



River Academy, Reading

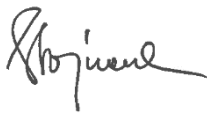
Drainage Statement

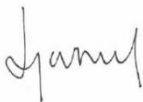
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1.0 Introduction

Hexa Consulting have been appointed by Bowmer and Kirkland to provide a Drainage Strategy Statement for the proposed school development at Richfield Avenue, Reading.

This document has been produced to assess the existing site drainage characteristics and how these will be affected by the proposals.

The intended use of this document is to be used in support of a planning application for the development.

2.0 Surface Water Drainage

2.1 National guidelines

The aim of the surface water drainage proposals is to focus on the capture and management the surface water within the site boundary, to prevent any likelihood of flooding to the proposed development, adjacent sites, and infrastructure.

General national guidance for the design of the surface water drainage systems include the following:

- National Planning Policy Framework (NPPF)
- Non-Statutory Technical Standards for Sustainable Drainage Systems, DEFRA, March 2015
- Written Ministerial Statement regarding Sustainable Drainage (HCWS161)
- The SUDS Manual – C753, CIRIA Industry Best Practice Guidance
- Flood Risk Planning Practice Guidance
- Building Regulations Part H

The NPPF recognises that flood risk and other environmental damage can be managed by minimising changes to the volume and rate of surface runoff from development sites and recommends that priority is given to the use of Sustainable Drainage Systems (SuDS) in new developments.

Building Regulations 2010 Requirement H3 stipulates that rainwater from roofs and paved areas is carried away from the surface to discharge to one of the following, listed in order of hierarchy:

- Discharge into the ground
- Discharge to a surface water body
- Discharge to a surface water sewer
- Discharge to a combined sewer where there are absolutely no other options and only where agreed in advance with the relevant sewage undertaker

2.2 Existing surface water strategy

Based on the findings of topographical and CCTV drainage surveys, the rainfall runoff on site is understood to be managed by a system of gullies and rainwater pipes, with no flow restriction or any natural or engineered storage.

The overall site covers an area of approximately 5.55ha (3.99ha northern site and 1.56ha southern site). At least 0.24ha is currently fully impermeable and positively drained – this is formed by roofs and hardstanding (asphalt) and discharging to the ditches crossing the site.

Using the Modified Rational Method, the existing average annual peak flow from site is estimated to be 34l/s. The actual runoff rate is likely to be higher as the site has substantial areas of compacted stone used for roads and car parking which appear to be served by a drainage system but have been excluded from the above estimate.

The annual average greenfield runoff rate, Q_{bar} , has been calculated as 0.85l/s using the HR Wallingford's Greenfield Runoff Estimation Toolkit.

The greenfield run-off calculations can be found in Appendix A.

2.3 Proposed surface water strategy

Soakaways are considered unviable on this site due to the previous use as landfill. It is also recommended that all surface water storage features are sealed to prevent contamination.

The surface water network is proposed to discharge by gravity to an existing ditch running through the site – similarly to the pre-development scenario, but via new connections to the ditch. Discharge rates are proposed to be restricted to 6l/s in the northern section of the site (4 l/s and 2 l/s for school buildings drainage network and 2l/s for pitch network, respectively) and 2l/s in the southern car park area. These rates are suggested to be as close to greenfield rates as possible, without causing excessive maintenance issues.

Surface water storage is to be provided on site to ensure no surface water flooding to buildings and outside of site extent in storm events up to 1 in 100 years + 40% allowance for climate change. The car park site is to utilise permeable block paving within parking bays, whilst the school site will benefit from a porous MUGA and below ground attenuation tanks as part of the sustainable surface water drainage strategy.

A hydraulic model of the system has been created in line with the above and its simulation results are included in Appendix B.

The surface water drainage strategy drawing is included in Appendix C.

The maintenance of the new drainage system will be undertaken or arranged for by school.

3.0 Foul Water Drainage

The foul water network will be pumped from the southern section of the site, discharging to the public Thames Water sewerage system.

A private pumping station is to be installed in the south-eastern corner of the site. A private rising main will be installed within Richfield Avenue directly to the Thames Water sewer, or alternatively to a break chamber in the south-western corner of the site where a gravity-fed sewer would be installed to the nearest Thames Water manhole. Both options are under considerations until further surveys are undertaken.

The foul water drainage strategy drawing is included in Appendix D.

4.0 Appendices

Appendix A – Greenfield runoff calculations

Appendix B – Proposed surface water network calculations

Appendix C – Proposed surface water drainage layout

Appendix D – Proposed foul water drainage layout

Appendix A – Greenfield runoff calculations

Calculated by:

Site name:

Site location:

Site Details

Latitude:

Longitude:

Reference:

Date:

This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance "Rainfall runoff management for developments", SC030219 (2013), the SuDS Manual C753 (Ciria, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Runoff estimation approach

Site characteristics

Total site area (ha):

Methodology

Q_{BAR} estimation method:

SPR estimation method:

Soil characteristics

Default

Edited

SOIL type:

HOST class:

SPR/SPRHOST:

Hydrological characteristics

Default

Edited

SAAR (mm):

Hydrological region:

Growth curve factor 1 year:

Growth curve factor 30 years:

Growth curve factor 100 years:

Growth curve factor 200 years:

Notes

(1) Is $Q_{BAR} < 2.0$ l/s/ha?

When Q_{BAR} is < 2.0 l/s/ha then limiting discharge rates are set at 2.0 l/s/ha.

(2) Are flow rates < 5.0 l/s?

Where flow rates are less than 5.0 l/s consent for discharge is usually set at 5.0 l/s if blockage from vegetation and other materials is possible. Lower consent flow rates may be set where the blockage risk is addressed by using appropriate drainage elements.

(3) Is $SPR/SPRHOST \leq 0.3$?

Where groundwater levels are low enough the use of soakaways to avoid discharge offsite would normally be preferred for disposal of surface water runoff.

Greenfield runoff rates

Default

Edited

Q_{BAR} (l/s):

1 in 1 year (l/s):

1 in 30 years (l/s):

1 in 100 year (l/s):

1 in 200 years (l/s):

This report was produced using the greenfield runoff tool developed by HR Wallingford and available at www.uksuds.com. The use of this tool is subject to the UK SuDS terms and conditions and licence agreement, which can both be found at www.uksuds.com/terms-and-conditions.htm. The outputs from this tool are estimates of greenfield runoff rates. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, CEH, Hydrosolutions or any other organisation for the use of this data in the design or operational characteristics of any drainage scheme.

Appendix B – Proposed surface water network calculations

Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	1	Maximum Rainfall (mm/hr)	50.0
Additional Flow (%)	0	Minimum Velocity (m/s)	1.00
FSR Region	England and Wales	Connection Type	Level Soffits
M5-60 (mm)	17.000	Minimum Backdrop Height (m)	0.200
Ratio-R	0.400	Preferred Cover Depth (m)	0.600
CV	0.750	Include Intermediate Ground	✓
Time of Entry (mins)	5.00	Enforce best practice design rules	✓

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
1	0.072	5.00	39.050	1200	470415.059	174500.876	0.900
2	0.079	5.00	39.000	1200	470439.052	174501.836	0.949
3	0.079	5.00	39.000	1200	470440.544	174473.460	1.044
4	0.404	5.00	39.400	1200	470482.120	174475.324	1.614
5	0.079	5.00	38.900	1350	470484.156	174439.184	1.337
6	0.044	5.00	38.900	1350	470439.053	174437.186	1.477
7	0.163	5.00	38.800	1350	470349.364	174491.609	0.975
8	0.202	5.00	38.800	1350	470352.614	174426.206	1.193
9	0.225	5.00	38.800	1200	470408.722	174471.091	0.825
10	0.000	5.00	38.800	1350	470418.008	174422.983	1.800
OUT			38.800	1350	470418.355	174416.693	1.816

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.000	1	2	24.012	0.600	38.150	38.051	0.099	242.5	300	5.40	45.1
1.001	2	3	28.415	0.600	38.051	37.956	0.095	300.0	300	5.92	43.2
1.002	3	4	41.618	0.600	37.956	37.786	0.170	244.8	300	6.62	41.0
1.003	4	5	36.197	0.600	37.786	37.638	0.148	244.6	300	7.22	39.3
1.004	5	6	45.147	0.600	37.563	37.423	0.140	322.5	375	7.97	37.4
1.005	6	10	25.389	0.600	37.423	37.344	0.079	321.4	375	8.39	36.4
2.000	7	8	65.484	0.600	37.825	37.607	0.218	300.0	375	6.05	42.8
2.001	8	10	65.473	0.600	37.607	37.405	0.202	324.1	375	7.14	39.5
3.000	9	10	48.996	0.600	37.975	37.686	0.289	169.5	225	5.82	43.6
1.006	10	OUT	6.300	0.600	37.000	36.984	0.016	393.7	450	8.49	36.1

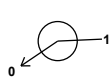
Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1.000	1.005	71.0	8.8	0.600	0.649	0.072	0.0	71	0.691
1.001	0.902	63.8	17.7	0.649	0.744	0.151	0.0	108	0.774
1.002	1.000	70.7	25.6	0.744	1.314	0.230	0.0	125	0.922
1.003	1.001	70.7	67.5	1.314	0.962	0.634	0.0	236	1.133
1.004	1.003	110.8	72.2	0.962	1.102	0.713	0.0	221	1.066
1.005	1.005	111.0	74.6	1.102	1.081	0.757	0.0	225	1.075
2.000	1.041	114.9	18.9	0.600	0.818	0.163	0.0	102	0.774
2.001	1.001	110.5	39.1	0.818	1.020	0.365	0.0	153	0.916
3.000	1.001	39.8	26.6	0.600	0.889	0.225	0.0	135	1.071
1.006	1.018	161.9	131.9	1.350	1.366	1.347	0.0	310	1.130

Pipeline Schedule

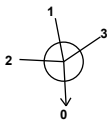
Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.000	24.012	242.5	300	Circular	39.050	38.150	0.600	39.000	38.051	0.649
1.001	28.415	300.0	300	Circular	39.000	38.051	0.649	39.000	37.956	0.744
1.002	41.618	244.8	300	Circular	39.000	37.956	0.744	39.400	37.786	1.314
1.003	36.197	244.6	300	Circular	39.400	37.786	1.314	38.900	37.638	0.962
1.004	45.147	322.5	375	Circular	38.900	37.563	0.962	38.900	37.423	1.102
1.005	25.389	321.4	375	Circular	38.900	37.423	1.102	38.800	37.344	1.081
2.000	65.484	300.0	375	Circular	38.800	37.825	0.600	38.800	37.607	0.818
2.001	65.473	324.1	375	Circular	38.800	37.607	0.818	38.800	37.405	1.020
3.000	48.996	169.5	225	Circular	38.800	37.975	0.600	38.800	37.686	0.889
1.006	6.300	393.7	450	Circular	38.800	37.000	1.350	38.800	36.984	1.366

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	1	1200	Manhole	Adoptable	2	1200	Manhole	Adoptable
1.001	2	1200	Manhole	Adoptable	3	1200	Manhole	Adoptable
1.002	3	1200	Manhole	Adoptable	4	1200	Manhole	Adoptable
1.003	4	1200	Manhole	Adoptable	5	1350	Manhole	Adoptable
1.004	5	1350	Manhole	Adoptable	6	1350	Manhole	Adoptable
1.005	6	1350	Manhole	Adoptable	10	1350	Manhole	Adoptable
2.000	7	1350	Manhole	Adoptable	8	1350	Manhole	Adoptable
2.001	8	1350	Manhole	Adoptable	10	1350	Manhole	Adoptable
3.000	9	1200	Manhole	Adoptable	10	1350	Manhole	Adoptable
1.006	10	1350	Manhole	Adoptable	OUT	1350	Manhole	Adoptable

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
1	470415.059	174500.876	39.050	0.900	1200				
						0	1.000	38.150	300
2	470439.052	174501.836	39.000	0.949	1200		1	1.000	38.051
						0	1.001	38.051	300
3	470440.544	174473.460	39.000	1.044	1200		1	1.001	37.956
						0	1.002	37.956	300
4	470482.120	174475.324	39.400	1.614	1200		1	1.002	37.786
						0	1.003	37.786	300
5	470484.156	174439.184	38.900	1.337	1350		1	1.003	37.638
						0	1.004	37.563	375
6	470439.053	174437.186	38.900	1.477	1350		1	1.004	37.423
						0	1.005	37.423	375

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)	
7	470349.364	174491.609	38.800	0.975	1350		0	2.000	37.825	375
8	470352.614	174426.206	38.800	1.193	1350		1	2.000	37.607	375
							0	2.001	37.607	375
9	470408.722	174471.091	38.800	0.825	1200		0	3.000	37.975	225
10	470418.008	174422.983	38.800	1.800	1350		1	3.000	37.686	225
							2	2.001	37.405	375
							3	1.005	37.344	375
							0	1.006	37.000	450
OUT	470418.355	174416.693	38.800	1.816	1350		1	1.006	36.984	450

Simulation Settings

Rainfall Methodology	FSR	Analysis Speed	Normal
FSR Region	England and Wales	Skip Steady State	x
M5-60 (mm)	17.000	Drain Down Time (mins)	240
Ratio-R	0.400	Additional Storage (m³/ha)	20.0
Summer CV	0.750	Check Discharge Rate(s)	x
Winter CV	0.840	Check Discharge Volume	x

Storm Durations

15	30	60	120	180	240	360	480	600	720	960	1440
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Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
1	0	0	0
30	0	0	0
100	40	0	0

Node 10 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	37.000	Product Number	CTL-SHE-0085-4000-1700-4000
Design Depth (m)	1.700	Min Outlet Diameter (m)	0.100
Design Flow (l/s)	4.0	Min Node Diameter (mm)	1200

Node 4 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	38.300
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	1750.0	0.0	0.400	1750.0	0.0	0.401	0.0	0.0

Node 7 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	37.825
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	250.0	0.0	0.400	250.0	0.0	0.401	0.0	0.0

Node 9 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	37.975
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	300.0	0.0	0.400	300.0	0.0	0.401	0.0	0.0

Node 4 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	38.800	Slope (1:X)	1000.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	0	Depth (m)	0.350
Safety Factor	2.0	Width (m)	36.000	Inf Depth (m)	
Porosity	0.30	Length (m)	72.000		

Results for 1 year Critical Storm Duration. Lowest mass balance: 91.81%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	1	10	38.219	0.069	8.6	0.1882	0.0000	OK
30 minute winter	2	21	38.196	0.145	13.8	0.4061	0.0000	OK
30 minute winter	3	21	38.193	0.237	24.5	0.6259	0.0000	OK
30 minute winter	4	22	38.180	0.394	57.2	2.4208	0.0000	SURCHARGED
15 minute winter	5	13	38.125	0.562	72.8	1.4690	0.0000	SURCHARGED
15 minute winter	6	13	38.102	0.679	67.9	1.3756	0.0000	SURCHARGED
360 minute winter	7	344	38.099	0.274	17.0	66.4706	0.0000	OK
360 minute winter	8	344	38.099	0.492	14.9	2.3722	0.0000	SURCHARGED
360 minute winter	9	344	38.099	0.124	7.9	36.2937	0.0000	OK
360 minute winter	10	344	38.099	1.099	14.7	1.5732	0.0000	SURCHARGED
15 minute summer	OUT	1	36.984	0.000	3.4	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	1	1.000	2	8.4	0.483	0.118	0.4537	
30 minute winter	2	1.001	3	13.9	0.648	0.217	1.3273	
30 minute winter	3	1.002	4	20.4	0.527	0.289	2.7061	
30 minute winter	4	1.003	5	53.0	1.010	0.749	2.5490	
15 minute winter	5	1.004	6	63.0	0.880	0.569	4.9796	
15 minute winter	6	1.005	10	68.3	0.619	0.615	2.8003	
360 minute winter	7	2.000	8	-14.2	-0.222	-0.124	6.4405	
360 minute winter	8	2.001	10	-11.3	0.330	-0.103	7.2215	
360 minute winter	9	3.000	10	-4.8	0.389	-0.121	1.5261	
360 minute winter	10	Hydro-Brake®	OUT	3.4				109.8

Results for 30 year Critical Storm Duration. Lowest mass balance: 91.81%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	1	11	38.548	0.398	19.9	1.0880	0.0000	SURCHARGED
15 minute winter	2	11	38.540	0.489	41.7	1.3684	0.0000	SURCHARGED
15 minute winter	3	10	38.503	0.547	65.2	1.4476	0.0000	SURCHARGED
600 minute winter	4	585	38.386	0.600	23.5	148.1292	0.0000	SURCHARGED
600 minute winter	5	585	38.386	0.823	17.3	2.1511	0.0000	SURCHARGED
120 minute winter	6	70	38.404	0.981	55.5	1.9889	0.0000	SURCHARGED
60 minute winter	7	45	38.419	0.594	93.2	97.9537	0.0000	SURCHARGED
120 minute winter	8	70	38.417	0.810	52.2	3.9002	0.0000	SURCHARGED
600 minute winter	9	585	38.386	0.411	23.4	116.8504	0.0000	SURCHARGED
120 minute winter	10	70	38.406	1.406	55.3	2.0119	0.0000	SURCHARGED
15 minute summer	OUT	1	36.984	0.000	3.5	0.0000	0.0000	OK

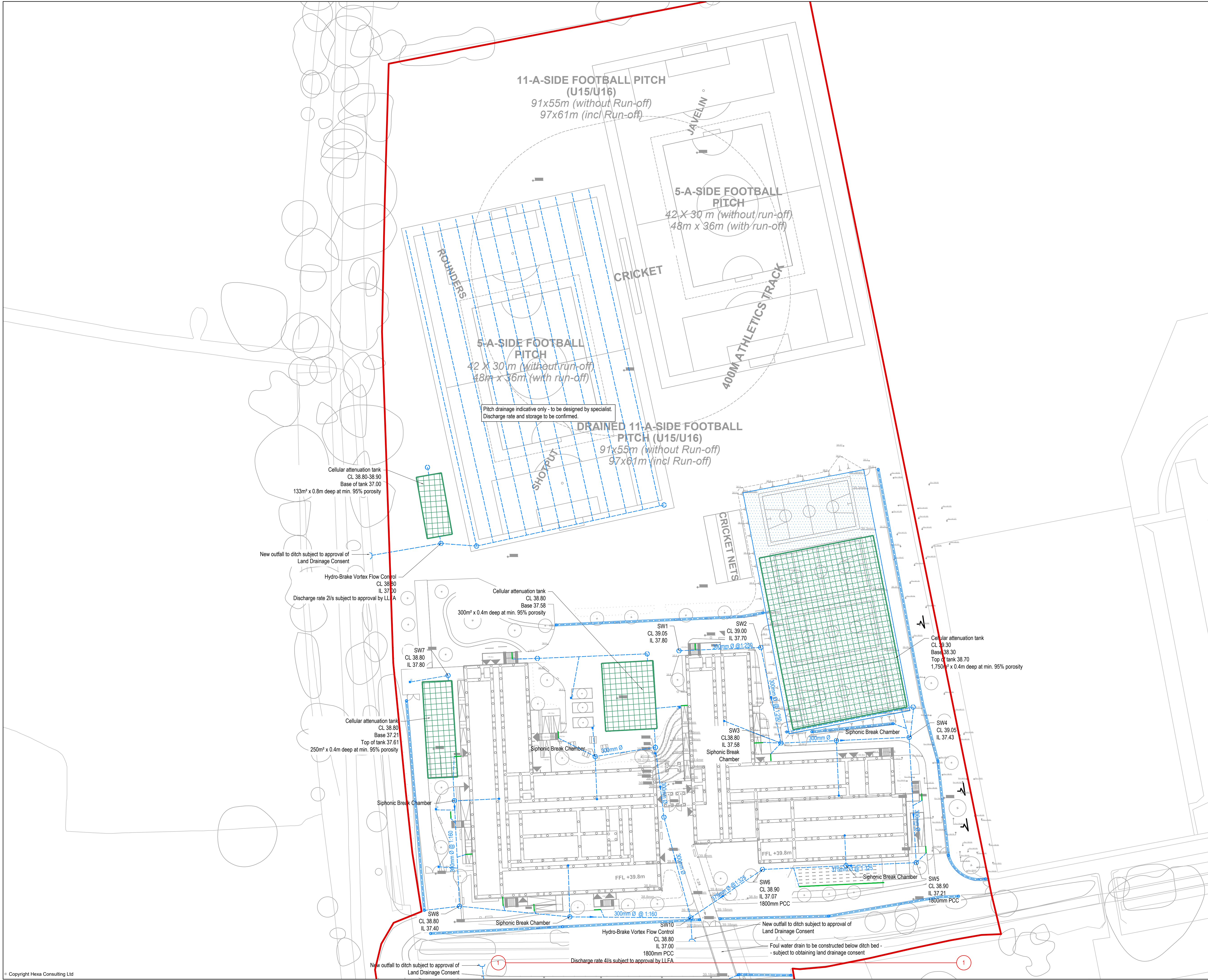
Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	1	1.000	2	23.1	0.563	0.325	1.6909	
15 minute winter	2	1.001	3	43.5	0.726	0.683	2.0010	
15 minute winter	3	1.002	4	66.2	0.941	0.937	2.9307	
600 minute winter	4	1.003	5	15.2	0.525	0.215	2.5490	
600 minute winter	5	1.004	6	17.2	0.449	0.155	4.9796	
120 minute winter	6	1.005	10	55.3	0.513	0.499	2.8003	
60 minute winter	7	2.000	8	-69.0	-0.778	-0.600	7.2227	
120 minute winter	8	2.001	10	-34.2	0.413	-0.310	7.2215	
600 minute winter	9	3.000	10	-17.3	-0.434	-0.434	1.9486	
120 minute winter	10	Hydro-Brake®	OUT	3.7				74.1

Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 91.81%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	1	11	39.023	0.873	37.9	2.3833	0.0000	FLOOD RISK
15 minute winter	2	11	38.992	0.941	73.8	2.6301	0.0000	FLOOD RISK
15 minute winter	3	11	38.837	0.881	111.7	2.3287	0.0000	FLOOD RISK
960 minute winter	4	945	38.650	0.864	41.7	588.7081	0.0000	SURCHARGED
960 minute winter	5	945	38.650	1.087	20.9	2.8408	0.0000	FLOOD RISK
120 minute winter	6	76	38.681	1.258	66.1	2.5502	0.0000	FLOOD RISK
60 minute summer	7	36	38.800	0.975	144.0	99.7744	0.7633	FLOOD
60 minute summer	8	36	38.779	1.172	92.6	5.6480	0.0000	FLOOD RISK
120 minute winter	9	76	38.800	0.825	70.6	119.5760	1.0196	FLOOD
120 minute winter	10	76	38.713	1.713	64.9	2.4507	0.0000	FLOOD RISK
15 minute summer	OUT	1	36.984	0.000	3.7	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	1	1.000	2	34.6	0.589	0.486	1.6909	
15 minute winter	2	1.001	3	72.6	1.031	1.139	2.0010	
15 minute winter	3	1.002	4	110.8	1.574	1.568	2.9307	
960 minute winter	4	1.003	5	-20.8	0.547	-0.294	2.5490	
960 minute winter	5	1.004	6	-18.3	0.453	-0.165	4.9796	
120 minute winter	6	1.005	10	-60.9	-0.552	-0.549	2.8003	
60 minute summer	7	2.000	8	-89.0	-0.833	-0.774	7.2227	
60 minute summer	8	2.001	10	88.5	0.803	0.801	7.2215	
120 minute winter	9	3.000	10	-34.9	-0.877	-0.877	1.9486	
120 minute winter	10	Hydro-Brake®	OUT	4.0				78.5

Appendix C – Proposed surface water drainage layout



Notes

1.

Do not scale this drawing. All dimensions must be checked/ verified on site. If in doubt ask.

2.

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

3.

All dimensions in millimetres unless noted otherwise. All levels in metres unless noted otherwise.

4.

Any discrepancies noted on site are to be reported to the engineer immediately.

DN HOOP

Site boundary

Existing public surface water sewer

Proposed surface water drain

Surface water manhole 1200mm PCC unless shown otherwise

Surface water inspection chamber - 600mm PPIC unless shown otherwise

Road gully

Rainwater siphonic downpipe

Filter drain

Permeable paving

Channel drain with sump unit at outfall

Design Notes

1.

Surface water discharge rate subject subject to approval by Lead Local Flood Authority. Construction of new connections subject to obtaining Land Drainage Consent.

2.

Site levels based on landscape architect (Ares) site layout received on 06/10/21.

3.

Surface water storage design storm - 100 year plus 40% climate change allowance.

4.

Permeable parking based on 350mm design depth for sub-base.

5.

Siphonic downpipe locations indicative only.

P05

13/12/21

SITE BOUNDARY REVISED

P04

09/12/21

PLANNING SUBMISSION

P03

12/11/21

PITCH DRAINAGE PROVISION REDUCED

P02

13/10/21

DRAFT CONTRACTOR PROPOSALS SUBMISSION

P01

24/09/21

PRELIMINARY ISSUE

REV

DATE

DESCRIPTION

CLIENT

Department
for Education

CONTRACTOR

BOWMER
KIRKLAND

CONSULTANT

hexa
CONSULTING

PROJECT

RIVER ACADEMY, READING

DRAWING TITLE

SURFACE WATER DRAINAGE LAYOUT
SHEET 1

DRAWING PURPOSE

PLANNING SUBMISSION

DRAWN BY

DATE

CHK'D BY

SCALE

MEDIA

AW

24.09.21

JG

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A1

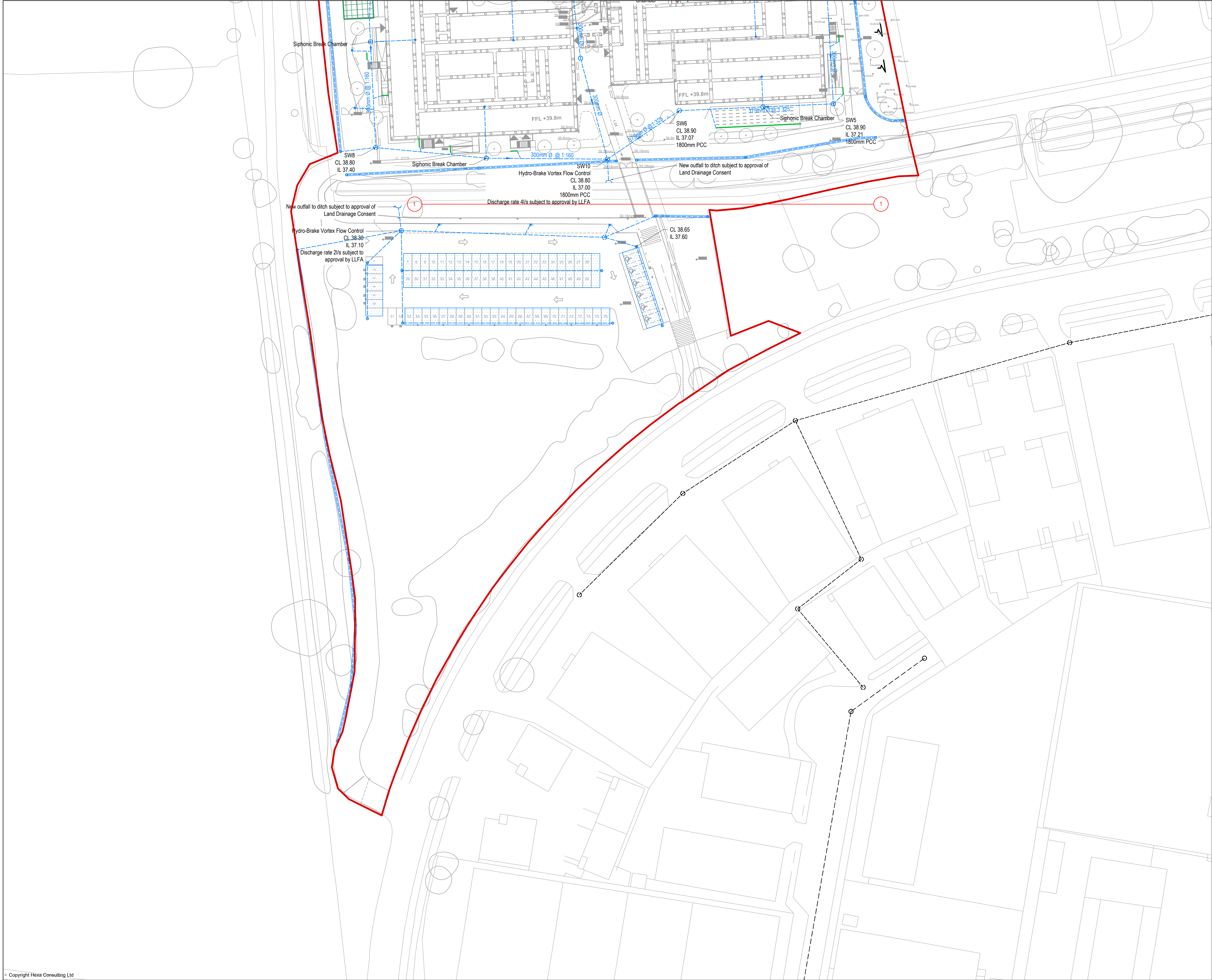
PROJECT - ORIGINATOR - ZONE - LEVEL - TYPE - ROLE - NUMBER

REVISION

FS0949-HEX-XX-XX-DR-C-9200

P05

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Notes

1. Do not scale this drawing. All dimensions must be checked/ verified on site. If in doubt ask.
2. This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.
3. All dimensions in millimetres unless noted otherwise. All levels in metres unless noted otherwise.
4. Any discrepancies noted on site are to be reported to the engineer immediately.

DN HOOP

- Site boundary
- Existing public surface water sewer
- Proposed surface water drain
- Surface water manhole 1200mm PCC unless shown otherwise
- Surface water inspection chamber - 600mm PPIC unless shown otherwise
- Road gully
- Rainwater siphonic downpipe
- Filter drain
- Permeable paving
- Channel drain with sump unit at outfall

Design Notes

1. Surface water discharge rate subject subject to approval by Lead Local Flood Authority. Construction of new connections subject to obtaining Land Drainage Consent.
2. Site levels based on landscape architect (Ares) site layout received on 06/10/21.
3. Surface water storage design storm - 100 year plus 40% climate change allowance.
4. Permeable parking based on 350mm design depth for sub-base.
5. Siphonic downpipe locations indicative only.

P05	13/12/21	SITE BOUNDARY REVISED
P04	09/12/21	PLANNING SUBMISSION
P03	12/11/21	AMENDED TO SUIT REVISED SITE LAYOUT
P02	13/10/21	DRAFT CONTRACTOR PROPOSALS SUBMISSION
P01	24/09/21	PRELIMINARY ISSUE
REV	DATE	DESCRIPTION

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Department
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CONTRACTOR



CONSULTANT



PROJECT

RIVER ACADEMY, READING

DRAWING TITLE

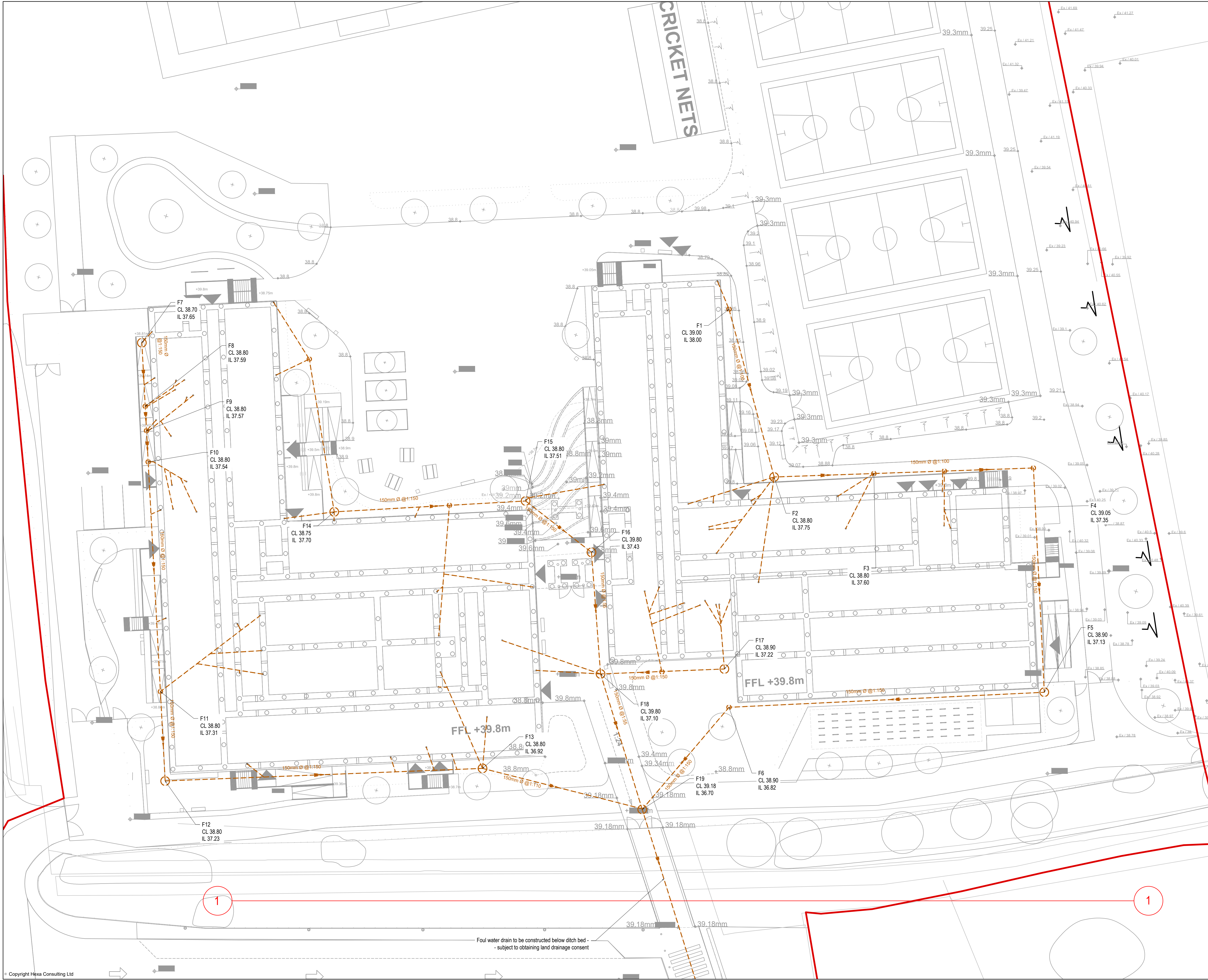
SURFACE WATER DRAINAGE LAYOUT
SHEET 2

DRAWING PURPOSE

PLANNING SUBMISSION

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AW	24.09.21	JG	1:500	A1
PROJECT - ORIGINATOR - ZONE - LEVEL - TYPE - ROLE - NUMBER				REVISION
FS0949-HEX-XX-XX-DR-C-9201				P05

Appendix D – Proposed foul water drainage layout



Notes

1. Do not scale this drawing. All dimensions must be checked/ verified on site. If in doubt ask.
2. This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.
3. All dimensions in millimetres unless noted otherwise. All levels in metres unless noted otherwise.
4. Any discrepancies noted on site are to be reported to the engineer immediately.

- all
- Existing public foul water sewer
 - Foul water downpipe
 - Proposed foul water drain
 - Foul water manhole/chamber - 1200mm PC/450mm PPIC
 - Proposed foul water discharge route - Option 1
 - Proposed foul water discharge route - Option 2

Design Notes

1. Foul water pop ups based on above-ground drainage drawings provided by M&E Engineer (CPW) on14/10/21.
2. Connection to public foul water sewer subject to Section 106 approval by Thames Water.

P03	13/12/21	SITE BOUNDARY REVISED
P02	09/12/21	PLANNING SUBMISSION
P01	14/10/21	DRAFT CONTRACTOR PROPOSALS SUBMISSION
REV	DATE	DESCRIPTION

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PROJECT

RIVER ACADEMY, READING

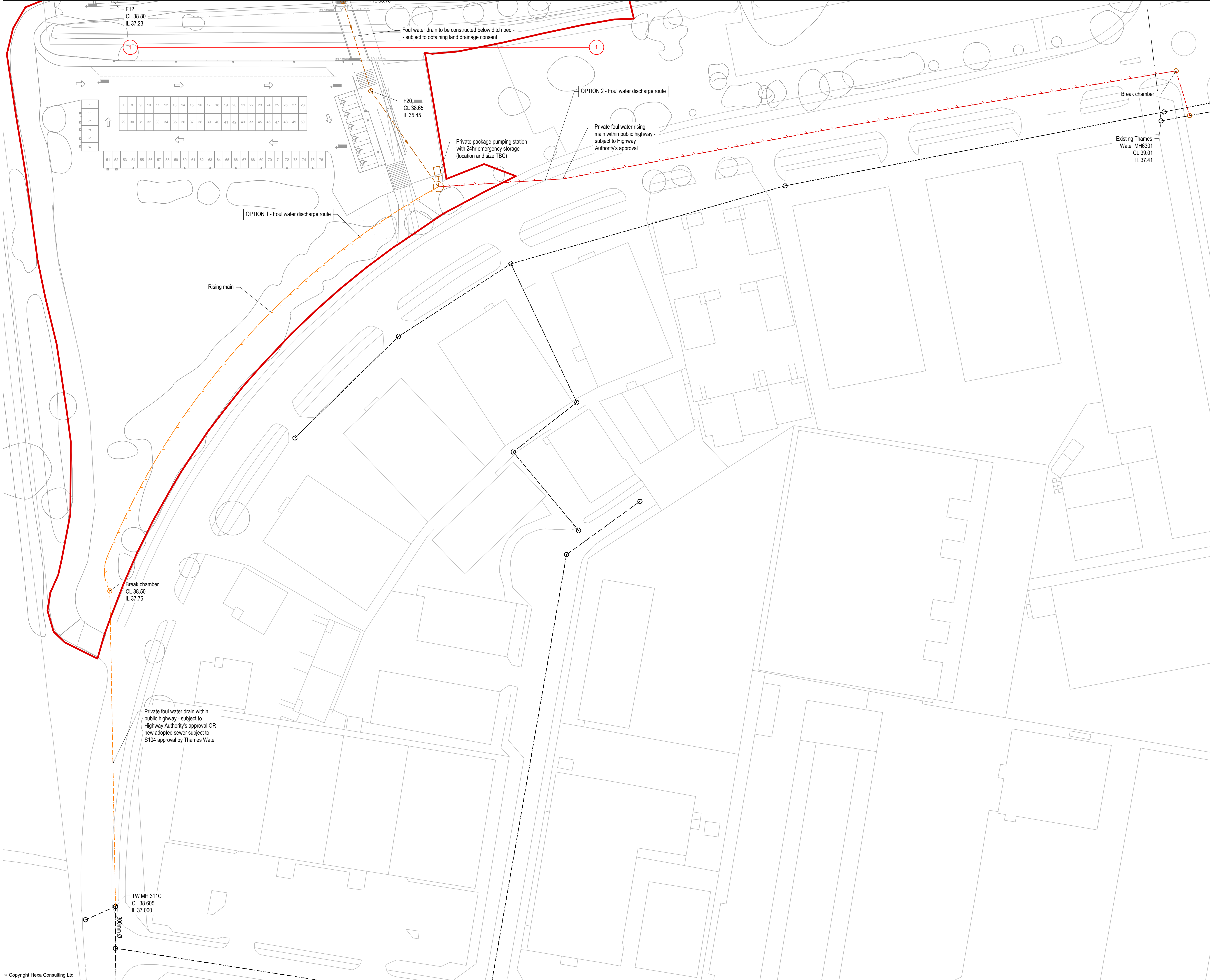
DRAWING TITLE

FOUL WATER DRAINAGE LAYOUT
SHEET 1

DRAWING PURPOSE

PLANNING SUBMISSION

DRAWN BY	DATE	CHK'D BY	SCALE	MEDIA
AW	24.09.21	JG	1:250	A1
PROJECT - ORIGINATOR - ZONE - LEVEL - TYPE - ROLE - NUMBER				REVISION
FS0949-HEX-XX-XX-DR-C-9202				P03



Notes

1. Do not scale this drawing. All dimensions must be checked/ verified on site. If in doubt ask.

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

3. All dimensions in millimetres unless noted otherwise. All levels in metres unless noted otherwise.

4. Any discrepancies noted on site are to be reported to the engineer immediately.

Existing public foul water sewer

Foul water downpipe

Proposed foul water drain

Foul water manhole/chamber - 1200mm PC/450mm PPIC

Proposed foul water discharge route - Option 1

Proposed foul water discharge route - Option 2

all

Design Notes

1. Foul water pop ups based on above-ground drainage drawings provided by M&E Engineer (CPW) on14/10/21.

2. Connection to public foul water sewer subject to Section 106 approval by Thames Water.

P0313/12/21SITE BOUNDARY REVISED

P0209/12/21PLANNING SUBMISSION

P0113/10/21DRAFT CONTRACTOR PROPOSALS SUBMISSION

REVDATEDESCRIPTION

CLIENT

Department
for Education

CONTRACTOR

BOWMER
KIRKLAND

CONSULTANT

hexa
CONSULTING

PROJECT

RIVER ACADEMY, READING

DRAWING TITLE

FOUL WATER DRAINAGE LAYOUT
SHEET 2

DRAWING PURPOSE

PLANNING SUBMISSION

DRAWN BY

DATE

CHK'D BY

SCALE

MEDIA

AW

24.09.21

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PROJECT - ORIGINATOR - ZONE - LEVEL - TYPE - ROLE - NUMBER

REVISION

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P03

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