750	2.976	Open Manhole	1350	S322.005	74.774	450	S322.004	74.774	450	
								S324.002	74.924	300	
S11	77.250	2.857	Open Manhole	2100	S321.003	74.393	225	S321.002	74.543	300	
								S322.005	74.393	450	
S50	75.000	0.919	Open Manhole	1350		OUTFALL		S321.003	74.081	225	
			MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)		
			S133A	523471.782	135300.423	523471.782	135300.423	Required			

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Manhole Schedules for Storm

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S133B	523465.418	135315.701	523465.418	135315.701	Required	
S201	523800.037	135253.758	523800.037	135253.758	Required	
S202	523792.436	135278.067	523792.436	135278.067	Required	
S203	523808.667	135260.608	523808.667	135260.608	Required	
S643	523578.282	135409.029	523578.282	135409.029	Required	
S644	523609.568	135419.854	523609.568	135419.854	Required	
S229	523636.271	135425.683	523636.271	135425.683	Required	
S230	523721.008	135335.023	523721.008	135335.023	Required	
S616	523677.329	135368.043	523677.329	135368.043	Required	
S216	523560.375	135103.356	523560.375	135103.356	Required	
S647	523632.954	135138.177			No Entry	
S647	523622.750	135134.036	523622.750	135134.036	Required	
S648	523586.653	135160.593	523586.653	135160.593	Required	
S650	523557.930	135188.642			No Entry	
S649	523552.608	135184.591	523552.608	135184.591	Required	
S217	523537.790	135206.542	523537.790	135206.542	Required	
S218	523517.104	135199.166	523517.104	135199.166	Required	
S220	523489.201	135260.506	523489.201	135260.506	Required	
S656	523514.265	135259.542	523514.265	135259.542	Required	

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Manhole Schedules for Storm

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S221	523511.498	135272.838	523511.498	135272.838	Required	
S222	523589.039	135337.214	523589.039	135337.214	Required	
S659	523583.443	135331.582	523583.443	135331.582	Required	
S223	523581.679	135344.333	523581.679	135344.333	Required	
S224	523598.078	135343.264	523598.078	135343.264	Required	
S225	523595.968	135357.499	523595.968	135357.499	Required	
S227	523616.941	135367.123	523616.941	135367.123	Required	
S663	523648.441	135357.885	523648.441	135357.885	Required	
S231	523648.043	135371.759	523648.043	135371.759	Required	
S600	523657.337	135394.048	523657.337	135394.048	Required	
S595	523647.707	135399.884	523647.707	135399.884	Required	
S232	523646.651	135561.052	523646.651	135561.052	Required	
S233	523647.961	135486.071	523647.961	135486.071	Required	
S234	523647.828	135430.073	523647.828	135430.073	Required	
S207	523676.950	135431.248	523676.950	135431.248	Required	
S214	523788.405	135350.903	523788.405	135350.903	Required	
S215A	523769.214	135360.655	523769.214	135360.655	Required	
S208	523673.795	135221.099	523673.795	135221.099	Required	
S209	523706.590	135272.917	523706.590	135272.917	Required	

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Manhole Schedules for Storm

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S211A	523730.078	135313.651	523730.078	135313.651	Required	
S210	523761.932	135301.513	523761.932	135301.513	Required	
S212	523714.915	135326.569	523714.915	135326.569	Required	
S211	523735.518	135323.086	523735.518	135323.086	Required	
S215	523761.844	135350.380	523761.844	135350.380	Required	
S679	523822.703	135298.017	523822.703	135298.017	Required	
S7	523245.944	135345.392	523245.944	135345.392	Required	
S7A	523310.380	135306.000	523310.380	135306.000	Required	
S8	523338.675	135303.073	523338.675	135303.073	Required	
S1	523243.881	135354.309	523243.881	135354.309	Required	
S2	523270.538	135373.287	523270.538	135373.287	Required	
S3	523332.819	135340.700	523332.819	135340.700	Required	
S4	523335.901	135347.208	523335.901	135347.208	Required	
S5	523398.953	135373.287	523398.953	135373.287	Required	
S6	523404.399	135367.510	523404.399	135367.510	Required	
S6A	523412.628	135346.176	523412.628	135346.176	Required	
S9	523421.235	135427.921	523421.235	135427.921	Required	
S9A	523439.254	135377.178	523439.254	135377.178	Required	
S10	523451.111	135351.334	523451.111	135351.334	Required	

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Manhole Schedules for Storm

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S651	523416.307	135336.383	523416.307	135336.383	Required	
S11	523390.573	135323.727	523390.573	135323.727	Required	
S50	523395.726	135310.199			No Entry	

PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S243.000	o	225	S133A	80.980	79.480	1.275	Open Manhole	1200
S243.001	o	225	S133B	80.550	79.050	1.275	Open Manhole	1200
S301.000	o	225	S201	81.651	80.100	1.326	Open Manhole	1200
S302.000	o	225	S202	81.144	79.719	1.200	Open Manhole	1200
S301.001	o	225	S203	81.419	79.400	1.794	Open Manhole	1200
S304.000	o	375	S643	79.517	77.804	1.338	Open Manhole	1350
S304.001	o	450	S644	80.075	77.288	2.337	Open Manhole	1350
S304.002	o	450	S229	80.673	76.923	3.300	Open Manhole	1350
S305.000	o	225	S230	83.000	80.250	2.525	Open Manhole	1200
S305.001	o	225	S616	82.900	79.090	3.585	Open Manhole	1200
S306.000	o	300	S216	85.230	82.791	2.139	Open Manhole	1200
S307.000	o	150	S647	85.492	85.000	0.342	Sealed Manhole	450
S307.001	o	300	S647	85.474	83.875	1.299	Open Manhole	600
S307.002	o	300	S648	85.090	83.277	1.512	Open Manhole	600
S308.000	o	150	S650	84.735	84.000	0.585	Sealed Manhole	450
S307.003	o	300	S649	84.739	82.722	1.717	Open Manhole	600

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S243.000	16.550	38.5	S133B	80.550	79.050	1.275	Open Manhole	1200
S243.001	32.588	75.0	S133	80.718	78.615	1.878	Open Manhole	1200
S301.000	11.018	15.7	S203	81.419	79.400	1.794	Open Manhole	1200
S302.000	23.838	74.7	S203	81.419	79.400	1.794	Open Manhole	1200
S301.001	22.713	40.0	S205	81.212	78.832	2.155	Open Manhole	1500
S304.000	33.106	75.0	S644	80.075	77.363	2.337	Open Manhole	1350
S304.001	27.332	75.0	S229	80.673	76.923	3.300	Open Manhole	1350
S304.002	12.363	75.0	S234	80.630	76.758	3.422	Open Manhole	1500
S305.000	54.756	47.2	S616	82.900	79.090	3.585	Open Manhole	1200
S305.001	29.521	23.9	S231	81.770	77.855	3.690	Open Manhole	1500
S306.000	105.128	75.0	S218	83.893	81.389	2.204	Open Manhole	1200
S307.000	11.013	11.3	S647	85.474	84.025	1.299	Open Manhole	600
S307.001	44.814	75.0	S648	85.090	83.277	1.512	Open Manhole	600
S307.002	41.653	75.0	S649	84.739	82.722	1.716	Open Manhole	600
S308.000	6.689	5.9	S649	84.739	82.872	1.717	Open Manhole	600
S307.003	26.484	75.0	S217	84.283	82.369	1.614	Open Manhole	1200

PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S307.004	o	300	S217	84.283	82.369	1.614	Open Manhole	1200
S306.001	o	300	S218	83.893	81.389	2.204	Open Manhole	1200
S306.002	o	375	S220	82.119	80.415	1.329	Open Manhole	1350
S309.000	o	150	S656	82.710	80.550	2.010	Open Manhole	1200
S306.003	o	375	S221	82.150	80.075	1.700	Open Manhole	1350
S310.000	o	225	S222	82.105	79.800	2.080	Open Manhole	1200
S311.000	o	225	S659	82.162	79.800	2.137	Open Manhole	1200
S306.004	o	375	S223	81.375	78.692	2.308	Open Manhole	1350
S312.000	o	300	S224	82.060	79.800	1.960	Open Manhole	1200
S306.005	o	450	S225	81.250	78.357	2.443	Open Manhole	1500
S306.006	o	450	S227	81.300	78.049	2.801	Open Manhole	1350
S313.000	o	225	S663	82.381	80.000	2.156	Open Manhole	1200
S305.002	o	600	S231	81.770	77.480	3.690	Open Manhole	1500
S314.000	o	150	S600	81.932	79.650	2.132	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S307.004	21.962	22.4	S218	83.893	81.389	2.204	Open Manhole	1200
S306.001	67.388	75.0	S220	82.119	80.490	1.329	Open Manhole	1350
S306.002	25.480	75.0	S221	82.150	80.075	1.700	Open Manhole	1350
S309.000	13.581	54.3	S221	82.150	80.300	1.700	Open Manhole	1350
S306.003	100.184	72.4	S223	81.375	78.692	2.308	Open Manhole	1350
S310.000	10.239	10.7	S223	81.375	78.842	2.308	Open Manhole	1350
S311.000	12.872	13.4	S223	81.375	78.842	2.308	Open Manhole	1350
S306.004	19.430	74.7	S225	81.250	78.432	2.443	Open Manhole	1500
S312.000	14.390	11.1	S225	81.250	78.507	2.443	Open Manhole	1500
S306.005	23.076	75.0	S227	81.300	78.049	2.801	Open Manhole	1350
S306.006	31.446	75.0	S231	81.770	77.630	3.690	Open Manhole	1500
S313.000	13.880	6.5	S231	81.770	77.855	3.690	Open Manhole	1500
S305.002	28.127	75.0	S595	81.125	77.105	3.420	Open Manhole	1500
S314.000	11.260	5.4	S595	81.125	77.555	3.420	Open Manhole	1500

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PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S305.003	o	600	S595	81.125	77.105	3.420	Open Manhole	1500
S315.000	o	225	S232	83.900	82.475	1.200	Open Manhole	1200
S315.001	o	225	S233	80.100	78.475	1.400	Open Manhole	1200
S304.003	o	600	S234	80.630	76.608	3.422	Open Manhole	1500
S304.004	o	750	S207	81.663	76.220	4.693	Open Manhole	1800
S316.000	o	225	S214	81.635	78.750	2.660	Open Manhole	1200
S316.001	o	225	S215A	81.861	78.250	3.386	Open Manhole	1200
S317.000	o	225	S208	84.978	83.300	1.453	Open Manhole	1200
S317.001	o	225	S209	84.042	82.278	1.539	Open Manhole	1200
S317.002	o	225	S211A	83.223	80.645	2.352	Open Manhole	1200
S318.000	o	225	S210	82.250	80.723	1.302	Open Manhole	1200
S319.000	o	300	S212	83.401	80.618	2.483	Open Manhole	1200
S317.003	o	300	S211	83.050	80.193	2.557	Open Manhole	1200
S304.005	o	750	S215	82.349	74.662	6.937	Open Manhole	1800
S304.006	o	750	S679	75.800	74.025	1.025	Open Manhole	1800

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S305.003	30.189	60.7	S234	80.630	76.608	3.422	Open Manhole	1500
S315.000	74.992	18.7	S233	80.100	78.475	1.400	Open Manhole	1200
S315.001	55.998	75.0	S234	80.630	77.728	2.677	Open Manhole	1500
S304.003	29.146	75.0	S207	81.663	76.220	4.844	Open Manhole	1800
S304.004	117.246	75.3	S215	82.349	74.662	6.937	Open Manhole	1800
S316.000	21.527	43.1	S215A	81.861	78.250	3.386	Open Manhole	1200
S316.001	12.645	3.9	S215	82.349	75.035	7.089	Open Manhole	1800
S317.000	61.325	60.0	S209	84.042	82.278	1.539	Open Manhole	1200
S317.001	47.020	28.8	S211A	83.223	80.645	2.352	Open Manhole	1200
S317.002	10.891	28.8	S211	83.050	80.267	2.558	Open Manhole	1200
S318.000	34.104	75.0	S211	83.050	80.268	2.557	Open Manhole	1200
S319.000	20.896	49.2	S211	83.050	80.193	2.557	Open Manhole	1200
S317.003	37.921	7.2	S215	82.349	74.960	7.089	Open Manhole	1800
S304.005	80.284	126.0	S679	75.800	74.025	1.025	Open Manhole	1800
S304.006	29.489	44.7	S555	75.000	73.365	0.885	Open Manhole	10000

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PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S321.000	o	225	S7	84.250	82.750	1.275	Open Manhole	1200
S321.001	o	225	S7A	81.100	79.600	1.275	Open Manhole	1200
S321.002	o	300	S8	79.650	78.075	1.275	Open Manhole	1200
S322.000	o	225	S1	84.600	82.900	1.475	Open Manhole	1200
S322.001	o	225	S2	82.400	80.900	1.275	Open Manhole	1200
S322.002	o	300	S3	79.583	77.925	1.358	Open Manhole	1200
S323.000	o	450	S4	79.591	76.800	2.341	Open Manhole	1350
S323.001	o	450	S5	78.728	75.890	2.388	Open Manhole	1350
S322.003	o	450	S6	78.788	75.784	2.554	Open Manhole	1350
S322.004	o	450	S6A	78.175	75.092	2.633	Open Manhole	1350
S324.000	o	225	S9	78.211	76.600	1.386	Open Manhole	1200
S324.001	o	225	S9A	79.508	75.882	3.401	Open Manhole	1200
S324.002	o	300	S10	79.475	75.429	3.746	Open Manhole	1200
S322.005	o	450	S651	77.750	74.774	2.526	Open Manhole	1350
S321.003	o	225	S11	77.250	74.393	2.632	Open Manhole	2100

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S321.000	75.523	24.0	S7A	81.100	79.600	1.275	Open Manhole	1200
S321.001	28.446	19.6	S8	79.650	78.150	1.275	Open Manhole	1200
S321.002	55.857	15.8	S11	77.250	74.543	2.407	Open Manhole	2100
S322.000	32.722	16.4	S2	82.400	80.900	1.275	Open Manhole	1200
S322.001	70.291	24.2	S3	79.583	78.000	1.358	Open Manhole	1200
S322.002	76.436	34.5	S6	78.788	75.709	2.779	Open Manhole	1350
S323.000	68.233	75.0	S5	78.728	75.890	2.388	Open Manhole	1350
S323.001	7.940	75.0	S6	78.788	75.784	2.554	Open Manhole	1350
S322.003	22.866	33.0	S6A	78.175	75.092	2.633	Open Manhole	1350
S322.004	10.461	32.9	S651	77.750	74.774	2.526	Open Manhole	1350
S324.000	53.847	75.0	S9A	79.508	75.882	3.401	Open Manhole	1200
S324.001	28.434	75.0	S10	79.475	75.503	3.747	Open Manhole	1200
S324.002	37.879	75.0	S651	77.750	74.924	2.526	Open Manhole	1350
S322.005	28.678	75.3	S11	77.250	74.393	2.407	Open Manhole	2100
S321.003	14.477	46.3	S50	75.000	74.081	0.694	Open Manhole	1350

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Area Summary for Storm

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
243.000	-	-	100	0.000	0.000	0.000
243.001	-	-	100	0.000	0.000	0.000
301.000	User	-	65	0.621	0.404	0.404
302.000	-	-	100	0.000	0.000	0.000
301.001	User	-	100	0.061	0.061	0.061
304.000	-	-	100	0.400	0.400	0.400
304.001	-	-	100	0.200	0.200	0.200
304.002	-	-	100	0.177	0.177	0.177
305.000	User	-	100	0.098	0.098	0.098
305.001	-	-	100	0.000	0.000	0.000
306.000	User	-	100	0.237	0.237	0.237
307.000	User	-	100	0.131	0.131	0.131
307.001	User	-	100	0.138	0.138	0.138
307.002	-	-	100	0.000	0.000	0.000
308.000	User	-	100	0.313	0.313	0.313
307.003	-	-	100	0.000	0.000	0.000
307.004	-	-	100	0.000	0.000	0.000
306.001	-	-	100	0.000	0.000	0.000
306.002	User	-	100	0.174	0.174	0.174
309.000	User	-	65	0.215	0.140	0.140
306.003	User	-	100	0.122	0.122	0.122
310.000	User	-	100	0.066	0.066	0.066
311.000	User	-	65	0.837	0.544	0.544
306.004	User	-	100	0.021	0.021	0.021
312.000	-	-	100	0.000	0.000	0.000
306.005	-	-	100	0.000	0.000	0.000
306.006	User	-	100	0.044	0.044	0.044
313.000	User	-	65	0.400	0.260	0.260
305.002	User	-	100	0.106	0.106	0.106
	User	-	100	0.021	0.021	0.127
314.000	User	-	65	0.237	0.154	0.154
305.003	-	-	100	0.000	0.000	0.000
315.000	User	-	100	0.120	0.120	0.120
315.001	User	-	100	0.061	0.061	0.061
304.003	-	-	100	0.000	0.000	0.000
304.004	-	-	100	0.000	0.000	0.000
316.000	User	-	100	0.277	0.277	0.277
316.001	-	-	100	0.000	0.000	0.000
317.000	User	-	10	0.268	0.027	0.027
317.001	-	-	100	0.000	0.000	0.000
317.002	-	-	100	0.000	0.000	0.000
318.000	User	-	100	0.054	0.054	0.054
319.000	User	-	65	0.640	0.416	0.416
317.003	-	-	100	0.000	0.000	0.000
304.005	-	-	100	0.000	0.000	0.000
304.006	-	-	100	0.000	0.000	0.000
321.000	User	-	90	0.126	0.113	0.113
321.001	-	-	100	0.000	0.000	0.000
321.002	User	-	90	0.107	0.096	0.096
322.000	User	-	70	0.140	0.098	0.098
322.001	User	-	70	0.106	0.074	0.074
322.002	User	-	100	0.023	0.023	0.023
	User	-	70	0.136	0.095	0.118
323.000	-	-	100	0.000	0.000	0.000
323.001	-	-	100	0.000	0.000	0.000
322.003	User	-	70	0.379	0.265	0.265
322.004	-	-	100	0.000	0.000	0.000
324.000	User	-	70	0.148	0.104	0.104
324.001	-	-	100	0.000	0.000	0.000

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Date 19/06/2023 File Kilnwood Drainage Model.mdx	Designed by NB Checked by BSF	
XP Solutions	Network 2020.1	

Area Summary for Storm

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
324.002	-	-	100	0.000	0.000	0.000
322.005	-	-	100	0.000	0.000	0.000
321.003	User	-	90	0.032	0.029	0.029
				Total	Total	Total
				7.235	5.662	5.662

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)
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S321.003	S50	75.000	74.081	0.000	1350	0
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Simulation Criteria for Storm

Volumetric Runoff Coeff	0.840	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	3.000
Hot Start (mins)	0	Inlet Coefficient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1

Number of Input Hydrographs	2	Number of Offline Controls	2	Number of Time/Area Diagrams	0
Number of Online Controls	16	Number of Storage Structures	19	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Winter
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	20.000	Storm Duration (mins)	30
Ratio R	0.349		

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Online Controls for Storm

Hydro-Brake® Optimum Manhole: S11, DS/PN: S321.003, Volume (m³): 18.0

Unit Reference	MD-SHE-0161-1750-2750-1750
Design Head (m)	2.750
Design Flow (l/s)	17.5
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	161
Invert Level (m)	74.393
Minimum Outlet Pipe Diameter (mm)	225
Suggested Manhole Diameter (mm)	1800

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	2.750	17.5	Kick-Flo®	1.445	12.9
Flush-Flo™	0.701	16.4	Mean Flow over Head Range	-	14.7

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)	Depth (m)	Flow (l/s)
0.100	5.8	0.800	16.4	2.000	15.0	4.000	20.9	7.000	27.3
0.200	12.9	1.000	16.0	2.200	15.7	4.500	22.1	7.500	28.3
0.300	14.6	1.200	15.2	2.400	16.4	5.000	23.3	8.000	29.2
0.400	15.6	1.400	13.5	2.600	17.0	5.500	24.4	8.500	30.0
0.500	16.1	1.600	13.5	3.000	18.2	6.000	25.4	9.000	30.9
0.600	16.4	1.800	14.3	3.500	19.6	6.500	26.4	9.500	31.7

Storage Structures for Storm

Tank or Pond Manhole: S11, DS/PN: S321.003

Invert Level (m) 75.900

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	290.0	1.500	290.0	1.501	0.0

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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 3.000
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 2 Number of Offline Controls 2 Number of Time/Area Diagrams 0
Number of Online Controls 16 Number of Storage Structures 19 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 20.000 Cv (Summer) 0.750
Region England and Wales Ratio R 0.349 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0
Analysis Timestep 2.5 Second Increment (Extended)
DTS Status OFF
DVD Status ON
Inertia Status ON

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440
Return Period(s) (years) 1, 2, 30, 100
Climate Change (%) 0, 0, 0, 30

PN	US/MH Name	Event	US/CL (m)	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m ³)	Flow / Cap.	Pipe Flow (l/s)	Status
S243.000	S133A	15 minute 1 year Summer I+0%	80.980	79.480	-0.225	0.000	0.00	0.0	OK
S243.001	S133B	15 minute 1 year Summer I+0%	80.550	79.050	-0.225	0.000	0.00	0.0	OK
S301.000	S201	15 minute 1 year Winter I+0%	81.651	80.211	-0.114	0.000	0.48	53.4	OK
S302.000	S202	15 minute 1 year Summer I+0%	81.144	79.719	-0.225	0.000	0.00	0.0	OK
S301.001	S203	15 minute 1 year Winter I+0%	81.419	79.555	-0.070	0.000	0.80	60.2	OK
S304.000	S643	15 minute 1 year Winter I+0%	79.517	78.062	-0.117	0.000	0.78	51.0	OK
S304.001	S644	15 minute 1 year Winter I+0%	80.075	77.564	-0.173	0.000	0.68	71.8	OK
S304.002	S229	15 minute 1 year Winter I+0%	80.673	77.120	-0.253	0.000	0.39	90.0	OK
S305.000	S230	15 minute 1 year Winter I+0%	83.000	80.314	-0.161	0.000	0.18	12.8	OK
S305.001	S616	15 minute 1 year Winter I+0%	82.900	79.144	-0.171	0.000	0.13	12.9	OK
S306.000	S216	15 minute 1 year Winter I+0%	85.230	82.894	-0.197	0.000	0.24	30.2	OK
S307.000	S647	30 minute 1 year Winter I+0%	85.492	85.041	-0.109	0.000	0.17	8.0	OK
S307.001	S647	15 minute 1 year Winter I+0%	85.474	83.959	-0.216	0.000	0.17	20.9	OK
S307.002	S648	15 minute 1 year Winter I+0%	85.090	83.362	-0.216	0.000	0.17	20.7	OK
S308.000	S650	30 minute 1 year Winter I+0%	84.735	84.056	-0.094	0.000	0.30	19.0	OK
S307.003	S649	30 minute 1 year Winter I+0%	84.739	82.840	-0.182	0.000	0.33	37.7	OK
S307.004	S217	30 minute 1 year Winter I+0%	84.283	82.455	-0.214	0.000	0.18	37.7	OK
S306.001	S218	15 minute 1 year Winter I+0%	83.893	81.544	-0.145	0.000	0.52	63.3	OK
S306.002	S220	15 minute 1 year Winter I+0%	82.119	80.581	-0.209	0.000	0.40	80.6	OK
S309.000	S656	15 minute 1 year Winter I+0%	82.710	80.657	-0.043	0.000	0.83	18.4	OK
S306.003	S221	15 minute 1 year Winter I+0%	82.150	80.260	-0.190	0.000	0.47	106.1	OK
S310.000	S222	15 minute 1 year Winter I+0%	82.105	79.838	-0.187	0.000	0.07	8.8	OK
S311.000	S659	15 minute 1 year Winter I+0%	82.162	79.925	-0.100	0.000	0.59	72.1	OK
S306.004	S223	15 minute 1 year Winter I+0%	81.375	78.979	-0.088	0.000	0.93	179.0	OK
S312.000	S224	15 minute 1 year Summer I+0%	82.060	79.800	-0.300	0.000	0.00	0.0	OK
S306.005	S225	15 minute 1 year Winter I+0%	81.250	78.604	-0.203	0.000	0.58	180.1	OK
S306.006	S227	15 minute 1 year Winter I+0%	81.300	78.293	-0.206	0.000	0.57	184.7	OK
S313.000	S663	15 minute 1 year Winter I+0%	82.381	80.067	-0.158	0.000	0.19	34.6	OK
S305.002	S231	15 minute 1 year Winter I+0%	81.770	77.741	-0.338	0.000	0.39	239.0	OK
S314.000	S600	15 minute 1 year Winter I+0%	81.932	79.706	-0.094	0.000	0.29	20.4	OK

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

PN	US/MH Name	Event	US/CL (m)	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Pipe Flow (l/s)	Status
S305.003	S595	15 minute 1 year Winter I+0%	81.125	77.356	-0.349	0.000	0.36	257.3	OK
S315.000	S232	15 minute 1 year Winter I+0%	83.900	82.530	-0.170	0.000	0.13	15.6	OK
S315.001	S233	15 minute 1 year Winter I+0%	80.100	78.573	-0.127	0.000	0.39	22.8	OK
S304.003	S234	15 minute 1 year Winter I+0%	80.630	76.940	-0.268	0.000	0.59	369.7	OK
S304.004	S207	15 minute 1 year Winter I+0%	81.663	76.489	-0.481	0.000	0.28	364.2	OK
S316.000	S214	15 minute 1 year Winter I+0%	81.635	78.865	-0.110	0.000	0.51	36.7	OK
S316.001	S215A	15 minute 1 year Winter I+0%	81.861	78.311	-0.164	0.000	0.16	36.4	OK
S317.000	S208	15 minute 1 year Winter I+0%	84.978	83.334	-0.191	0.000	0.05	3.5	OK
S317.001	S209	15 minute 1 year Winter I+0%	84.042	82.306	-0.197	0.000	0.04	3.5	OK
S317.002	S211A	15 minute 1 year Winter I+0%	83.223	80.675	-0.195	0.000	0.04	3.5	OK
S318.000	S210	15 minute 1 year Winter I+0%	82.250	80.776	-0.172	0.000	0.12	7.0	OK
S319.000	S212	15 minute 1 year Winter I+0%	83.401	80.750	-0.168	0.000	0.40	55.1	OK
S317.003	S211	15 minute 1 year Winter I+0%	83.050	80.277	-0.216	0.000	0.17	64.9	OK
S304.005	S215	15 minute 1 year Winter I+0%	82.349	75.015	-0.397	0.000	0.45	440.3	OK
S304.006	S679	15 minute 1 year Winter I+0%	75.800	74.328	-0.447	0.000	0.35	439.2	OK
S321.000	S7	15 minute 1 year Winter I+0%	84.250	82.807	-0.168	0.000	0.14	14.8	OK
S321.001	S7A	15 minute 1 year Winter I+0%	81.100	79.655	-0.170	0.000	0.14	14.9	OK
S321.002	S8	15 minute 1 year Winter I+0%	79.650	78.138	-0.237	0.000	0.10	25.6	OK
S322.000	S1	15 minute 1 year Winter I+0%	84.600	82.949	-0.176	0.000	0.11	13.0	OK
S322.001	S2	15 minute 1 year Winter I+0%	82.400	80.970	-0.155	0.000	0.21	21.3	OK
S322.002	S3	15 minute 1 year Winter I+0%	79.583	78.014	-0.211	0.000	0.19	34.5	OK
S323.000	S4	15 minute 1 year Summer I+0%	79.591	76.800	-0.450	0.000	0.00	0.0	OK
S323.001	S5	30 minute 1 year Winter I+0%	78.728	76.148	-0.192	0.000	0.02	3.9	OK
S322.003	S6	30 minute 1 year Winter I+0%	78.788	76.148	-0.086	0.000	0.11	51.1	OK
S322.004	S6A	30 minute 1 year Winter I+0%	78.175	76.110	0.569	0.000	0.12	36.9	SURCHARGED
S324.000	S9	15 minute 1 year Winter I+0%	78.211	76.675	-0.150	0.000	0.23	13.5	OK
S324.001	S9A	30 minute 1 year Winter I+0%	79.508	76.094	-0.013	0.000	0.19	10.7	OK
S324.002	S10	30 minute 1 year Winter I+0%	79.475	76.080	0.351	0.000	0.07	8.4	SURCHARGED
S322.005	S651	30 minute 1 year Winter I+0%	77.750	76.074	0.850	0.000	0.14	43.5	SURCHARGED
S321.003	S11	60 minute 1 year Winter I+0%	77.250	75.994	1.376	0.000	0.24	16.4	SURCHARGED

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XP Solutions	Network 2020.1	

2 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 3.000
 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 2 Number of Offline Controls 2 Number of Time/Area Diagrams 0
 Number of Online Controls 16 Number of Storage Structures 19 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 20.000 Cv (Summer) 0.750
 Region England and Wales Ratio R 0.349 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0
 Analysis Timestep 2.5 Second Increment (Extended)
 DTS Status OFF
 DVD Status ON
 Inertia Status ON

Profile(s) Summer and Winter
 Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440
 Return Period(s) (years) 1, 2, 30, 100
 Climate Change (%) 0, 0, 0, 30

PN	US/MH Name	Event	US/CL (m)	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Pipe Flow (l/s)	Status
S243.000	S133A	15 minute 2 year Summer I+0%	80.980	79.480	-0.225	0.000	0.00	0.0	OK
S243.001	S133B	15 minute 2 year Summer I+0%	80.550	79.050	-0.225	0.000	0.00	0.0	OK
S301.000	S201	15 minute 2 year Winter I+0%	81.651	80.230	-0.095	0.000	0.62	69.0	OK
S302.000	S202	15 minute 2 year Summer I+0%	81.144	79.719	-0.225	0.000	0.00	0.0	OK
S301.001	S203	15 minute 2 year Winter I+0%	81.419	79.623	-0.002	0.000	1.00	75.7	OK
S304.000	S643	15 minute 2 year Winter I+0%	79.517	78.131	-0.048	0.000	0.99	64.4	OK
S304.001	S644	15 minute 2 year Winter I+0%	80.075	77.615	-0.123	0.000	0.87	91.2	OK
S304.002	S229	15 minute 2 year Winter I+0%	80.673	77.150	-0.223	0.000	0.50	114.5	OK
S305.000	S230	15 minute 2 year Winter I+0%	83.000	80.324	-0.151	0.000	0.23	16.6	OK
S305.001	S616	15 minute 2 year Winter I+0%	82.900	79.152	-0.163	0.000	0.17	16.7	OK
S306.000	S216	15 minute 2 year Winter I+0%	85.230	82.910	-0.181	0.000	0.31	39.1	OK
S307.000	S647	30 minute 2 year Winter I+0%	85.492	85.047	-0.103	0.000	0.21	10.2	OK
S307.001	S647	15 minute 2 year Winter I+0%	85.474	83.972	-0.203	0.000	0.23	27.1	OK
S307.002	S648	15 minute 2 year Winter I+0%	85.090	83.374	-0.204	0.000	0.22	26.8	OK
S308.000	S650	30 minute 2 year Winter I+0%	84.735	84.065	-0.085	0.000	0.39	24.4	OK
S307.003	S649	30 minute 2 year Winter I+0%	84.739	82.857	-0.165	0.000	0.42	48.5	OK
S307.004	S217	30 minute 2 year Winter I+0%	84.283	82.467	-0.202	0.000	0.23	48.5	OK
S306.001	S218	15 minute 2 year Winter I+0%	83.893	81.571	-0.118	0.000	0.67	82.1	OK
S306.002	S220	15 minute 2 year Winter I+0%	82.119	80.608	-0.182	0.000	0.52	104.6	OK
S309.000	S656	15 minute 2 year Winter I+0%	82.710	80.717	0.017	0.000	1.04	23.1	SURCHARGED
S306.003	S221	15 minute 2 year Winter I+0%	82.150	80.292	-0.158	0.000	0.61	138.8	OK
S310.000	S222	15 minute 2 year Winter I+0%	82.105	79.844	-0.181	0.000	0.08	11.4	OK
S311.000	S659	15 minute 2 year Winter I+0%	82.162	79.949	-0.076	0.000	0.76	93.2	OK
S306.004	S223	15 minute 2 year Winter I+0%	81.375	79.171	0.104	0.000	1.20	232.2	SURCHARGED
S312.000	S224	15 minute 2 year Summer I+0%	82.060	79.800	-0.300	0.000	0.00	0.0	OK
S306.005	S225	15 minute 2 year Winter I+0%	81.250	78.649	-0.158	0.000	0.75	231.0	OK
S306.006	S227	15 minute 2 year Winter I+0%	81.300	78.339	-0.160	0.000	0.73	236.0	OK
S313.000	S663	15 minute 2 year Winter I+0%	82.381	80.076	-0.149	0.000	0.25	44.8	OK
S305.002	S231	15 minute 2 year Winter I+0%	81.770	77.779	-0.301	0.000	0.49	301.3	OK
S314.000	S600	15 minute 2 year Winter I+0%	81.932	79.714	-0.086	0.000	0.38	26.4	OK

2 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Event	US/CL (m)	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Pipe Flow (l/s)	Status
S305.003	S595	15 minute 2 year Winter I+0%	81.125	77.390	-0.315	0.000	0.46	321.7	OK
S315.000	S232	15 minute 2 year Winter I+0%	83.900	82.539	-0.161	0.000	0.17	20.2	OK
S315.001	S233	15 minute 2 year Winter I+0%	80.100	78.589	-0.111	0.000	0.51	29.5	OK
S304.003	S234	15 minute 2 year Winter I+0%	80.630	76.995	-0.213	0.000	0.74	461.1	OK
S304.004	S207	15 minute 2 year Winter I+0%	81.663	76.527	-0.443	0.000	0.35	460.7	OK
S316.000	S214	15 minute 2 year Winter I+0%	81.635	78.885	-0.090	0.000	0.66	47.5	OK
S316.001	S215A	15 minute 2 year Winter I+0%	81.861	78.320	-0.155	0.000	0.21	47.1	OK
S317.000	S208	15 minute 2 year Winter I+0%	84.978	83.339	-0.186	0.000	0.07	4.5	OK
S317.001	S209	15 minute 2 year Winter I+0%	84.042	82.310	-0.193	0.000	0.05	4.5	OK
S317.002	S211A	15 minute 2 year Winter I+0%	83.223	80.679	-0.191	0.000	0.05	4.5	OK
S318.000	S210	15 minute 2 year Winter I+0%	82.250	80.784	-0.164	0.000	0.16	9.1	OK
S319.000	S212	15 minute 2 year Winter I+0%	83.401	80.772	-0.146	0.000	0.51	71.3	OK
S317.003	S211	15 minute 2 year Winter I+0%	83.050	80.289	-0.204	0.000	0.22	83.8	OK
S304.005	S215	15 minute 2 year Winter I+0%	82.349	75.067	-0.345	0.000	0.57	556.3	OK
S304.006	S679	15 minute 2 year Winter I+0%	75.800	74.371	-0.404	0.000	0.44	555.0	OK
S321.000	S7	15 minute 2 year Winter I+0%	84.250	82.816	-0.159	0.000	0.18	19.1	OK
S321.001	S7A	15 minute 2 year Winter I+0%	81.100	79.664	-0.161	0.000	0.18	19.2	OK
S321.002	S8	15 minute 2 year Winter I+0%	79.650	78.146	-0.229	0.000	0.12	33.2	OK
S322.000	S1	15 minute 2 year Winter I+0%	84.600	82.956	-0.169	0.000	0.14	16.9	OK
S322.001	S2	15 minute 2 year Winter I+0%	82.400	80.980	-0.145	0.000	0.27	27.4	OK
S322.002	S3	15 minute 2 year Winter I+0%	79.583	78.026	-0.199	0.000	0.24	44.5	OK
S323.000	S4	15 minute 2 year Summer I+0%	79.591	76.800	-0.450	0.000	0.00	0.0	OK
S323.001	S5	30 minute 2 year Winter I+0%	78.728	76.406	0.066	0.000	0.05	10.0	SURCHARGED
S322.003	S6	30 minute 2 year Winter I+0%	78.788	76.406	0.172	0.000	0.13	59.1	SURCHARGED
S322.004	S6A	30 minute 2 year Winter I+0%	78.175	76.311	0.769	0.000	0.14	45.2	SURCHARGED
S324.000	S9	15 minute 2 year Winter I+0%	78.211	76.686	-0.139	0.000	0.30	17.5	OK
S324.001	S9A	30 minute 2 year Winter I+0%	79.508	76.198	0.091	0.000	0.21	11.7	SURCHARGED
S324.002	S10	30 minute 2 year Winter I+0%	79.475	76.181	0.452	0.000	0.08	10.1	SURCHARGED
S322.005	S651	30 minute 2 year Winter I+0%	77.750	76.171	0.947	0.000	0.17	53.8	SURCHARGED
S321.003	S11	60 minute 2 year Winter I+0%	77.250	76.065	1.447	0.000	0.24	16.4	SURCHARGED

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Raven House 29 Linkfield Lane Surrey RH1 1SS	Remaining Infrastructure Kilnwood Vale Foul Water Calculations	
Date 19/06/2023 File Kilnwood Drainage Model.mdx	Designed by NB Checked by BSF	
XP Solutions	Network 2020.1	

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 3.000
 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 2 Number of Offline Controls 2 Number of Time/Area Diagrams 0
 Number of Online Controls 16 Number of Storage Structures 19 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 20.000 Cv (Summer) 0.750
 Region England and Wales Ratio R 0.349 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0
 Analysis Timestep 2.5 Second Increment (Extended)
 DTS Status OFF
 DVD Status ON
 Inertia Status ON

Profile(s) Summer and Winter
 Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440
 Return Period(s) (years) 1, 2, 30, 100
 Climate Change (%) 0, 0, 0, 30

PN	US/MH Name	Event	US/CL (m)	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m ³)	Flow / Cap.	Pipe Flow (l/s)	Status
S243.000	S133A	15 minute 30 year Summer I+0%	80.980	79.480	-0.225	0.000	0.00	0.0	OK
S243.001	S133B	15 minute 30 year Summer I+0%	80.550	79.050	-0.225	0.000	0.00	0.0	OK
S301.000	S201	15 minute 30 year Winter I+0%	81.651	80.948	0.623	0.000	0.92	102.1	SURCHARGED
S302.000	S202	15 minute 30 year Winter I+0%	81.144	80.357	0.413	0.000	0.08	4.5	SURCHARGED
S301.001	S203	15 minute 30 year Winter I+0%	81.419	80.358	0.733	0.000	1.51	113.8	SURCHARGED
S304.000	S643	15 minute 30 year Winter I+0%	79.517	79.114	0.935	0.000	1.48	96.6	SURCHARGED
S304.001	S644	15 minute 30 year Winter I+0%	80.075	78.132	0.394	0.000	1.30	137.2	SURCHARGED
S304.002	S229	15 minute 30 year Winter I+0%	80.673	77.493	0.120	0.000	0.77	176.9	SURCHARGED
S305.000	S230	15 minute 30 year Winter I+0%	83.000	80.355	-0.120	0.000	0.43	31.4	OK
S305.001	S616	15 minute 30 year Winter I+0%	82.900	79.178	-0.137	0.000	0.32	31.7	OK
S306.000	S216	15 minute 30 year Winter I+0%	85.230	82.964	-0.127	0.000	0.59	74.2	OK
S307.000	S647	30 minute 30 year Winter I+0%	85.492	85.066	-0.084	0.000	0.41	19.5	OK
S307.001	S647	15 minute 30 year Winter I+0%	85.474	84.027	-0.148	0.000	0.50	59.9	OK
S307.002	S648	15 minute 30 year Winter I+0%	85.090	83.429	-0.148	0.000	0.50	59.4	OK
S308.000	S650	30 minute 30 year Winter I+0%	84.735	84.097	-0.053	0.000	0.75	46.6	OK
S307.003	S649	15 minute 30 year Winter I+0%	84.739	82.927	-0.095	0.000	0.81	93.0	OK
S307.004	S217	15 minute 30 year Winter I+0%	84.283	82.535	-0.134	0.000	0.45	92.4	OK
S306.001	S218	15 minute 30 year Winter I+0%	83.893	82.380	0.691	0.000	1.13	138.8	SURCHARGED
S306.002	S220	15 minute 30 year Winter I+0%	82.119	81.229	0.439	0.000	0.84	167.4	SURCHARGED
S309.000	S656	15 minute 30 year Winter I+0%	82.710	81.532	0.832	0.000	1.53	33.9	SURCHARGED
S306.003	S221	15 minute 30 year Winter I+0%	82.150	81.009	0.559	0.000	0.92	208.5	SURCHARGED
S310.000	S222	15 minute 30 year Winter I+0%	82.105	79.860	-0.165	0.000	0.16	21.6	OK
S311.000	S659	15 minute 30 year Winter I+0%	82.162	81.005	0.980	0.000	1.13	139.3	SURCHARGED
S306.004	S223	15 minute 30 year Winter I+0%	81.375	79.841	0.774	0.000	1.82	352.3	SURCHARGED
S312.000	S224	15 minute 30 year Summer I+0%	82.060	79.800	-0.300	0.000	0.00	0.0	OK
S306.005	S225	15 minute 30 year Winter I+0%	81.250	78.979	0.172	0.000	1.14	352.5	SURCHARGED
S306.006	S227	15 minute 30 year Winter I+0%	81.300	78.578	0.079	0.000	1.11	358.4	SURCHARGED
S313.000	S663	15 minute 30 year Winter I+0%	82.381	80.110	-0.115	0.000	0.47	84.9	OK
S305.002	S231	15 minute 30 year Winter I+0%	81.770	77.884	-0.195	0.000	0.78	476.9	OK
S314.000	S600	15 minute 30 year Winter I+0%	81.932	79.745	-0.055	0.000	0.72	50.1	OK

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Event	US/CL (m)	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Pipe Flow (l/s)	Status
S305.003	S595	15 minute 30 year Winter I+0%	81.125	77.606	-0.099	0.000	0.72	508.9	OK
S315.000	S232	15 minute 30 year Winter I+0%	83.900	82.565	-0.135	0.000	0.33	38.3	OK
S315.001	S233	15 minute 30 year Winter I+0%	80.100	78.692	-0.008	0.000	1.00	57.9	OK
S304.003	S234	15 minute 30 year Winter I+0%	80.630	77.355	0.147	0.000	1.19	744.1	SURCHARGED
S304.004	S207	15 minute 30 year Winter I+0%	81.663	76.624	-0.346	0.000	0.56	739.2	OK
S316.000	S214	15 minute 30 year Winter I+0%	81.635	79.196	0.221	0.000	1.20	86.9	SURCHARGED
S316.001	S215A	15 minute 30 year Winter I+0%	81.861	78.346	-0.129	0.000	0.38	86.6	OK
S317.000	S208	15 minute 30 year Winter I+0%	84.978	83.355	-0.170	0.000	0.13	8.5	OK
S317.001	S209	15 minute 30 year Winter I+0%	84.042	82.324	-0.179	0.000	0.09	8.6	OK
S317.002	S211A	15 minute 30 year Winter I+0%	83.223	80.693	-0.177	0.000	0.10	8.5	OK
S318.000	S210	15 minute 30 year Winter I+0%	82.250	80.809	-0.139	0.000	0.30	17.1	OK
S319.000	S212	15 minute 30 year Winter I+0%	83.401	80.856	-0.062	0.000	0.97	135.2	OK
S317.003	S211	15 minute 30 year Winter I+0%	83.050	80.329	-0.164	0.000	0.41	159.0	OK
S304.005	S215	15 minute 30 year Winter I+0%	82.349	75.244	-0.168	0.000	0.95	935.9	OK
S304.006	S679	60 minute 30 year Winter I+0%	75.800	75.074	0.299	0.000	0.52	659.7	SURCHARGED
S321.000	S7	15 minute 30 year Winter I+0%	84.250	82.843	-0.132	0.000	0.35	36.1	OK
S321.001	S7A	15 minute 30 year Winter I+0%	81.100	79.690	-0.135	0.000	0.33	36.4	OK
S321.002	S8	15 minute 30 year Winter I+0%	79.650	78.180	-0.195	0.000	0.26	68.4	OK
S322.000	S1	15 minute 30 year Winter I+0%	84.600	82.979	-0.146	0.000	0.26	32.0	OK
S322.001	S2	15 minute 30 year Winter I+0%	82.400	81.021	-0.104	0.000	0.55	56.7	OK
S322.002	S3	15 minute 30 year Winter I+0%	79.583	78.083	-0.142	0.000	0.52	94.9	OK
S323.000	S4	15 minute 30 year Winter I+0%	79.591	76.824	-0.426	0.000	0.00	0.2	OK
S323.001	S5	30 minute 30 year Summer I+0%	78.728	76.822	0.482	0.000	0.10	18.4	SURCHARGED
S322.003	S6	15 minute 30 year Winter I+0%	78.788	76.825	0.591	0.000	0.38	179.1	SURCHARGED
S322.004	S6A	60 minute 30 year Winter I+0%	78.175	76.644	1.102	0.000	0.30	95.0	SURCHARGED
S324.000	S9	15 minute 30 year Winter I+0%	78.211	76.725	-0.100	0.000	0.57	33.1	OK
S324.001	S9A	60 minute 30 year Winter I+0%	79.508	76.518	0.411	0.000	0.30	16.9	SURCHARGED
S324.002	S10	60 minute 30 year Winter I+0%	79.475	76.503	0.774	0.000	0.14	16.5	SURCHARGED
S322.005	S651	60 minute 30 year Winter I+0%	77.750	76.494	1.270	0.000	0.35	110.8	SURCHARGED
S321.003	S11	120 minute 30 year Winter I+0%	77.250	76.413	1.795	0.000	0.24	16.4	SURCHARGED

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Raven House 29 Linkfield Lane Surrey RH1 1SS	Remaining Infrastructure Kilnwood Vale Foul Water Calculations	
Date 19/06/2023 File Kilnwood Drainage Model.mdx	Designed by NB Checked by BSF	
XP Solutions	Network 2020.1	

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 3.000
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 2 Number of Offline Controls 2 Number of Time/Area Diagrams 0
Number of Online Controls 16 Number of Storage Structures 19 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 20.000 Cv (Summer) 0.750
Region England and Wales Ratio R 0.349 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0
Analysis Timestep 2.5 Second Increment (Extended)
DTS Status OFF
DVD Status ON
Inertia Status ON

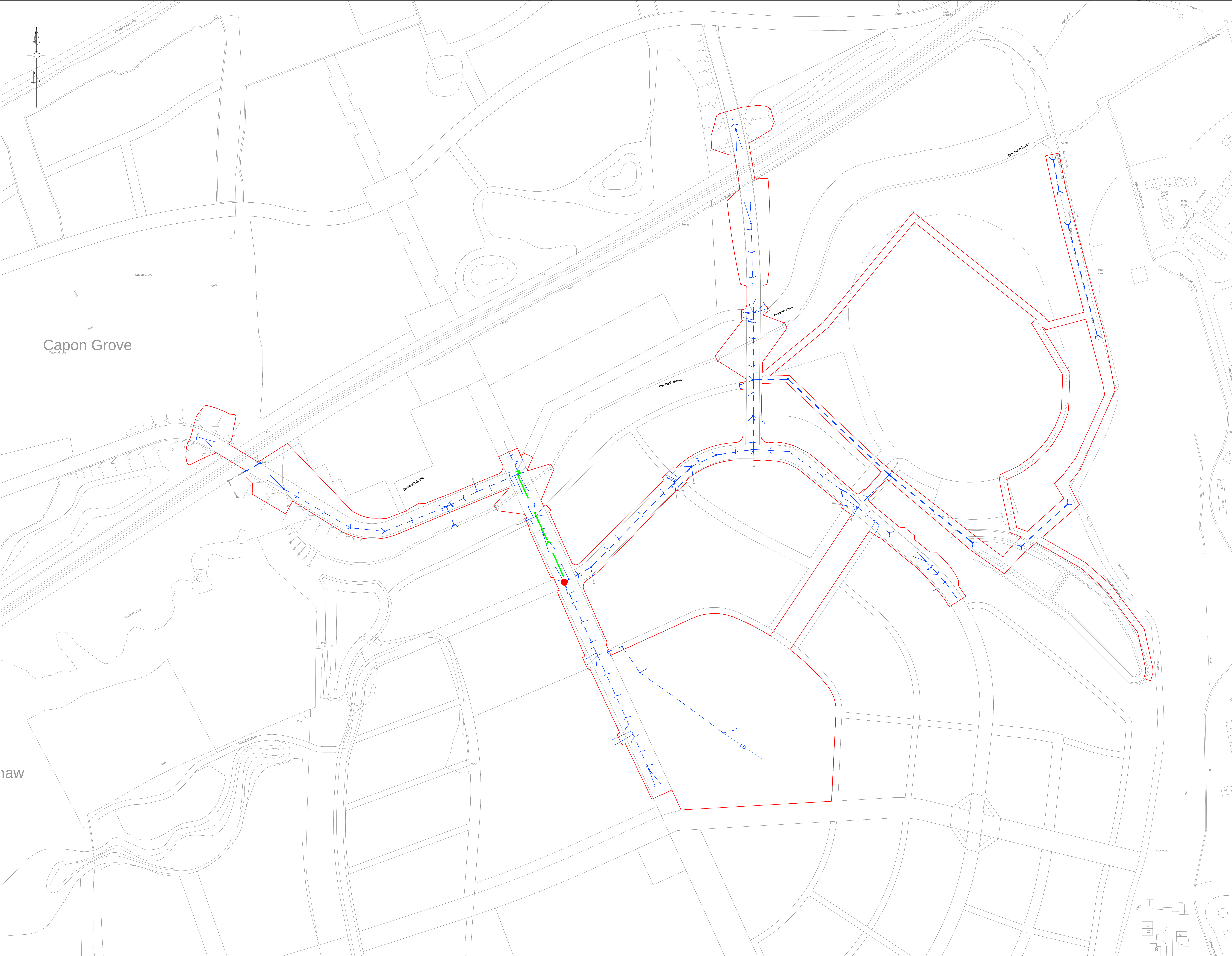
Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440
Return Period(s) (years) 1, 2, 30, 100
Climate Change (%) 0, 0, 0, 30

PN	US/MH Name	Event	US/CL (m)	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Pipe Flow (l/s)	Status
S243.000	S133A	15 minute 100 year Summer I+30%	80.980	79.480	-0.225	0.000	0.00	0.0	OK
S243.001	S133B	15 minute 100 year Summer I+30%	80.550	79.050	-0.225	0.000	0.00	0.0	OK
S301.000	S201	15 minute 100 year Winter I+30%	81.651	81.667	1.342	16.284	1.14	126.5	FLOOD
S302.000	S202	15 minute 100 year Winter I+30%	81.144	81.007	1.063	0.000	0.12	6.6	FLOOD RISK
S301.001	S203	15 minute 100 year Winter I+30%	81.419	81.012	1.387	0.000	1.85	139.5	SURCHARGED
S304.000	S643	15 minute 100 year Winter I+30%	79.517	79.545	1.366	27.957	1.88	122.1	FLOOD
S304.001	S644	15 minute 100 year Winter I+30%	80.075	79.096	1.358	0.000	1.70	178.6	SURCHARGED
S304.002	S229	15 minute 100 year Winter I+30%	80.673	78.084	0.711	0.000	1.15	264.0	SURCHARGED
S305.000	S230	15 minute 100 year Winter I+30%	83.000	80.396	-0.079	0.000	0.73	52.9	OK
S305.001	S616	15 minute 100 year Winter I+30%	82.900	79.209	-0.106	0.000	0.54	53.4	OK
S306.000	S216	15 minute 100 year Winter I+30%	85.230	84.538	1.447	0.000	0.77	96.2	SURCHARGED
S307.000	S647	30 minute 100 year Winter I+30%	85.492	85.157	0.007	0.000	0.78	37.1	SURCHARGED*
S307.001	S647	30 minute 100 year Winter I+30%	85.474	84.762	0.587	0.000	0.70	84.5	SURCHARGED
S307.002	S648	30 minute 100 year Winter I+30%	85.090	84.600	1.022	0.000	0.67	80.7	SURCHARGED
S308.000	S650	30 minute 100 year Summer I+30%	84.735	84.735	0.585	0.000	1.24	77.4	FLOOD RISK*
S307.003	S649	30 minute 100 year Winter I+30%	84.739	84.437	1.415	0.000	1.11	128.2	SURCHARGED
S307.004	S217	30 minute 100 year Winter I+30%	84.283	84.170	1.501	0.000	0.67	139.1	FLOOD RISK
S306.001	S218	30 minute 100 year Winter I+30%	83.893	83.880	2.191	0.000	1.39	170.3	FLOOD RISK
S306.002	S220	30 minute 100 year Winter I+30%	82.119	82.145	1.355	25.745	1.25	251.5	FLOOD
S309.000	S656	15 minute 100 year Winter I+30%	82.710	82.714	2.014	4.175	1.84	40.8	FLOOD
S306.003	S221	15 minute 100 year Summer I+30%	82.150	82.083	1.633	0.000	1.07	241.4	FLOOD RISK
S310.000	S222	15 minute 100 year Winter I+30%	82.105	81.052	1.027	0.000	0.24	32.7	SURCHARGED
S311.000	S659	15 minute 100 year Winter I+30%	82.162	82.182	2.157	20.224	1.43	175.6	FLOOD
S306.004	S223	15 minute 100 year Winter I+30%	81.375	80.989	1.922	0.000	2.10	405.6	SURCHARGED
S312.000	S224	15 minute 100 year Winter I+30%	82.060	79.862	-0.238	0.000	0.01	1.5	OK
S306.005	S225	15 minute 100 year Winter I+30%	81.250	79.917	1.110	0.000	1.32	408.0	SURCHARGED
S306.006	S227	15 minute 100 year Winter I+30%	81.300	79.432	0.933	0.000	1.29	416.0	SURCHARGED
S313.000	S663	15 minute 100 year Winter I+30%	82.381	80.154	-0.071	0.000	0.80	143.0	OK
S305.002	S231	15 minute 100 year Winter I+30%	81.770	78.771	0.691	0.000	1.02	624.3	SURCHARGED
S314.000	S600	15 minute 100 year Winter I+30%	81.932	80.436	0.636	0.000	1.00	69.4	SURCHARGED

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Event	US/CL (m)	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Pipe Flow (l/s)	Status
S305.003	S595	15 minute 100 year Winter	I+30% 81.125	78.359	0.654	0.000	0.98	694.3	SURCHARGED
S315.000	S232	15 minute 100 year Winter	I+30% 83.900	82.597	-0.103	0.000	0.55	64.7	OK
S315.001	S233	15 minute 100 year Winter	I+30% 80.100	79.772	1.072	0.000	1.54	89.2	SURCHARGED
S304.003	S234	15 minute 100 year Winter	I+30% 80.630	77.869	0.661	0.000	1.65	1031.0	SURCHARGED
S304.004	S207	30 minute 100 year Winter	I+30% 81.663	76.998	0.028	0.000	0.71	938.8	SURCHARGED
S316.000	S214	15 minute 100 year Winter	I+30% 81.635	80.358	1.383	0.000	1.91	138.1	SURCHARGED
S316.001	S215A	15 minute 100 year Winter	I+30% 81.861	78.378	-0.097	0.000	0.61	138.8	OK
S317.000	S208	15 minute 100 year Winter	I+30% 84.978	83.373	-0.152	0.000	0.22	14.4	OK
S317.001	S209	15 minute 100 year Winter	I+30% 84.042	82.337	-0.166	0.000	0.15	14.4	OK
S317.002	S211A	15 minute 100 year Winter	I+30% 83.223	80.708	-0.162	0.000	0.18	14.4	OK
S318.000	S210	15 minute 100 year Winter	I+30% 82.250	80.839	-0.109	0.000	0.51	28.8	OK
S319.000	S212	15 minute 100 year Winter	I+30% 83.401	81.590	0.672	0.000	1.60	222.5	SURCHARGED
S317.003	S211	15 minute 100 year Winter	I+30% 83.050	80.377	-0.116	0.000	0.69	265.2	OK
S304.005	S215	30 minute 100 year Winter	I+30% 82.349	76.334	0.922	0.000	1.15	1127.5	SURCHARGED
S304.006	S679	60 minute 100 year Winter	I+30% 75.800	75.733	0.958	0.000	0.76	969.0	FLOOD RISK
S321.000	S7	15 minute 100 year Winter	I+30% 84.250	82.877	-0.098	0.000	0.59	60.9	OK
S321.001	S7A	15 minute 100 year Winter	I+30% 81.100	79.722	-0.103	0.000	0.56	61.3	OK
S321.002	S8	15 minute 100 year Winter	I+30% 79.650	78.215	-0.160	0.000	0.43	115.3	OK
S322.000	S1	15 minute 100 year Winter	I+30% 84.600	83.006	-0.119	0.000	0.44	53.9	OK
S322.001	S2	15 minute 100 year Winter	I+30% 82.400	81.089	-0.036	0.000	0.92	95.2	OK
S322.002	S3	15 minute 100 year Winter	I+30% 79.583	78.584	0.359	0.000	0.83	151.1	SURCHARGED
S323.000	S4	120 minute 100 year Winter	I+30% 79.591	77.343	0.093	0.000	0.00	0.9	SURCHARGED
S323.001	S5	120 minute 100 year Winter	I+30% 78.728	77.343	1.003	0.000	0.02	3.7	SURCHARGED
S322.003	S6	120 minute 100 year Winter	I+30% 78.788	77.343	1.109	0.000	0.21	98.0	SURCHARGED
S322.004	S6A	120 minute 100 year Winter	I+30% 78.175	77.204	1.662	0.000	0.31	97.4	SURCHARGED
S324.000	S9	15 minute 100 year Winter	I+30% 78.211	77.368	0.543	0.000	0.78	44.9	SURCHARGED
S324.001	S9A	120 minute 100 year Winter	I+30% 79.508	77.094	0.987	0.000	0.31	17.6	SURCHARGED
S324.002	S10	120 minute 100 year Winter	I+30% 79.475	77.077	1.348	0.000	0.14	17.0	SURCHARGED
S322.005	S651	120 minute 100 year Winter	I+30% 77.750	77.068	1.844	0.000	0.36	113.6	SURCHARGED
S321.003	S11	180 minute 100 year Winter	I+30% 77.250	77.024	2.406	0.000	0.26	17.1	FLOOD RISK

*Remaining Infrastructure;
Flood Routing Plan*



NOTES

1 DO NOT SCALE THIS DRAWING ON PRINT OR ELECTRONICALLY. WORK FROM FIGURED DIMENSIONS ONLY.

2 No deviation from the details shown on this drawing is allowed without CampbellReith's prior permission in writing.

3 Read this drawing with all Architects, Service Engineers and CampbellReith's relevant details and drawings. NB: Set-out dimensions as per the Architects' drawings take precedence.

4 All work is to be in accordance with the relevant specifications issued by CampbellReith, British Standard Codes of Practice, Statutory requirements and the Contract Documents.

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6 SUITABILITY CODE

WORK IN PROGRESS:

S0 - Work in progress

SHARED (NON-CONTRACTUAL):

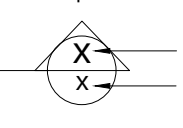
S1 - For coordination, **S2** - For information, **S3** - For internal review and comment, **S4** - For construction approval.

DOCUMENTATION (FOR CONTRACTOR PURPOSES):

D1 - For costing, **D2** - For Tender, **D3** - For contractor design, **D4** - For manufacturer / procurement.

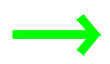
CONSTRUCTION:

A - For construction, **B** - For construction but with comments (i.e. areas in abeyance), **C** - Comprehensive revisions required.

7  Denotes Section Number.
Denotes Drawing Number

8. This drawing is to be read in conjunction with others in the CampbellReith 11550-R1 series.

9. All adoptable highway works to be carried out in accordance with DfT specification for highway works or as amended by West Sussex County Council S276/98 standard details.

- Legend**
-  Direction of overland flow
 -  Flooded highway manhole

P2	BOUNDARY UPDATED	19.02.20	MJB
P1	ISSUED FOR INFORMATION	14.02.20	MJB
Issued by	Description	Date	By

CampbellReith
consulting engineers

LONDON 020 7340 1700 ☐ MANCHESTER 0161 819 3060
SURREY 01737 784 500 ☐ BIRMINGHAM 01675 467 484
BRISTOL 0117 916 1066 ☐ DUBAI 00 971 4345 7088
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Job Title
KILNWOOD VALE, CRAWLEY

Client
CREST NICHOLSON

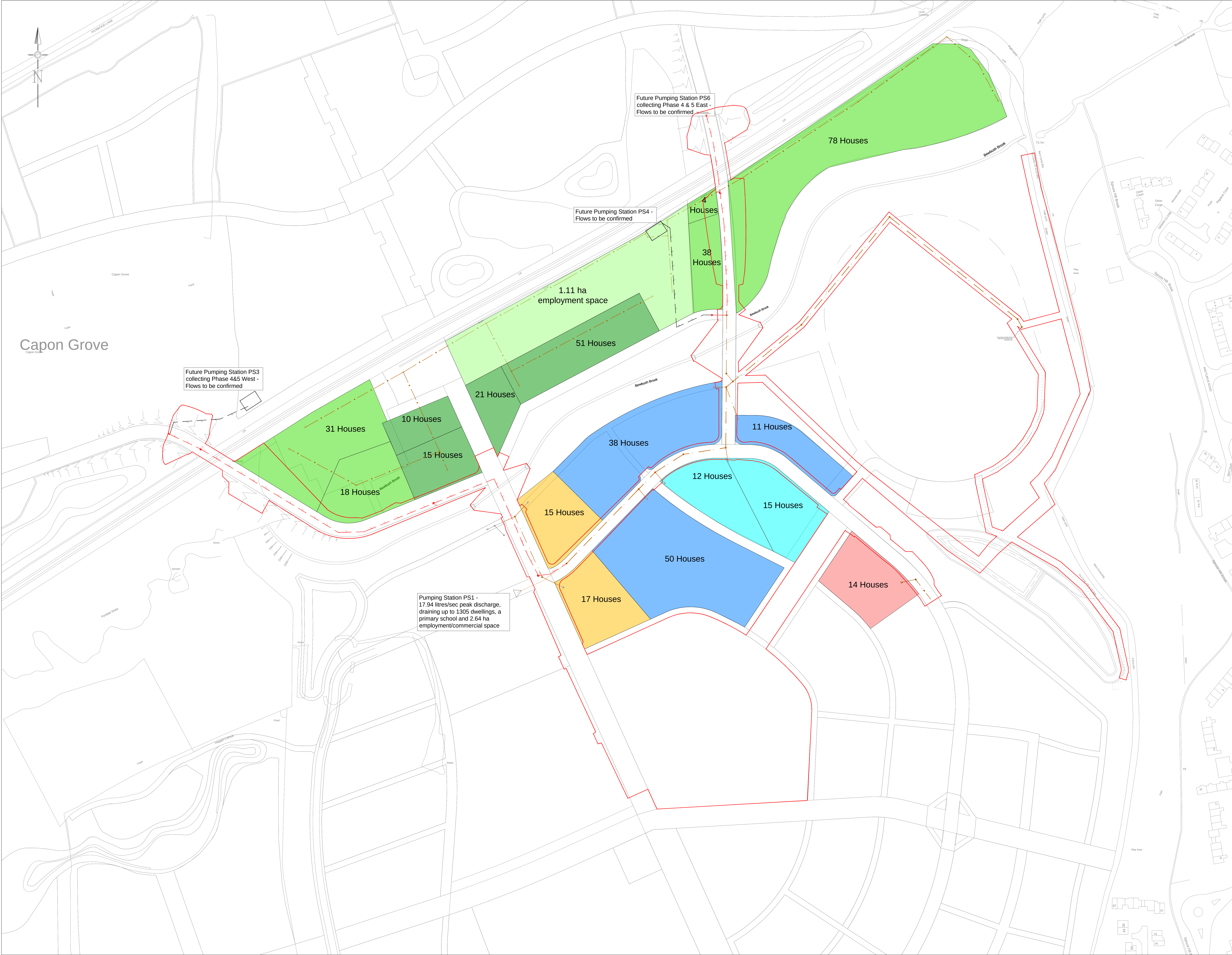
**PHASE 2 & 3 REMAINING
INFRASTRUCTURE
EXCEEDANCE FLOOD ROUTES**

drawn	date	scale @ A0	C1 checked	CR Project No.
MJB	13.02.20	1:1000	-	11950

Dwg No.	11950-RI-CD110	Scale	S2	Sheet/Section	P2
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Appendix F: Remaining Infrastructure Foul Water Drainage Design and Calculations

*Remaining Infrastructure;
Foul Water Catchment Areas*



NOTES

1 DO NOT SCALE THIS DRAWING ON PRINT OR ELECTRONICALLY. WORK FROM FIGURED DIMENSIONS ONLY.

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3 Read this drawing with all Architects, Service Engineers and CampbellReith's relevant details and drawings. NB: Set-out dimensions as per the Architects drawings take precedence.

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5 DRAWING STATUS

P - PRELIMINARY - Evolving drawings for approvals, Tenders, Bilings, etc.

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ONLY STATUS C DRAWINGS TO BE USED FOR CONSTRUCTION.

6 SUITABILITY CODE

WORK IN PROGRESS:

S0 - Work in progress

SHARED (NON-CONTRACTUAL):

S1 - For coordination, S2 - For information, S3 - For internal review and comment, S4 - For construction approval.

DOCUMENTATION (FOR CONTRACTOR PURPOSES):

D1 - For costing, D2 - For Tender, D3 - For contractor design, D4 - For manufacturer procurement.

CONSTRUCTION:

A - For construction, B - For construction but with comments (i.e. areas in abeyance), C - Comprehensive revisions required.

7

Denotes Section Number.

Denotes Drawing Number.

8. This drawing is to be read in conjunction with others in the CampbellReith 11950-R1 series.

9. All adoptable highway works to be carried out in accordance with DTT specification for highway works or as amended by West Sussex County Council S276/98 standard details.

Legend

Gravily Catchment

- 30-40 dph

- 40-50 dph

PS1 Catchment

- 40-50 dph

PS2 Catchment

- 30-40 dph

PS4 Catchment

- 40-50 dph

- 45-60 dph

- Employment space

Proposed Foul Water Sewer

Proposed Foul Rising Main

Planning Boundary

P2	BOUNDARY UPDATED	19.02.20	MJB
P1	ISSUED FOR INFORMATION	12.02.20	NB
Issue/rev	Description	Date	By

CampbellReith
consulting engineers

LONDON 020 7340 1700 ☐ MANCHESTER 0161 819 3060
SURREY 01737 784 500 ☐ BIRMINGHAM 01675 467 484
BRISTOL 0117 936 1066 ☐ DUBAI 00 971 4345 7088
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Job Title
KILNWOOD VALE, CRAWLEY

Client
CREST NICHOLSON

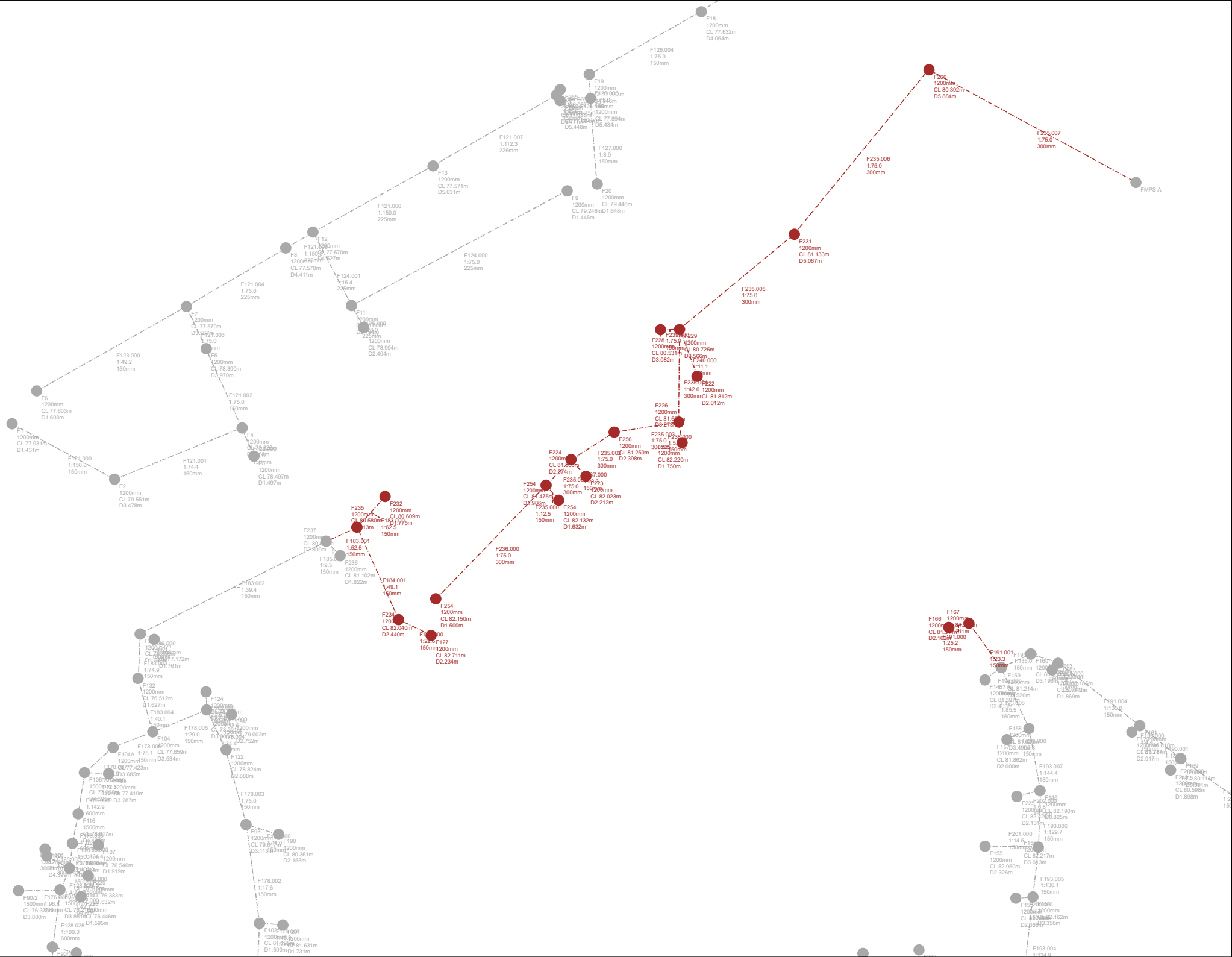
**PHASE 2 & 3 REMAINING
INFRASTRUCTURE
FW CATCHMENT AREAS**

drawn	date	scale @ A0	C1 checked	CR Project No.
NB	05.02.2020	1:1000	-	11950

Draw No.	11950-RI-CH109	Scale	S2	Issue/Revision	P2
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*Remaining Infrastructure;
MicroDrainage Foul Water Calculations*



CampbellReith		Page 1
Raven House 29 Linkfield Lane Surrey RH1 1SS	Remaining Infrastructure Kilnwood Vale Foul Water Calculations	
Date 14/02/2020	Designed by MJB	
File Kilnwood Drainage Model.mdx	Checked by BSF	
XP Solutions	Network 2019.1	

FOUL SEWERAGE DESIGN

Design Criteria for Foul - Main

Pipe Sizes STANDARD Manhole Sizes STANDARD

Industrial Flow (l/s/ha)	0.60	Add Flow / Climate Change (%)	0
Industrial Peak Flow Factor	6.00	Minimum Backdrop Height (m)	0.010
Flow Per Person (l/per/day)	222.00	Maximum Backdrop Height (m)	20.000
Persons per House	3.00	Min Design Depth for Optimisation (m)	1.500
Domestic (l/s/ha)	0.00	Min Vel for Auto Design only (m/s)	0.75
Domestic Peak Flow Factor	6.00	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Network Design Table for Foul - Main

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	Houses	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
F183.000	22.925	0.367	62.5	0.000	15	0.0	1.500	o	150	Pipe/Conduit	
F184.000	19.863	0.877	22.6	0.000	17	0.0	1.500	o	150	Pipe/Conduit	
F184.001	55.667	1.133	49.1	0.000	0	0.0	1.500	o	150	Pipe/Conduit	
F183.001	18.630	0.355	52.5	0.000	0	0.0	1.500	o	150	Pipe/Conduit	
F191.000	11.350	0.450	25.2	0.000	14	0.0	1.500	o	150	Pipe/Conduit	
F191.001	30.115	1.295	23.3	0.000	0	0.0	1.500	o	150	Pipe/Conduit	
F235.000	10.797	0.861	12.5	0.000	50	0.0	1.500	o	150	Pipe/Conduit	
F236.000	87.043	1.161	75.0	0.000	0	17.9	1.500	o	300	Pipe/Conduit	
F235.001	19.691	0.263	75.0	0.000	0	0.0	1.500	o	300	Pipe/Conduit	
F237.000	12.293	0.435	28.3	0.000	12	0.0	1.500	o	150	Pipe/Conduit	

Network Results Table

PN	US/IL (m)	Σ Area (ha)	Σ Base Flow (l/s)	Σ Hse	Add Flow (l/s)	P.Dep (mm)	P.Vel (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
F183.000	78.834	0.000	0.0	15	0.0	20	0.51	1.11	19.6	0.7
F184.000	80.477	0.000	0.0	17	0.0	16	0.76	1.85	32.6	0.8
F184.001	79.600	0.000	0.0	17	0.0	20	0.58	1.25	22.1	0.8
F183.001	78.467	0.000	0.0	32	0.0	27	0.69	1.21	21.4	1.5
F191.000	79.439	0.000	0.0	14	0.0	15	0.68	1.75	30.9	0.6
F191.001	78.989	0.000	0.0	14	0.0	15	0.70	1.82	32.2	0.6
F235.000	80.500	0.000	0.0	50	0.0	24	1.30	2.48	43.9	2.3
F236.000	80.650	0.000	17.9	0	0.0	81	1.17	1.60	113.3	17.9
F235.001	79.489	0.000	17.9	50	0.0	86	1.21	1.60	113.3	20.2
F237.000	79.811	0.000	0.0	12	0.0	15	0.63	1.65	29.2	0.6

CampbellReith		Page 2
Raven House 29 Linkfield Lane Surrey RH1 1SS	Remaining Infrastructure Kilnwood Vale Foul Water Calculations	
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XP Solutions	Network 2019.1	

Network Design Table for Foul - Main

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	Houses	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
F235.002	28.079	0.374	75.0	0.000	0	0.0	1.500	o	300	Pipe/Conduit	
F235.003	36.002	0.480	75.0	0.000	0	0.0	1.500	o	300	Pipe/Conduit	
F238.000	11.528	1.948	5.9	0.000	15	0.0	1.500	o	150	Pipe/Conduit	
F235.004	50.900	1.213	42.0	0.000	0	0.0	1.500	o	300	Pipe/Conduit	
F239.000	10.479	0.140	75.0	0.000	38	0.0	1.500	o	150	Pipe/Conduit	
F240.000	27.537	2.491	11.1	0.000	10	0.0	1.500	o	150	Pipe/Conduit	
F235.005	81.987	1.093	75.0	0.000	0	0.0	1.500	o	300	Pipe/Conduit	
F235.006	116.836	1.558	75.0	0.000	0	20.1	1.500	o	300	Pipe/Conduit	
F235.007	129.578	1.728	75.0	0.000	0	0.0	1.500	o	300	Pipe/Conduit	

Network Results Table

PN	US/IL (m)	Σ Area (ha)	Σ Base Flow (l/s)	Σ Hse Add Flow (l/s)	P.Dep (mm)	P.Vel (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
F235.002	79.226	0.000	17.9	62	0.0	87	1.22	1.60	113.3
F235.003	78.852	0.000	17.9	62	0.0	87	1.22	1.60	113.3
F238.000	80.470	0.000	0.0	15	0.0	11	1.14	3.62	63.9
F235.004	78.372	0.000	17.9	77	0.0	76	1.52	2.14	151.5
F239.000	77.449	0.000	0.0	38	0.0	32	0.64	1.01	17.9
F240.000	79.800	0.000	0.0	10	0.0	11	0.81	2.64	46.7
F235.005	77.159	0.000	17.9	125	0.0	93	1.27	1.60	113.3
F235.006	76.066	0.000	38.0	125	0.0	129	1.50	1.60	113.3
F235.007	74.508	0.000	38.0	125	0.0	129	1.50	1.60	113.3

CampbellReith		Page 3
Raven House 29 Linkfield Lane Surrey RH1 1SS	Remaining Infrastructure Kilnwood Vale Foul Water Calculations	
Date 14/02/2020	Designed by MJB	
File Kilnwood Drainage Model.mdx	Checked by BSF	
XP Solutions	Network 2019.1	

Manhole Schedules for Foul - Main

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	PN	Pipe Out Invert Level (m)	Diameter (mm)	PN	Pipes In Invert Level (m)	Diameter (mm)	Backdrop (mm)
F232	80.609	1.775	Open Manhole	1200	F183.000	78.834	150				
F127	82.711	2.234	Open Manhole	1200	F184.000	80.477	150				
F234	82.040	2.440	Open Manhole	1200	F184.001	79.600	150	F184.000	79.600	150	
F235	80.580	2.113	Open Manhole	1200	F183.001	78.467	150	F183.000	78.467	150	
								F184.001	78.467	150	
F166	81.541	2.102	Open Manhole	1200	F191.000	79.439	150				
F167	81.200	2.211	Open Manhole	1200	F191.001	78.989	150	F191.000	78.989	150	
F254	82.132	1.632	Open Manhole	1200	F235.000	80.500	150				
F254	82.150	1.500	Open Manhole	1200	F236.000	80.650	300				
F254	81.475	1.986	Open Manhole	1200	F235.001	79.489	300	F235.000	79.639	150	
								F236.000	79.489	300	
F223	82.023	2.212	Open Manhole	1200	F237.000	79.811	150				
F224	81.300	2.074	Open Manhole	1200	F235.002	79.226	300	F235.001	79.226	300	
								F237.000	79.376	150	
F256	81.250	2.398	Open Manhole	1200	F235.003	78.852	300	F235.002	78.852	300	
F225	82.220	1.750	Open Manhole	1200	F238.000	80.470	150				
F226	81.650	3.278	Open Manhole	1200	F235.004	78.372	300	F235.003	78.372	300	
								F238.000	78.522	150	
F228	80.531	3.082	Open Manhole	1200	F239.000	77.449	150				
F222	81.812	2.012	Open Manhole	1200	F240.000	79.800	150				
F229	80.725	3.566	Open Manhole	1200	F235.005	77.159	300	F235.004	77.159	300	
								F239.000	77.309	150	
								F240.000	77.309	150	
F231	81.133	5.067	Open Manhole	1200	F235.006	76.066	300	F235.005	76.066	300	
F266	80.392	5.884	Open Manhole	1200	F235.007	74.508	300	F235.006	74.508	300	
FMPS A	81.570	8.790	Open Manhole	1200		OUTFALL		F235.007	72.781	300	

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
F232	523483.337	135331.883	523483.337	135331.883	Required	
F127	523508.630	135255.521	523508.630	135255.521	Required	
F234	523490.771	135264.215	523490.771	135264.215	Required	
F235	523467.876	135314.956	523467.876	135314.956	Required	
F166	523793.273	135259.918	523793.273	135259.918	Required	



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Raven House 29 Linkfield Lane Surrey RH1 1SS	Remaining Infrastructure Kilnwood Vale Foul Water Calculations	
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XP Solutions	Network 2019.1	

Manhole Schedules for Foul - Main

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
F167	523804.390	135262.206	523804.390	135262.206	Required	
F254	523578.816	135329.833	523578.816	135329.833	Required	
F254	523511.237	135275.634	523511.237	135275.634	Required	
F254	523571.862	135338.093	523571.862	135338.093	Required	
F223	523593.796	135342.984	523593.796	135342.984	Required	
F224	523585.628	135352.172	523585.628	135352.172	Required	
F256	523609.324	135367.237	523609.324	135367.237	Required	
F225	523646.675	135361.407	523646.675	135361.407	Required	
F226	523644.894	135372.797	523644.894	135372.797	Required	
F228	523634.806	135423.546	523634.806	135423.546	Required	
F222	523654.929	135397.903	523654.929	135397.903	Required	
F229	523645.284	135423.696	523645.284	135423.696	Required	
F231	523708.426	135475.993	523708.426	135475.993	Required	
F266	523782.393	135566.434	523782.393	135566.434	Required	
FMPS A	523896.198	135504.475			No Entry	

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Raven House 29 Linkfield Lane Surrey RH1 1SS	Remaining Infrastructure Kilnwood Vale Foul Water Calculations	
Date 14/02/2020	Designed by MJB	
File Kilnwood Drainage Model.mdx	Checked by BSF	
XP Solutions	Network 2019.1	

PIPELINE SCHEDULES for Foul - Main

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
F183.000	o	150	F232	80.609	78.834	1.625	Open Manhole	1200
F184.000	o	150	F127	82.711	80.477	2.084	Open Manhole	1200
F184.001	o	150	F234	82.040	79.600	2.290	Open Manhole	1200
F183.001	o	150	F235	80.580	78.467	1.963	Open Manhole	1200
F191.000	o	150	F166	81.541	79.439	1.952	Open Manhole	1200
F191.001	o	150	F167	81.200	78.989	2.061	Open Manhole	1200
F235.000	o	150	F254	82.132	80.500	1.482	Open Manhole	1200
F236.000	o	300	F254	82.150	80.650	1.200	Open Manhole	1200
F235.001	o	300	F254	81.475	79.489	1.686	Open Manhole	1200
F237.000	o	150	F223	82.023	79.811	2.062	Open Manhole	1200
F235.002	o	300	F224	81.300	79.226	1.774	Open Manhole	1200
F235.003	o	300	F256	81.250	78.852	2.098	Open Manhole	1200
F238.000	o	150	F225	82.220	80.470	1.600	Open Manhole	1200
F235.004	o	300	F226	81.650	78.372	2.978	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
F183.000	22.925	62.5	F235	80.580	78.467	1.963	Open Manhole	1200
F184.000	19.863	22.6	F234	82.040	79.600	2.290	Open Manhole	1200
F184.001	55.667	49.1	F235	80.580	78.467	1.963	Open Manhole	1200
F183.001	18.630	52.5	F237	80.920	78.112	2.658	Open Manhole	1200
F191.000	11.350	25.2	F167	81.200	78.989	2.061	Open Manhole	1200
F191.001	30.115	23.3	F159	81.214	77.694	3.370	Open Manhole	1200
F235.000	10.797	12.5	F254	81.475	79.639	1.686	Open Manhole	1200
F236.000	87.043	75.0	F254	81.475	79.489	1.686	Open Manhole	1200
F235.001	19.691	75.0	F224	81.300	79.226	1.774	Open Manhole	1200
F237.000	12.293	28.3	F224	81.300	79.376	1.774	Open Manhole	1200
F235.002	28.079	75.0	F256	81.250	78.852	2.098	Open Manhole	1200
F235.003	36.002	75.0	F226	81.650	78.372	2.978	Open Manhole	1200
F238.000	11.528	5.9	F226	81.650	78.522	2.978	Open Manhole	1200
F235.004	50.900	42.0	F229	80.725	77.159	3.266	Open Manhole	1200

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Raven House 29 Linkfield Lane Surrey RH1 1SS	Remaining Infrastructure Kilnwood Vale Foul Water Calculations	
Date 14/02/2020	Designed by MJB	
File Kilnwood Drainage Model.mdx	Checked by BSF	
XP Solutions	Network 2019.1	

PIPELINE SCHEDULES for Foul - Main

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
F239.000	o	150	F228	80.531	77.449	2.932	Open Manhole	1200
F240.000	o	150	F222	81.812	79.800	1.862	Open Manhole	1200
F235.005	o	300	F229	80.725	77.159	3.266	Open Manhole	1200
F235.006	o	300	F231	81.133	76.066	4.767	Open Manhole	1200
F235.007	o	300	F266	80.392	74.508	5.584	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
F239.000	10.479	75.0	F229	80.725	77.309	3.266	Open Manhole	1200
F240.000	27.537	11.1	F229	80.725	77.309	3.266	Open Manhole	1200
F235.005	81.987	75.0	F231	81.133	76.066	4.767	Open Manhole	1200
F235.006	116.836	75.0	F266	80.392	74.508	5.584	Open Manhole	1200
F235.007	129.578	75.0	FMPS A	81.570	72.781	8.490	Open Manhole	1200

CampbellReith		Page 7
Raven House 29 Linkfield Lane Surrey RH1 1SS	Remaining Infrastructure Kilnwood Vale Foul Water Calculations	
Date 14/02/2020	Designed by MJB	
File Kilnwood Drainage Model.mdx	Checked by BSF	
XP Solutions		Network 2019.1

Area Summary for Foul - Main

Pipe Number	Gross Area (ha)	Pipe Total (ha)
183.000	0.000	0.000
184.000	0.000	0.000
184.001	0.000	0.000
183.001	0.000	0.000
191.000	0.000	0.000
191.001	0.000	0.000
235.000	0.000	0.000
236.000	0.000	0.000
235.001	0.000	0.000
237.000	0.000	0.000
235.002	0.000	0.000
235.003	0.000	0.000
238.000	0.000	0.000
235.004	0.000	0.000
239.000	0.000	0.000
240.000	0.000	0.000
235.005	0.000	0.000
235.006	0.000	0.000
235.007	0.000	0.000
Total		Total
0.000		0.000

Free Flowing Outfall Details for Foul - Main

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
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F235.007	FMPS A	81.570	72.781	0.000	1200	0
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Simulation Criteria for Foul - Main

Volumetric Runoff Coeff	0.840	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m ³ /ha Storage	3.000
Hot Start (mins)	0	Inlet Coefficient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 0 Number of Storage Structures 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Winter
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	20.000	Storm Duration (mins)	30
Ratio R	0.349		

Appendix G: Pipe Bedding Details in Landfill Material