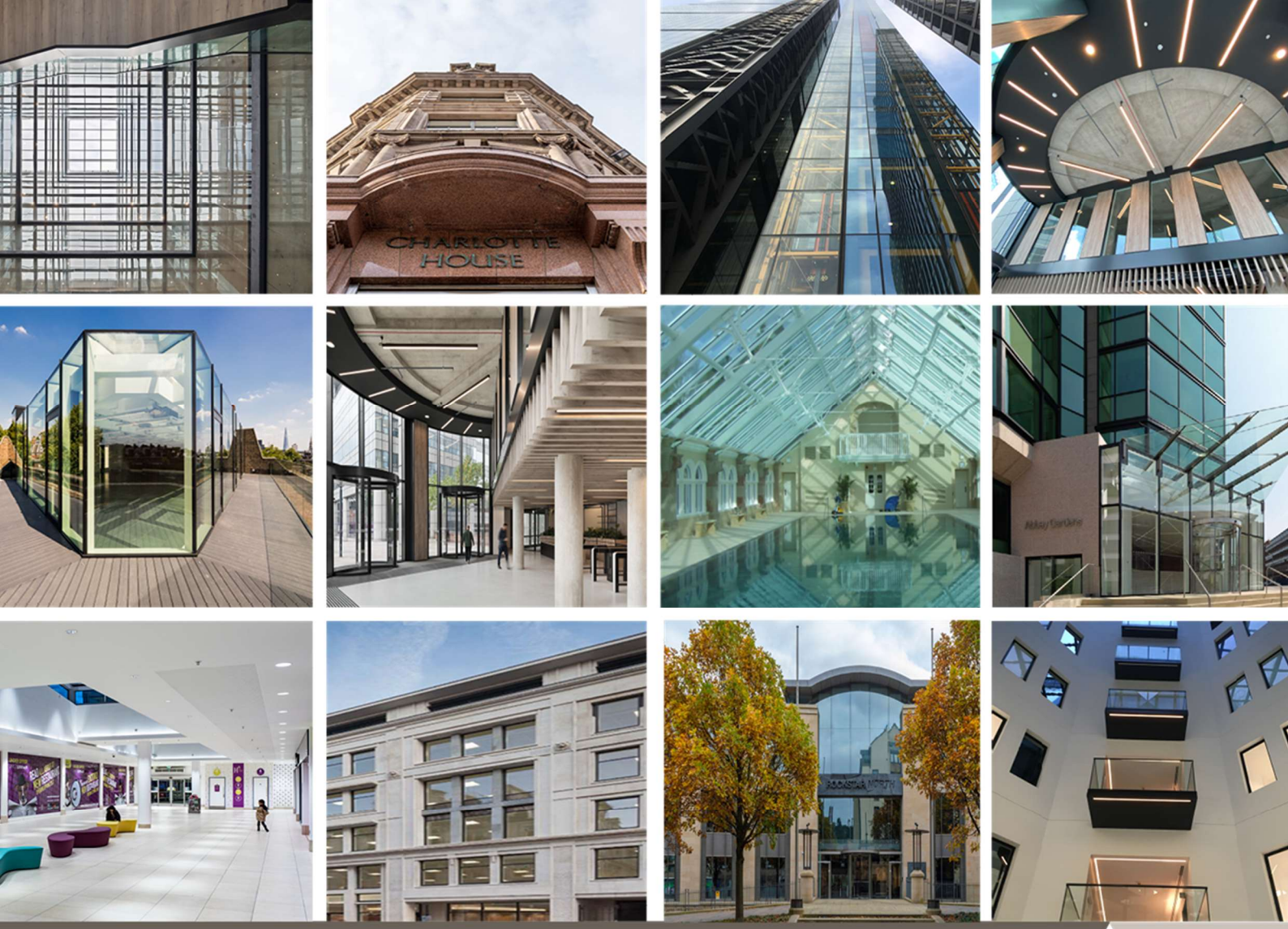

Flood Risk and Drainage Statement

ATP Group

Central Sussex College, Queensmere House

Date of issue: 11/04/2025
Document reference: 0118-ACS-XX-XX-T-C-RP01
Revision: P01

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Document Control

Title:	Flood Risk and Drainage Statement
Client:	ATP Group
Project:	Central Sussex College, Queensmere House
Issue Date:	11/04/2025
Issuing Office:	Birmingham, UK

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Signature 

Date: 11.04.25

Project Manager: Matt Foster

Signature 

Date: 11.04.25

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Reason: I have reviewed this document
Contact Info: GaetanoPellegrino@aciesgroup.co.uk
Date: 2025.04.11 12:20:16+01'00'

Date: 11.04.25

1. Introduction

Acies Civils and Structural Limited has been commissioned by West Sussex County Council to prepare a Flood Risk Assessment and Drainage Strategy for the partial redevelopment of the existing Central Sussex College, Queensmere House.

It is a requirement for planning applications to consider the potential risk of flooding to the proposed development over its expected lifetime and any possible impacts on flood risk elsewhere in terms of its effects on flood flows and runoff. This Flood Risk Assessment has been prepared following guidance set out in the National Planning Policy Framework (NPPF Updated December 2024) and is undertaken in consultation with other relevant bodies.

2. Existing Site

The existing site is located along Queens Road, East Grinstead, and consists of the previous Central Sussex College building and existing parking and landscaping. to the rear of the building.

FIGURE 1 : SITE LOCATION - EAST GRINSTEAD **SOURCE: APPLE MAPS**

2.2 Existing Ground Conditions

At this time there has been no in depth site investigation for this project aside from around of infiltration testing undertaken on site. The BGS data available online indicates that the site is underlain with Ardingly Sandstone Member, however there are no nearby borehole records available to confirm this. Infiltration testing was undertaken on site in July 2019 and this provided an infiltration rate of $2.38x10^{-4}$m/s, which has been utilised for the design on this project.

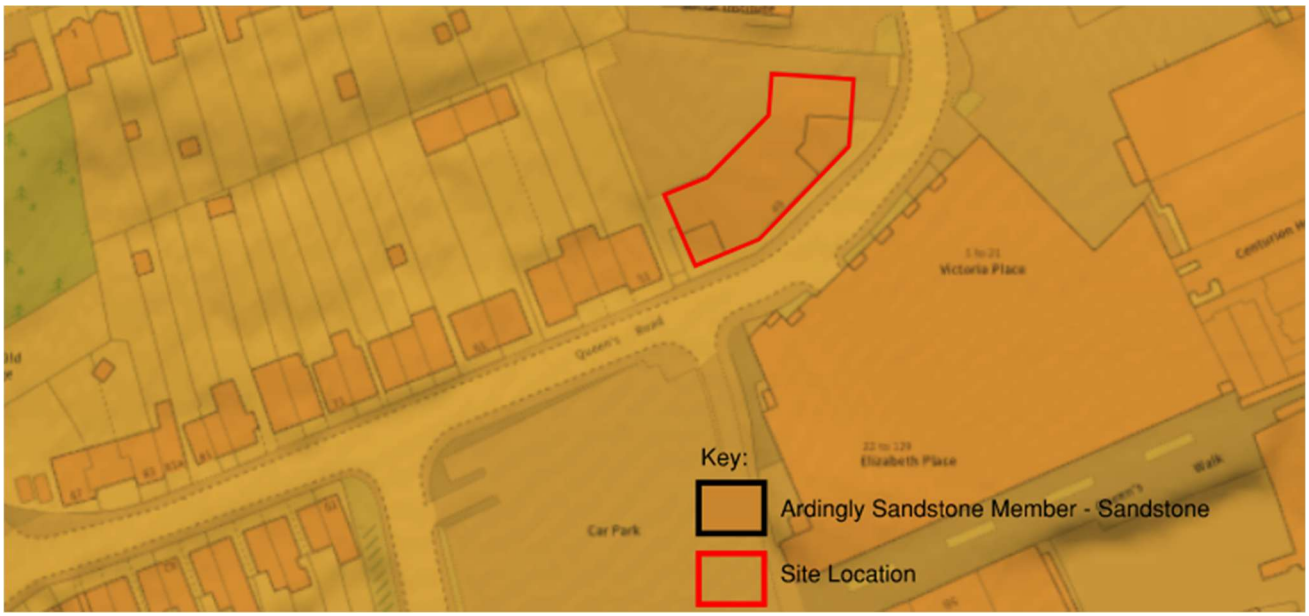


FIGURE 2: BGS MAPPING OF BEDROCK STRATA **SOURCE: BRITISH GEOLOGICAL SURVEY**

2.5 Tidal/Fluvial Flooding

The site is located approximately 760m away from the nearest ordinary water course located South West of the site. The Environment Agency (EA) Flood Map for Planning indicates that the site is situated entirely within Flood Zone 1, meaning that the site is not at risk of fluvial and tidal flooding during a storm with a return period of less than 0.1%AEP. The entire length of Queens Road is also located within Flood Zone 1 and as such it is deemed that there will not be any issues relating to safe access and egress from the site during a 0.1% AEP storm.

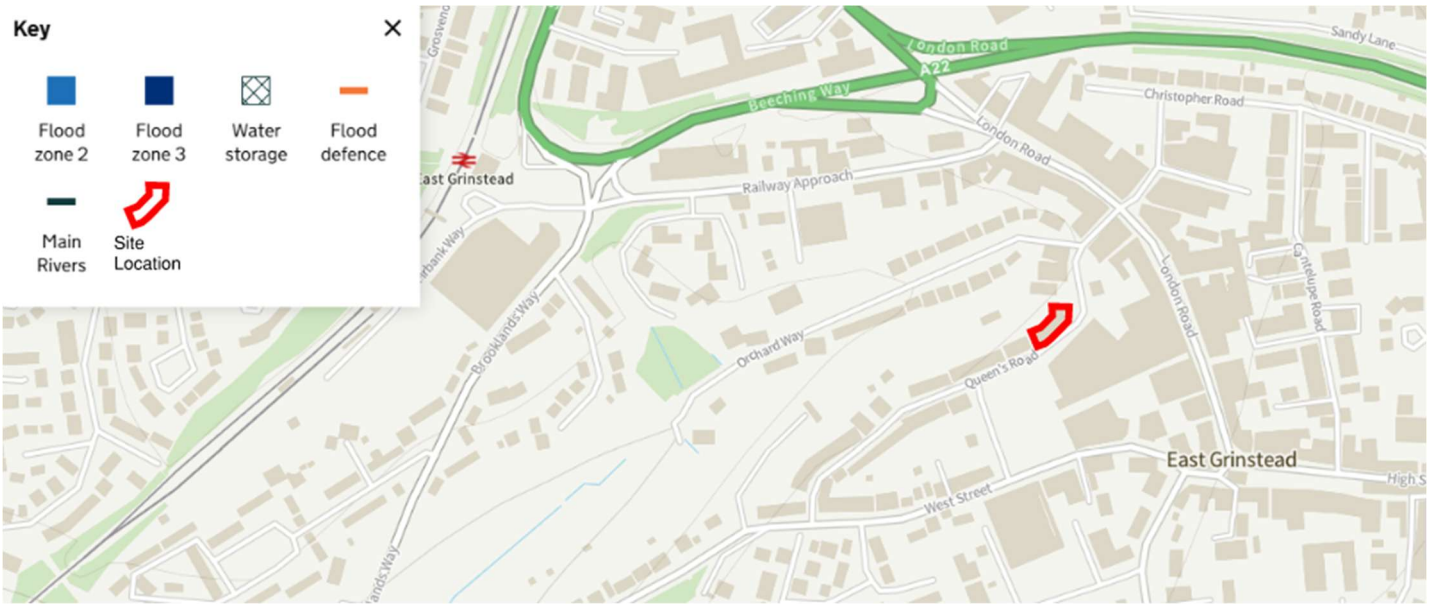


FIGURE 3: EXTRACT FROM ENVIRONMENT AGENCY FLOOD MAP FOR PLANNING. SOURCE: ENVIRONMENT AGENCY

2.6 Surface Water Flooding (Pluvial Flooding)

Surface water flooding can occur when heavy rainfall overwhelms the local drainage network and also depends on existing ground levels, rainfall and the local drainage network. The EA website contains mapping of areas believed vulnerable to surface water flooding. As seen in figure 5 the site does contain a low chance of surface water flooding due to climate change between 2040 and 2060. However, this flooding does not flow onto the site from offsite, and instead pools near to the property. The new drainage system is expected to deal with any surface water flooding originated on site from a 1 in 100 year plus climate change storm event.

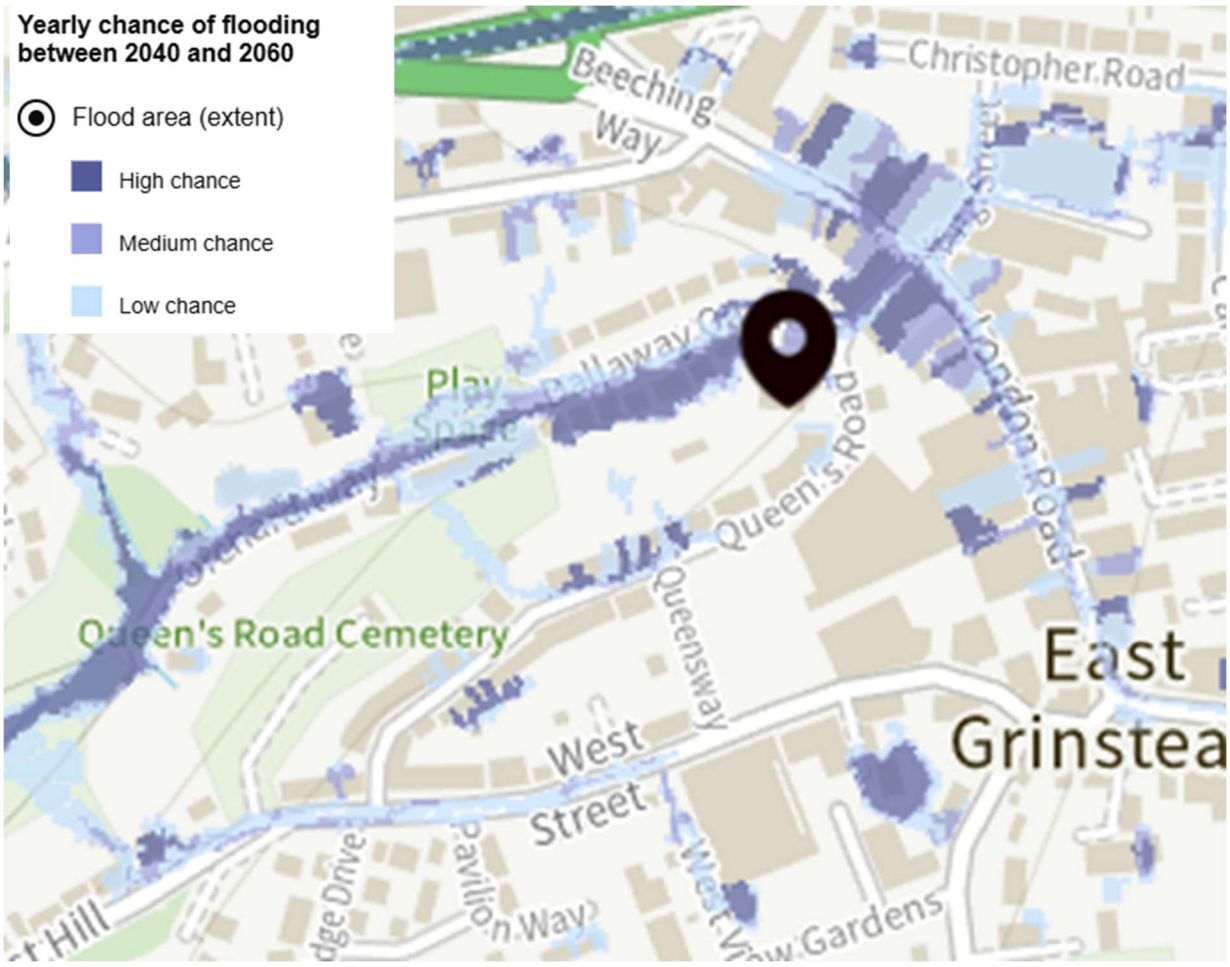


FIGURE 4: EXTRACT FROM ENVIRONMENT AGENCY SURFACE WATER FLOOD RISK MAP

SOURCE: ENVIRONMENT AGENCY

2.7 Artificial Sources of Flooding

The EA long term flood risk service indicates that the site is not at risk of flooding from reservoirs; in addition, there are no other raised water bodies near to the site which could affect it such as canals, ponds etc.

2.8 Groundwater Flooding

The EA long term flood risk summary states that flooding from groundwater is unlikely in this area.

2.9 Historic Flooding

The West Sussex PFRA does not state any historic flooding in East Grinstead, neither does the EA historic flooding map; as such it is assumed that the site has not previously encountered any flooding issues.

2.9 Flood Mitigation

The site is situated in Flood Zone 1 and does not have a significant flood risk from other sources, and as such it is deemed that Flood Mitigation is not required on site, such as an allowance for freeboard from design flood levels to finished floor levels.

3. Proposed Site

The proposed development consists of a change of use of the site from a disused educational building into residential properties, including works to external hard and soft landscaping, and new drainage to a higher standard as required by the LLFA.

4. LLFA Drainage Comments

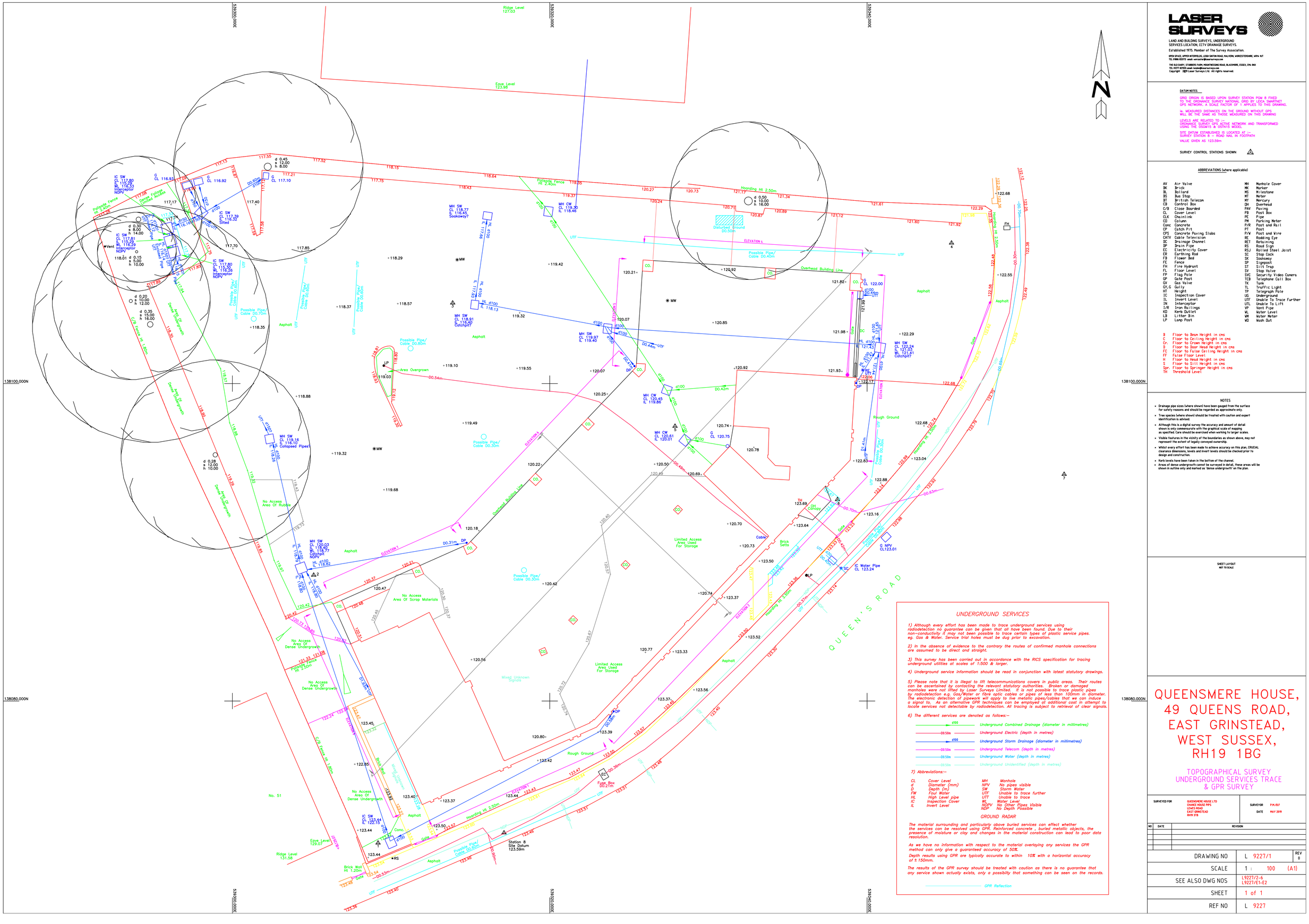
The previously proposed drainage layout has been amended to take into account a number of LLFA comments after the proposal was reviewed by West Sussex County Council LLFA on 03.03.2025. The following section is a series of responses to the comments received, beginning with the comment heading "Include appropriate climate change…" on page 2 of the received comments document.

- *Include appropriate climate change allowance for assessment of the lifetime of the development.*
  - Calculations have been updated to include 50% AEP, 3.33% AEP + 35%CC, and 1%AEP + 45%CC storm return periods. Results of these can be found in Appendix D.
- *Use up to date FEH2022 rainfall data.*
  - All calculations updated to use FEH2022 data.
- *Evidence required on ground conditions.*
  - Infiltration testing has been undertaken on site and the results of this can be found in Appendix B.
- *Greenfield and Brownfield Runoff rates and volumes are missing.*
  - Greenfield runoff rates have been provided now and included within Appendix D. As we're utilising an infiltration drainage design these rates do not affect the requirements of the design.
- *Drawing required showing existing drainage network.*
  - The topographical survey which includes a survey of below ground drainage can be found in Appendix A. The items to be removed are shown on the proposed drainage layout.
- *Drainage survey required to provide evidence of existing discharge rate and condition.*
  - As shown in the survey in Appendix A the site utilises existing soakaways which we are removing and providing a new soakaway to a higher standard. There are no existing surface water connections off site.
- *Evidence why rainwater re-use can't be included.*
  - The proposed development re-utilises the existing structure and much of the internal services, and as such it's not feasible to utilise a greywater system. There is limited soft landscaping on site which would require significant watering, as all proposed rain gardens are to have drought resistant planting, and as such it is not deemed feasible to provide a below ground rainwater harvesting tank which could be utilised for plant watering. At detailed design stage the implementation of water butts will be considered.
- *The application must provide water quantity benefits in open SuDS.*
  - There is limited available space on site due to it already being developed, with existing trees taking up most of the available soft landscaping areas, as such it's not feasible to utilise features such as ponds and swales. However it is proposed to utilise a linear rain garden along the rear elevation, and permeable parking spaces.
- *The application must provide water quality benefits, and water quality assessment*

    - Water quality benefits are provided on site through the linear rain gardens, permeable pavements, and soil beneath the soakaway. A simple index approach assessment has been made in Appendix E, and this shows that the proposed SuDS features provide a suitable level of water quality improvement.
- *The application must provide biodiversity benefits.*
    - As previously discussed there is limited space available on site to provide larger SuDS items such as ponds and swales which would provide significant biodiversity benefits, and the re-use of the existing structure precludes the use of green roofs. However, it is proposed to install a linear rain garden along the rear elevation which will provide biodiversity benefits.
- *The application must provide amenity benefits.*
    - As previously discussed there is limited space available on site to provide larger SuDS items such as ponds and swales which would provide significant amenity benefits, and the re-use of the existing structure precludes the use of green roofs. However, it is proposed to install a linear rain garden along the rear elevation which will provide amenity benefits.
- *Repeat comment. See previous response regarding calculations and climate change allowances.*
- *Repeat comment. See previous response regarding the use of FEH data.*
- *Drawings need to show all drainage features with labels the same as supporting calculations.*
    - The drainage layout has been updated and calculations and labels amended to suit. Please see Appendix C for the proposed drainage layout.
- *Drawings need to show the final design.*
    - Drainage layout has been updated to suit comments, with purpose of issue amended from preliminary to "For Planning", with a status code indicating it is suitable for co-ordination with other consultants past Stage 3.
- *Revised modelling calculations to use a CV value of 1.*
    - Drainage calculations have been updated to utilise a CV of 1.
- *50% AEP storm event does not surcharge the drainage network.*
    - The 50% AEP storm event does not surcharge the drainage network. The only indicated surcharging on the calculations is within the soakaway, with surcharging indicated on a dummy pipe.
- *3.33% AEP rainfall does not flood outside the drainage network.*
    - There is no flooding out of the drainage network in up to a 1%AEP + 45% climate change storm.
- *1% AEP +CC rainfall does not leave site or flood any part of the building etc.*
    - There is no flooding out of the drainage network in up to a 1%AEP + 45% climate change storm.
- *Repeat comment, see previous response regarding climate change allowances etc.*
- *Flooding from the 1% AEP +CC rainfall must be shown on site plan.*
    - There is no flooding out of the drainage network in up to a 1%AEP + 45% climate change storm.
- *Flood resilience measures*
    - As previously discussed there are no design flood events on site as it is located in Flood Zone 1 with a low risk of surface water flooding. The FFLs and threshold levels are set by the existing building.
- *Flood Exceedance plan required for rainfall greater that the 1%AEP +CC event.*
    - Flood exceedance plan for the project can be found in Appendix F.

- *A high level assessment of how water quantity and water quality will be managed during the construction phase is required.*
    - It is proposed for the soakaway to be installed early into the construction phase to remove the need for an offsite connection into the surrounding adopted network. In order to protect this from sediments during construction the chambers prior to the soakaway are to be installed without benching to create a catchpit, which should be regularly emptied during construction, and benching later installed once upstream SuDS features have been implemented. Prior to commissioning of the final drainage it is proposed to jet out all drainage and remove any silts which may have entered into the soakaway.

Appendix A – Topographical and Utilities Survey



LASER SURVEYS

LAND AND BUILDING SURVEYS, UNDERGROUND SERVICES LOCATION, CCTV DRAINAGE SURVEYS.
Established 1975. Member of The Survey Association.
OPUS SPACE, LYPIOS INTERPOLIS, LYDD GATES ROAD, PAUL HEYEN, WORCESTERSHIRE, WR14, 1QT
TEL 01684 833773 email: worcester@lasersurveys.com
THE OLD DAIRY, STUBBINS FARM, MOUNTNESSING ROAD, BLACKMORE, ESSEX, CM4 0NX
TEL 01277 821833 email: london@lasersurveys.com

DATUM NOTES

GRID ORIGIN IS BASED UPON SURVEY STATION PGM 8 FIXED TO THE ORDNANCE SURVEY NATIONAL GRID BY LEICA SMARTNET GPS NETWORK. A SCALE FACTOR OF 1 APPLIES TO THIS DRAWING.

ie. MEASURED DISTANCES ON THE GROUND, WITHOUT GPS WILL BE THE SAME AS THOSE MEASURED ON THIS DRAWING

LEVELS ARE RELATED TO :–
ORDNANCE SURVEY GPS ACTIVE NETWORK AND TRANSFORMED USING THE OSGM15 & OSTN15 MODEL

SITE DATUM ESTABLISHED IS LOCATED AT :–
SURVEY STATION B = ROAD NAIL IN FOOTPATH

VALUE GIVEN AS 123.59m

SURVEY CONTROL STATIONS SHOWN

ABBREVIATIONS (where applicable)

AV	Air Valve	MH	Manhole Cover
BK	Brick	MK	Marker
BL	Bollard	MS	Milestone
BS	Bus Stop	MT	Meter
BT	British Telecom	MY	Mercury
CB	Control Box	OH	Overhead
C/B	Close Boarded	PAV	Paving
CL	Cover Level	PB	Post Box
CLK	Chainlink	PC	Pipe
CO	Column	PM	Parking Meter
Conc	Concrete	P/R	Post and Rail
CP	Catch Pit	PT	Post
CPS	Concrete Paving Slabs	P/W	Post and Wire
CATV	Cable Television	RE	Rodding Eye
DC	Drainage Channel	RET	Retaining
DP	Drain Pipe	RS	Road Sign
EC	Electricity Cover	RSJ	Rolled Steel Joist
ER	Earthing Rod	SC	Stop Cock
FB	Flower Bed	SK	Soakaway
FE	Fence	SP	Signpost
FH	Fire Hydrant	ST	Silt Trap
FL	Floor Level	SV	Stop Valve
FP	Flag Pole	SVC	Security Video Camera
GP	Gate Post	TCB	Telephone Call Box
GV	Gas Valve	TK	Tank
GT,G	Gully	TL	Traffic Light
HT	Height	TP	Telegraph Pole
IC	Inspection Cover	UG	Underground
IL	Invert Level	UTF	Unable To Trace Further
IN	Interceptor	UTL	Unable To Lift
I/R	Iron Railings	VP	Vent Pipe
KO	Kerb Outlet	WL	Water Level
LB	Litter Bin	WM	Water Meter
LP	Lamp Post	WO	Wash Out

B Floor to Beam Height in cms
C Floor to Ceiling Height in cms
Cr Floor to Crown Height in cms
D Floor to Door Head Height in cms
FC Floor to False Ceiling Height in cms
FF Floor Level
H Floor to Head Height in cms
S Floor to Sill Height in cms
Spr Floor to Springer Height in cms
TH Threshold Level

NOTES

- Drainage pipe sizes (where shown) have been gauged from the surface for safety reasons and should be regarded as approximate only.
- Tree species (where shown) should be treated with caution and expert identification is advised.
- Although this is a digital survey the accuracy and amount of detail shown is only commensurate with the graphical scale of mapping as specified. Care should be exercised when working to larger scales.
- Visible features in the vicinity of the boundaries as shown above, may not represent the extent of legally conveyed ownership.
- Whilst every effort has been made to achieve accuracy on this plan, CRUCIAL clearance dimensions, levels and invert levels should be checked prior to design and construction.
- Kerb levels have been taken in the bottom of the channel.
- Areas of dense undergrowth cannot be surveyed in detail, these areas will be shown in outline only and marked as 'dense undergrowth' on the plan.

SHEET LAYOUT
NOT TO SCALE

QUEENSMERE HOUSE, 49 QUEENS ROAD, EAST GRINSTEAD, WEST SUSSEX, RH19 1BG

TOPOGRAPHICAL SURVEY
UNDERGROUND SERVICES TRACE & GPR SURVEY

SURVEYED FOR	QUEENSMERE HOUSE LTD CHANCE HOUSE PIPS LEWES ROAD EAST GRINSTEAD RH19 3TD	SURVEYOR	P.M./B.F
		DATE	MAY 2019

NO	DATE	REVISION

DRAWING NO	L 9227/1	REV 0
SCALE	1 : 100 (A1)	
SEE ALSO DWG NOS	L9227/2-6 L9227/E1-E2	
SHEET	1 of 1	
REF NO	L 9227	

Appendix B – Infiltration Testing

PATRICK PARSONS

BRE DIGEST 365 SOAKAGE TEST CALCULATION

Client:	Valley Builders Ltd	**Test By:**	RH
Project:	Queensmere	**Date / Time:**	09.07.19 11am
Project Code:	A19126	**Weather:**	Sunny

Length of trial pit	=	L_{TP}	=	0.40	m
Width of trial pit	=	W_{TP}	=	0.40	m
Depth of trial pit	=	D	=	0.30	m
Pit Voids	=	PV	=	100	%

(Note - for open pits, PV = 100%. For stone filled pits, PV = 30%)

Water Depth at Start of Test, D_{TP}	=	0.200	m
75% Effective Depth, D_{75}	=	0.225	m
50% Effective Depth, D_{50}	=	0.250	m
25% Effective Depth, D_{25}	=	0.275	m

Time from 75% to 25% effective depth, T_L = 2 mins

Volume of water escaping during this test between D_{75} and D_{25}

= V_{tp}**75-25**

= (L_{TP} x W_{TP} x (D_{25} - D_{75}) x PV) = 0.008 m^3

Mean surface area through which the above volume escapes, is the wetted area.
Only 50% of the effective depth is allowed in the calculation:

Hence: A_{P50} = Wet Base Area + Wet Sides Area (from D_{50} to base of pit)

A_{P50} = (L_{TP} x W_{TP}) + ($2L_{TP}$+$2W_{TP}$) x (D-D_{50})

A_{P50} = 0.16 + 0.080

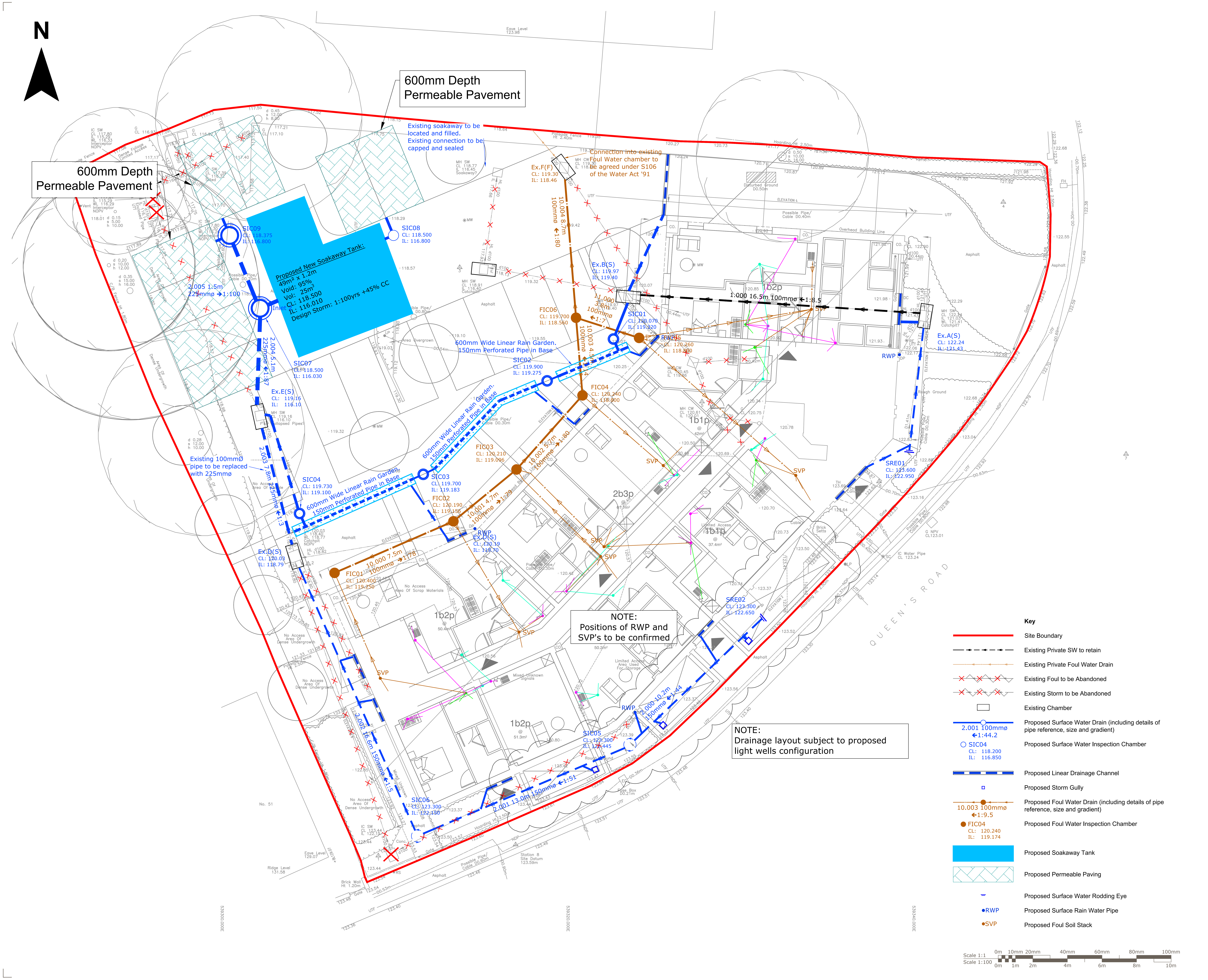
A_{P50} = 0.24 m^2

Soil Infiltration Rate = f = $\frac{V_{TP75-25}}{A_{P50} \times 60 \times T_L}$ m/s

f = $\frac{0.01}{\cdot \times 60 \times 2.3333333333}$ m/s

Soil Infiltration Rate f = 2.38E-04 m/s

Appendix C – Proposed Drainage Layout



NOTES:

1. This drawing is to be read in conjunction with all relevant Architects, Engineers and other specialist details and specifications.
2. Do not scale from this drawing.
3. Drawing issued for preliminary discussions only, further to approval from Planning, Local Authority, Sewerage Undertaker, Environment Agency and any other governing parties. Following receipt of further information and comments the scheme may be revised.
4. Drawing based upon ATP Architects layout drawing: Ref 24152_PL05 Rev A. All setting out is to be based on Architects information unless otherwise stated.
5. Topographical Survey data drawing is from Laser Surveys, Ref: 9227/1 Rev 0, Issue date May 2019. The survey information used in the preparation of this drawing is not warranted. The contractor shall check all dimensions and levels on site.
6. The location and level of all existing services are to be identified prior to construction and the engineer advised of any clashes.
7. All external drainage works shall be constructed in accordance with Sewers for Adoption 6th/7th edition, including demarcation chambers, BS EN 752, together with the Sewerage Undertaker's requirements.
8. Prior to commencing work on the drainage, all existing drains, sewers manholes and outfalls to remain shall be located, identified and a CCTV condition survey carried out. Where necessary, protection to the existing drainage infrastructure shall be provided.
9. For details of manhole types and pipe bedding etc., see standard detail drawing(s).
10. All pipework with less than 1.2m cover in trafficked areas, or less than 0.9m cover in public open space, to have concrete surround or similar protection. The contractor is to protect existing and new buried pipes (particularly shallow pipes) and tree roots from damage caused by loads imposed by construction plant.
11. All concrete to drainage, manholes bases, surrounds etc to be in accordance with the BRE special digest 1 - Concrete in aggressive ground. Refer to site investigation report for sulphate requirements.
12. All pipes shall be clay to BS EN 295 or concrete to BS 5911 unless otherwise stated. Plastic pipes may be used subject to the approval of the Sewerage Undertaker.
13. All abandoned sewers are to be grouted up or removed
14. All manhole and drainage channel covers shall comply with BS EN 124. Manhole covers within block paved areas & buildings shall be recessed.
15. Ventilation shall be provided at the head of foul drainage runs. Access for rodding/jetting shall be provided to all soil and rainwater downpipes above finished floor level.
16. For setting out of soil and rainwater downpipes, see Architect's layout.
17. Cover levels for manholes should be checked with the Architects. Covers should be adjusted to match surrounding finish levels.
18. All pipes within the building footprint to be 100mmØ and laid at a gradient of 1 in 40 unless stated otherwise on this drawing.
19. Soakaway design based on CIRIA C156 Guidance. Soakaways to be located at 5m minimum from any foundation or structure and 2.5m from site boundary.
20. Additional drainage may cross the site and due to change in legislation in October 2011, these former private sewers may now be the responsibility of the Sewerage Undertaker, but not be shown on their records.

Key

- Site Boundary
- Existing Private SW to retain
- Existing Private Foul Water Drain
- Existing Foul to be Abandoned
- Existing Storm to be Abandoned
- Existing Chamber
- 2.001 100mmø ←1:44.2 — Proposed Surface Water Drain (including details of pipe reference, size and gradient)
- SIC04 CL: 118.200 IL: 116.850 — Proposed Surface Water Inspection Chamber
- Proposed Linear Drainage Channel
- Proposed Storm Gully
- 10.003 100mmø ←1:9.5 — Proposed Foul Water Drain (including details of pipe reference, size and gradient)
- FIC04 CL: 120.240 IL: 119.174 — Proposed Foul Water Inspection Chamber
- Proposed Soakaway Tank
- Proposed Permeable Paving
- Proposed Surface Water Rodding Eye
- RWP — Proposed Surface Rain Water Pipe
- SVP — Proposed Foul Soil Stack

Scale 1:1 0m 10mm 20mm 40mm 60mm 80mm 100mm
Scale 1:100 0m 1m 2m 4m 6m 8m 10m

Rev	Description	By	Chk	App	Date
P02	Updated to suit LLFA comments	BS	MF	GP	11.04.25
P01	First Issue	BS	MF	GP	18.12.24

Purpose of Issue : **For Planning**
Status Code : **S3**

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Project : **Queensmere House**
East Grinstead

Drawing : **Proposed Drainage Strategy**

Acies Job No : **3470118**
Scale @ A1 : **1:100**

Drawing No : **0118-ACS-XX-XX-DP-9200**
Rev : **P02**

Appendix D – Surface Water Drainage Calculations

Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	2	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)	20.000	Minimum Backdrop Height (m)	0.200
Ratio-R	0.400	Preferred Cover Depth (m)	1.200
CV	0.750	Include Intermediate Ground	✓
Time of Entry (mins)	5.00	Enforce best practice design rules	x

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Width (mm)	Easting (m)	Northing (m)	Depth (m)
Ex.A(S)	0.017	5.00	122.240	900	675	539340.814	138102.260	0.810
Ex.B(S)	0.023	5.00	119.970	900	675	539323.633	138103.371	0.620
Ex.D(S)	0.016	5.00	120.030	900	675	539304.347	138088.377	1.240
Ex.E(S)			119.160	900	675	539302.302	138096.456	3.060
SRE01	0.003	5.00	123.600	150		539339.887	138094.498	0.650
SRE02	0.018	5.00	123.300	150		539331.368	138084.767	0.650
SIC05	0.003	5.00	123.300	675		539323.729	138077.477	0.888
SIC06	0.007	5.00	123.300	675		539311.450	138072.197	1.150
SIC07			118.500	900		539301.737	138102.531	2.470
SIC08	0.019	5.00	118.500	675		539310.058	138106.929	1.700
SIC09	0.022	5.00	118.375	900		539300.253	138106.871	1.575
Inlet2			118.500	1		539303.418	138103.175	2.475
Skwy			118.500	2100		539306.686	138104.428	2.490
SIC01	0.019	5.00	120.070	450		539322.777	138100.938	0.750
SIC02	0.006	5.00	119.900	450		539318.942	138098.519	0.625
SIC03	0.005	5.00	119.700	450		539311.780	138093.113	0.517
SIC04	0.004	5.00	119.730	450		539304.625	138090.845	0.630
Dummy Outfall			119.730	100		539305.525	138106.134	3.230

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	SRE01	Ex.A(S)	7.817	0.600	122.950	121.430	1.520	5.1	100	5.04	50.0
1.001	Ex.A(S)	Ex.B(S)	17.217	0.600	121.430	119.400	2.030	8.5	100	5.15	50.0
2.000	SRE02	SIC05	10.559	0.600	122.650	122.412	0.238	44.4	150	5.12	50.0
2.001	SIC05	SIC06	13.366	0.600	122.412	122.150	0.262	51.0	150	5.27	50.0
2.002	SIC06	Ex.D(S)	17.670	0.600	122.150	118.865	3.285	5.4	150	5.34	50.0
2.003	Ex.D(S)	Ex.E(S)	8.334	0.600	118.790	116.100	2.690	3.1	225	5.36	50.0
2.004	Ex.E(S)	SIC07	6.101	0.600	116.100	116.030	0.070	87.2	225	5.52	50.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)
1.000	3.433	27.0	0.4	0.550	0.710	0.003	0.0
1.001	2.670	21.0	2.7	0.710	0.470	0.020	0.0
2.000	1.515	26.8	2.4	0.500	0.738	0.018	0.0
2.001	1.412	24.9	2.8	0.738	1.000	0.021	0.0
2.002	4.374	77.3	3.8	1.000	1.015	0.028	0.0
2.003	7.487	297.7	6.0	1.015	2.835	0.044	0.0
2.004	1.401	55.7	16.4	2.835	2.245	0.121	0.0

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)
2.005	SIC07	Inlet2	1.800	0.600	116.030	116.025	0.005	360.0	225	5.57	50.0
2.007	Inlet2	Skwy	3.500	0.600	116.025	116.010	0.015	233.3	300	5.62	50.0
3.000	SIC08	Skwy	4.198	0.600	116.800	116.025	0.775	5.4	150	5.02	50.0
4.000	SIC09	SIC07	4.587	0.600	116.800	116.105	0.695	6.6	225	5.01	50.0
1.002	Ex.B(S)	SIC01	2.579	0.600	119.350	119.320	0.030	86.0	225	5.18	50.0
1.003	SIC01	SIC02	4.534	0.600	119.320	119.275	0.045	100.8	225	5.23	50.0
1.004	SIC02	SIC03	8.973	0.600	119.275	119.183	0.092	97.5	225	5.35	50.0
1.005	SIC03	SIC04	7.506	0.600	119.183	119.100	0.083	90.4	225	5.44	50.0
1.006	SIC04	Ex.E(S)	6.073	0.600	119.100	116.175	2.925	2.1	225	5.45	50.0
1.010	Skwy	Dummy Outfall	2.064	0.600	116.010	116.500	-0.490	-4.2	100	5.66	50.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)
2.005	0.683	27.2	19.4	2.245	2.250	0.143	0.0
2.007	1.025	72.4	19.4	2.175	2.190	0.143	0.0
3.000	4.358	77.0	2.6	1.550	2.325	0.019	0.0
4.000	5.126	203.8	3.0	1.350	2.170	0.022	0.0
1.002	1.411	56.1	5.8	0.395	0.525	0.043	0.0
1.003	1.302	51.8	8.4	0.525	0.400	0.062	0.0
1.004	1.324	52.6	9.2	0.400	0.292	0.068	0.0
1.005	1.375	54.7	9.9	0.292	0.405	0.073	0.0
1.006	9.149	363.8	10.4	0.405	2.760	0.077	0.0
1.010	1.000	7.9	22.0	2.390	3.130	0.162	0.0

Simulation Settings

Rainfall Methodology	FEH-22	Analysis Speed	Detailed	Additional Storage (m³/ha)	0.0
Summer CV	1.000	Skip Steady State	x	Check Discharge Rate(s)	x
Winter CV	1.000	Drain Down Time (mins)	240	Check Discharge Volume	x

Storm Durations

15	30	60	120	180	240	360	480	600	720	960	1440	2160

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
2	0	0	0
30	35	0	0
100	45	0	0

Node Dummy Outfall Online Orifice Control

Flap Valve	x	Invert Level (m)	116.500	Discharge Coefficient	0.600
Replaces Downstream Link	✓	Diameter (m)	0.001		

Node Skwy Soakaway Storage Structure

Base Inf Coefficient (m/hr)	0.85680	Invert Level (m)	116.010	Depth (m)	1.200
Side Inf Coefficient (m/hr)	0.85680	Time to half empty (mins)	104	Inf Depth (m)	1.200
Safety Factor	2.0	Pit Width (m)	10.000	Number Required	1
Porosity	0.95	Pit Length (m)	4.900		

Node SIC02 Soakaway Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	119.275	Depth (m)	
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	3	Inf Depth (m)	
Safety Factor	2.0	Pit Width (m)	0.600	Number Required	1
Porosity	0.30	Pit Length (m)	4.424		

Node SIC03 Soakaway Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	119.183	Depth (m)	
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	4	Inf Depth (m)	
Safety Factor	2.0	Pit Width (m)	0.600	Number Required	1
Porosity	0.30	Pit Length (m)	7.911		

Node SIC04 Soakaway Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	119.100	Depth (m)	
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	0	Inf Depth (m)	
Safety Factor	2.0	Pit Width (m)	0.600	Number Required	1
Porosity	0.30	Pit Length (m)	7.582		

Results for 2 year Critical Storm Duration. Lowest mass balance: 99.83%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	Ex.A(S)	10	121.459	0.029	3.6	0.0174	0.0000	OK
15 minute summer	Ex.B(S)	10	119.421	0.071	7.8	0.0434	0.0000	OK
15 minute summer	Ex.D(S)	10	118.815	0.025	7.9	0.0152	0.0000	OK
15 minute summer	Ex.E(S)	11	116.220	0.120	21.5	0.0729	0.0000	OK
15 minute summer	SRE01	11	122.960	0.010	0.5	0.0002	0.0000	OK
15 minute summer	SRE02	10	122.686	0.035	3.3	0.0006	0.0000	OK
15 minute summer	SIC05	10	122.455	0.043	3.8	0.0154	0.0000	OK
15 minute summer	SIC06	10	122.176	0.026	5.0	0.0094	0.0000	OK
15 minute summer	SIC07	12	116.188	0.158	25.4	0.1002	0.0000	OK
15 minute summer	SIC08	10	116.822	0.022	3.5	0.0078	0.0000	OK
15 minute summer	SIC09	10	116.822	0.022	4.0	0.0139	0.0000	OK
30 minute summer	Inlet2	24	116.185	0.160	22.9	0.0000	0.0000	OK
30 minute summer	Skwy	25	116.185	0.175	25.7	8.7395	0.0000	SURCHARGED
15 minute summer	SIC01	10	119.401	0.081	11.2	0.0129	0.0000	OK
15 minute summer	SIC02	10	119.355	0.080	12.3	0.0763	0.0000	OK
15 minute summer	SIC03	11	119.270	0.087	13.1	0.1379	0.0000	OK
15 minute summer	SIC04	11	119.129	0.029	13.7	0.0442	0.0000	OK
15 minute summer	Dummy Outfall	1	116.500	0.000	0.0	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	Ex.A(S)	1.001	Ex.B(S)	3.6	1.969	0.171	0.0313	
15 minute summer	Ex.B(S)	1.002	SIC01	7.7	0.654	0.138	0.0306	
15 minute summer	Ex.D(S)	2.003	Ex.E(S)	7.8	1.224	0.026	0.0994	
15 minute summer	Ex.E(S)	2.004	SIC07	21.6	0.867	0.388	0.1524	
15 minute summer	SRE01	1.000	Ex.A(S)	0.5	0.488	0.019	0.0087	
15 minute summer	SRE02	2.000	SIC05	3.3	0.894	0.122	0.0387	
15 minute summer	SIC05	2.001	SIC06	3.7	1.212	0.149	0.0416	
15 minute summer	SIC06	2.002	Ex.D(S)	5.0	2.436	0.064	0.0360	
15 minute summer	SIC07	2.005	Inlet2	25.1	1.015	0.925	0.0488	
15 minute summer	SIC08	3.000	Skwy	3.5	1.968	0.045	0.0375	
15 minute summer	SIC09	4.000	SIC07	4.0	1.564	0.020	0.0340	
30 minute summer	Inlet2	2.007	Skwy	22.6	1.195	0.312	0.1414	
30 minute summer	Skwy	1.010	Dummy Outfall	0.0	0.000	0.000	0.0081	
30 minute summer	Skwy	Infiltration		6.5				
15 minute summer	SIC01	1.003	SIC02	11.2	0.876	0.216	0.0578	
15 minute summer	SIC02	1.004	SIC03	12.2	0.910	0.231	0.1201	
15 minute summer	SIC03	1.005	SIC04	13.0	1.610	0.238	0.0644	
15 minute summer	SIC04	1.006	Ex.E(S)	13.8	3.914	0.038	0.0261	
15 minute summer	Dummy Outfall	Orifice		0.0				0.0

Results for 30 year +35% CC Critical Storm Duration. Lowest mass balance: 99.83%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	Ex.A(S)	10	121.487	0.057	12.9	0.0345	0.0000	OK
15 minute summer	Ex.B(S)	10	119.539	0.189	27.7	0.1149	0.0000	OK
15 minute summer	Ex.D(S)	10	118.836	0.046	28.3	0.0280	0.0000	OK
60 minute winter	Ex.E(S)	56	116.958	0.858	39.3	0.5219	0.0000	SURCHARGED
15 minute summer	SRE01	10	122.968	0.018	1.9	0.0003	0.0000	OK
15 minute summer	SRE02	10	122.722	0.072	11.7	0.0013	0.0000	OK
15 minute summer	SIC05	10	122.501	0.089	13.5	0.0317	0.0000	OK
15 minute summer	SIC06	10	122.201	0.051	17.9	0.0182	0.0000	OK
60 minute winter	SIC07	57	116.957	0.927	44.9	0.5893	0.0000	SURCHARGED
60 minute winter	SIC08	57	116.955	0.155	6.2	0.0554	0.0000	SURCHARGED
60 minute winter	SIC09	57	116.957	0.157	7.1	0.0996	0.0000	OK
60 minute winter	Inlet2	57	116.955	0.930	43.9	0.0000	0.0000	SURCHARGED
60 minute winter	Skwy	57	116.955	0.944	49.3	47.2374	0.0000	SURCHARGED
15 minute summer	SIC01	10	119.521	0.201	39.7	0.0320	0.0000	OK
15 minute summer	SIC02	10	119.466	0.191	43.4	0.1822	0.0000	OK
15 minute summer	SIC03	11	119.371	0.188	46.2	0.2978	0.0000	OK
15 minute summer	SIC04	11	119.154	0.054	48.7	0.0819	0.0000	OK
60 minute winter	Dummy Outfall	57	116.955	0.455	1.2	0.0036	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	Ex.A(S)	1.001	Ex.B(S)	12.9	2.037	0.613	0.1068	
15 minute summer	Ex.B(S)	1.002	SIC01	27.5	0.755	0.489	0.0942	
15 minute summer	Ex.D(S)	2.003	Ex.E(S)	28.2	1.108	0.095	0.1900	
60 minute winter	Ex.E(S)	2.004	SIC07	37.8	0.952	0.679	0.2426	
15 minute summer	SRE01	1.000	Ex.A(S)	1.9	0.727	0.070	0.0217	
15 minute summer	SRE02	2.000	SIC05	11.6	1.210	0.435	0.1015	
15 minute summer	SIC05	2.001	SIC06	13.4	1.679	0.539	0.1074	
15 minute summer	SIC06	2.002	Ex.D(S)	17.9	3.491	0.231	0.0905	
60 minute winter	SIC07	2.005	Inlet2	43.9	1.105	1.617	0.0716	
60 minute winter	SIC08	3.000	Skwy	6.2	1.536	0.080	0.0739	
60 minute winter	SIC09	4.000	SIC07	7.1	1.472	0.035	0.1588	
60 minute winter	Inlet2	2.007	Skwy	43.1	1.202	0.595	0.2465	
60 minute winter	Skwy	1.010	Dummy Outfall	1.2	0.223	0.159	0.0161	
60 minute winter	Skwy	Infiltration		9.2				
15 minute summer	SIC01	1.003	SIC02	39.5	1.075	0.762	0.1663	
15 minute summer	SIC02	1.004	SIC03	43.0	1.208	0.818	0.3198	
15 minute summer	SIC03	1.005	SIC04	46.2	2.127	0.845	0.1604	
15 minute summer	SIC04	1.006	Ex.E(S)	48.8	3.804	0.134	0.1428	
60 minute winter	Dummy Outfall	Orifice		0.0				0.0

Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 99.83%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	Ex.A(S)	10	121.501	0.071	17.7	0.0433	0.0000	OK
15 minute summer	Ex.B(S)	11	119.773	0.423	37.8	0.2572	0.0000	FLOOD RISK
15 minute summer	Ex.D(S)	10	118.844	0.054	38.6	0.0328	0.0000	OK
60 minute winter	Ex.E(S)	59	118.362	2.262	54.1	1.3751	0.0000	SURCHARGED
15 minute summer	SRE01	10	122.971	0.021	2.7	0.0004	0.0000	OK
15 minute summer	SRE02	10	122.739	0.089	15.9	0.0016	0.0000	OK
15 minute summer	SIC05	10	122.522	0.110	18.5	0.0393	0.0000	OK
15 minute summer	SIC06	10	122.210	0.060	24.5	0.0216	0.0000	OK
60 minute winter	SIC07	59	118.359	2.329	61.3	1.4814	0.0000	FLOOD RISK
60 minute winter	SIC08	60	118.357	1.557	8.5	0.5573	0.0000	FLOOD RISK
60 minute winter	SIC09	59	118.359	1.559	9.9	0.9917	0.0000	FLOOD RISK
60 minute winter	Inlet2	59	118.357	2.332	59.8	0.0000	0.0000	FLOOD RISK
60 minute winter	Skwy	60	118.357	2.347	67.1	64.0120	0.0000	FLOOD RISK
15 minute summer	SIC01	11	119.739	0.419	52.8	0.0666	0.0000	SURCHARGED
15 minute summer	SIC02	11	119.646	0.371	57.5	0.3546	0.0000	FLOOD RISK
15 minute summer	SIC03	11	119.479	0.296	61.6	0.4679	0.0000	FLOOD RISK
15 minute summer	SIC04	11	119.162	0.062	64.9	0.0947	0.0000	OK
60 minute winter	Dummy Outfall	60	118.357	1.857	3.6	0.0149	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	Ex.A(S)	1.001	Ex.B(S)	17.5	2.345	0.834	0.1187	
15 minute summer	Ex.B(S)	1.002	SIC01	36.4	0.914	0.648	0.1026	
15 minute summer	Ex.D(S)	2.003	Ex.E(S)	38.6	1.363	0.130	0.1961	
60 minute winter	Ex.E(S)	2.004	SIC07	52.2	1.312	0.937	0.2426	
15 minute summer	SRE01	1.000	Ex.A(S)	2.7	0.758	0.099	0.0281	
15 minute summer	SRE02	2.000	SIC05	15.8	1.278	0.591	0.1303	
15 minute summer	SIC05	2.001	SIC06	18.3	1.779	0.735	0.1367	
15 minute summer	SIC06	2.002	Ex.D(S)	24.4	3.790	0.316	0.1138	
60 minute winter	SIC07	2.005	Inlet2	59.8	1.504	2.202	0.0716	
60 minute winter	SIC08	3.000	Skwy	8.5	1.675	0.110	0.0739	
60 minute winter	SIC09	4.000	SIC07	9.9	1.496	0.049	0.1824	
60 minute winter	Inlet2	2.007	Skwy	58.6	1.286	0.809	0.2465	
60 minute winter	Skwy	1.010	Dummy Outfall	3.6	0.461	0.459	0.0161	
60 minute winter	Skwy	Infiltration		10.1				
15 minute summer	SIC01	1.003	SIC02	52.4	1.317	1.011	0.1803	
15 minute summer	SIC02	1.004	SIC03	57.4	1.444	1.091	0.3569	
15 minute summer	SIC03	1.005	SIC04	61.5	2.168	1.124	0.1827	
15 minute summer	SIC04	1.006	Ex.E(S)	64.7	3.747	0.178	0.1478	
60 minute winter	Dummy Outfall	Orifice		0.0				0.0

Appendix E – Simple Index Approach to Water Quality Management Assessment

Pollution hazard indices for different land use classifications

Land Use	Pollution Hazard Level	Total Suspended Solids (TSS)	Metals	Hydrocarbons
Residential roofs	Very Low	0.2	0.2	0.05
Other roofs (typically commercial/ industrial roofs)	Low	0.3	0.2 (up to 0.8 where there is potential for metals to leach from the roof)	0.05
Individual property driveways, residential car parks, low traffic roads (eg cul de sacs, homezones and general access roads) and non-residential car parking with infrequent change (eg schools, offices) ie < 300 traffic movements/day	Low	0.5	0.4	0.4
Commercial yard and delivery areas, non-residential car parking with frequent change (eg hospitals, retail), all roads except low traffic roads and trunk roads/motorways[1]	Medium	0.7	0.6	0.7
Sites with heavy pollution (eg haulage yards, lorry parks, highly frequented lorry approaches to industrial estates, waste sites), sites where chemicals and fuels (other than domestic fuel oil) are to be delivered, handled, stored, used or manufactured; industrial sites; trunk roads and motorways[1]	High	0.8[2]	0.8[2]	0.9[2]

Notes

1 Motorways and trunk roads should follow the guidance and risk assessment process set out in Highways Agency (2009).

2 These should only be used if considered appropriate as part of a detailed risk assessment – required for all these land use types. When dealing with high hazard sites, the environmental regulator should first be consulted for pre-permitting advice. This will help determine the most appropriate approach to the development of a design solution.

Indicative SuDS mitigation indices for discharges to surface waters

	Mitigation Indices		
SuDS Component	**TSS**	**Metals**	**Hydrocarbons**
Filter Strip	0.4	0.4	0.5
Filter Drain	0.4[2]	0.4	0.4
Swale	0.5	0.6	0.6
Green Roof	0.8	0.7	0.9
Bioretention System	0.8	0.8	0.8
Permeable Pavement	0.7	0.6	0.7
Detention Basin	0.5	0.5	0.6
Pond[4]	0.7[3]	0.7	0.5
Wetland	0.8[3]	0.8	0.8
Proprietary Treatment Systems[5,6]	These must demonstrate that they can address each of the contaminant types to acceptable levels for frequent events up to approximately the 1 in 1 year return period event, for inflow concentrations relevant to the contributing drainage area.		

Notes

1 SuDS components only deliver these indices if they follow design guidance with respect to hydraulics and treatment set out in the relevant technical component chapters.

2 Filter drains can remove coarse sediments, but their use for this purpose will have significant implications with respect to maintenance requirements, and this should be taken into account in the design and Maintenance Plan.

3 Ponds and wetlands can remove coarse sediments, but their use for this purpose will have significant implications with respect to the maintenance requirements and amenity value of the system. Sediment should normally be removed upstream, unless they are specifically designed to retain sediment in a separate part of the component, where it cannot easily migrate to the main body of water.

4 Where a wetland is not specifically designed to provide significantly enhanced treatment, it should be considered as having the same mitigation indices as a pond.

5 See SuDS Manual **Chapter 14** for approaches to demonstrate product performance. A British Water/Environment Agency assessment code of practice is currently under development that will allow manufacturers to complete an agreed test protocol for systems intended to treat contaminated surface water runoff. Full details can be found at: **http://tinyurl.com/qf7yuj7**

6 SEPA only considers proprietary treatment systems as appropriate in exceptional circumstances where other types of SuDS component are not practicable. Proprietary treatment systems may also be considered appropriate for existing sites that are causing pollution where there is a requirement to retrofit treatment. SEPA (2014) also provides a flowchart with a summary of checks on suitability of a proprietary system.

Indicative SuDS mitigation indices for discharges to groundwater

	Mitigation Indices		
Characteristics of the material overlying the proposed infiltration surface, through which the runoff percolates[1]	**TSS**	**Metals**	**Hydrocarbons**
A layer of dense vegetation underlain by a soil with good contaminant attenuation potential[2] of at least 300 mm in depth[3].	0.6[4]	0.5	0.6
A soil with good contaminant attenuation potential[2] of at least 300 mm in depth[3]	0.4[4]	0.3	0.3
Infiltration trench (where a suitable depth of filtration material is included that provides treatment, i.e. graded gravel with sufficient smaller particles but not single size coarse aggregate such as 20mm gravel) underlain by a soil with good contaminant attenuation potential[2] of at least 300 mm in depth[3].	0.4[4]	0.4	0.4
Constructed permeable pavement (where a suitable filtration layer is included that provides treatment, and including a geotextile at the base separating the foundation from the subgrade) underlain by a soil with good contaminant attenuation potential[2] of at least 300 mm in depth[3]	0.7	0.6	0.7
Bioretention underlain by a soil with good contaminant attenuation potential[2] of at least 300 mm in depth[3]	0.8[4]	0.8	0.8
Proprietary treatment systems[5, 6]	These must demonstrate that they can address each of the contaminant types to acceptable levels for inflow concentrations relevant to the contributing drainage area.		

Notes

1 All designs must include a minimum of 1 m unsaturated depth of aquifer material between the infiltration surface and the maximum likely groundwater level (as required in infiltration design – SuDS Manual Chapter 25).

2 For example as recommended in Sniffer (2008a and 2008b), Scott Wilson (2010) or other appropriate guidance.

3 Alternative depths may be considered where it can be demonstrated that the combination of the proposed depth and soil characteristics will provide equivalent protection to the underlying groundwater – see note 1.

4 If significant volumes of sediment are allowed to enter an infiltration system, there will be a high risk of rapid clogging and subsequent system failure.

5 See SuDS Manual **Chapter 14** for approaches to demonstrate product performance. Note: a British Water/Environment Agency assessment code of practice is currently under development that will allow manufacturers to complete an agreed test protocol for systems intended to treat contaminated surface water runoff. Full details can be found at: **www.britishwater.co.uk/Publications/codes-of-practise.aspx**

6 SEPA only considers proprietary treatment systems as appropriate in exceptional circumstances where other types of SuDS component are not practicable. Proprietary treatment systems may also be considered appropriate for existing sites that are causing pollution, where there is a requirement to retrofit treatment. WAT-RM-08 (SEPA, 2014) also provides a flowchart with a summary of checks on suitability of a proprietary system.

Access Road (Ex.B to Soakaway)

Pollution Hazard Index

Land Usage	TSS	Metals	Hydrocarbons
Low Traffic Road	0.5	0.4	0.4
Residential Roof	0.2	0.2	0.05
Total	**0.7**	**0.6**	**0.45**

SuDS Mitigation Index

SuDS Feature	TSS	Metals	Hydrocarbons
Bioretention System	0.8	0.8	0.8
A soil with good contaminant attenuation potential of at least 300 mm in depth / 2	0.2	0.15	0.15
Total	**1.0**	**0.95**	**0.95**

SuDS Mitigation Index > Pollution Hazard Index in all cases

Southern Drainage Run (SRE02 to Soakaway)

Pollution Hazard Index

Land Usage	TSS	Metals	Hydrocarbons
Residential Roof	0.2	0.2	0.05
Total	**0.2**	**0.2**	**0.05**

SuDS Mitigation Index

SuDS Feature	TSS	Metals	Hydrocarbons
A soil with good contaminant attenuation potential[2] of at least 300 mm in depth	0.4	0.3	0.3
Total	**0.4**	**0.3**	**0.3**

SuDS Mitigation Index > Pollution Hazard Index in all cases

Car Parking Area

Pollution Hazard Index

Land Usage	TSS	Metals	Hydrocarbons
Residential Car Parking	0.5	0.4	0.4
Total	**0.5**	**0.4**	**0.4**

SuDS Mitigation Index

SuDS Feature	TSS	Metals	Hydrocarbons
Permeable Pavement	0.7	0.6	0.7
A soil with good contaminant attenuation potential of at least 300 mm in depth / 2	0.2	0.15	0.15
Total	**0.9**	**0.75**	**0.85**

SuDS Mitigation Index > Pollution Hazard Index in all cases

Appendix F – Flood Exceedance Plan

NOTES:

1. This drawing is to be read in conjunction with all relevant Architects, Engineers and other specialist details and specifications.
2. Do not scale from this drawing.
3. Drawing issued for preliminary discussions only, further to approval from Planning, Local Authority, Sewerage Undertaker, Environment Agency and any other governing parties. Following receipt of further information and comments the scheme may be revised.
4. Drawing based upon ATP Architects layout drawing: Ref 24152_PL05 Rev A. All setting out is to be based on Architects information unless otherwise stated.
5. Topographical Survey data drawing is from Laser Surveys, Ref: 9227/1 Rev 0, Issue date May 2019. The survey information used in the preparation of this drawing is not warranted. The contractor shall check all dimensions and levels on site.
6. The location and level of all existing services are to be identified prior to construction and the engineer advised of any clashes.
7. All external drainage works shall be constructed in accordance with Sewers for Adoption 6th/7th edition, including demarcation chambers, BS EN 752, together with the Sewerage Undertaker's requirements.
8. Prior to commencing work on the drainage, all existing drains, sewers manholes and outfalls to remain shall be located, identified and a CCTV condition survey carried out. Where necessary, protection to the existing drainage infrastructure shall be provided.
9. For details of manhole types and pipe bedding etc., see standard detail drawing(s).
10. All pipework with less than 1.2m cover in trafficked areas, or less than 0.9m cover in public open space, to have concrete surround or similar protection. The contractor is to protect existing and new buried pipes (particularly shallow pipes) and tree roots from damage caused by loads imposed by construction plant.
11. All concrete to drainage, manholes bases, surrounds etc to be in accordance with the BRE special digest 1 - Concrete in aggressive ground. Refer to site investigation report for sulphate requirements.
12. All pipes shall be clay to BS EN 295 or concrete to BS 5911 unless otherwise stated. Plastic pipes may be used subject to the approval of the Sewerage Undertaker.
13. All abandoned sewers are to be grouted up or removed
14. All manhole and drainage channel covers shall comply with BS EN 124. Manhole covers within block paved areas & buildings shall be recessed.
15. Ventilation shall be provided at the head of foul drainage runs. Access for rodding/jetting shall be provided to all soil and rainwater downpipes above finished floor level.
16. For setting out of soil and rainwater downpipes, see Architect's layout.
17. Cover levels for manholes should be checked with the Architects. Covers should be adjusted to match surrounding finish levels.
18. All pipes within the building footprint to be 100mmØ and laid at a gradient of 1 in 40 unless stated otherwise on this drawing.
19. Soakaway design based on CIRIA C156 Guidance. Soakaways to be located at 5m minimum from any foundation or structure and 2.5m from site boundary.
20. Additional drainage may cross the site and due to change in legislation in October 2011, these former private sewers may now be the responsibility of the Sewerage Undertaker, but not be shown on their records.

Rev	Description	By	Chk	App	Date
P01	Issued to clear LLFA comments.	BS	MF	GP	18.12.24

Purpose of Issue : **For Planning**

Status Code : **S3**

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Project : **Queensmere House**
East Grinstead

Drawing : **Flood Exceedance Plan**

Acies Job No : **3470118**

Scale @ A1 : **1:100**

Drawing No : **0118-ACS-XX-XX-DP-9201**

Rev : **P01**