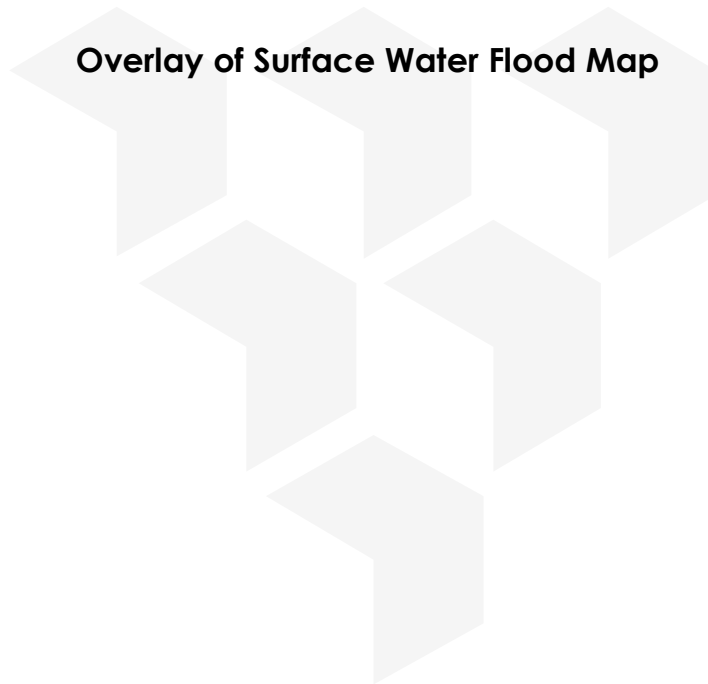
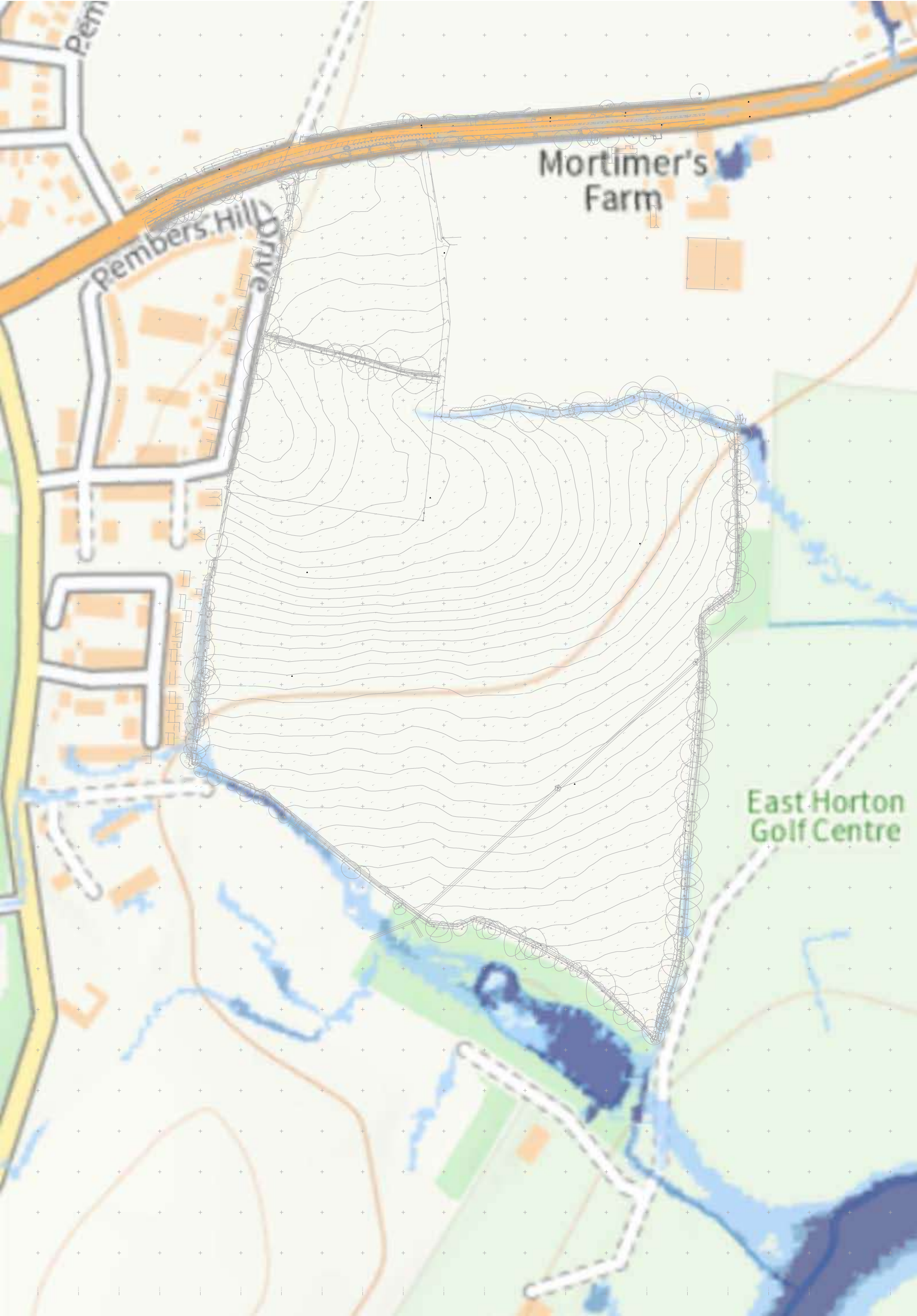


Appendix B

Overlay of Surface Water Flood Map





Appendix C

Greenfield Run-Off Parameters and Results

UK and Ireland Rural Runoff Calculator

ICP SUDS / IH 124
ADAS 345
FEH
ReFH2
Greenfield Volume

Method
☒ ICP SUDS
☐ IH 124

Area (ha)

SAAR (mm)

Soil
Map

Region

Additional Options

Urban

Return Period (years)

Growth Curve

Calculate

Results

Region	GBWR Rural (L/s)	GBWR Urban (L/s)	Q 1 (years) (L/s)	Q 30 (years) (L/s)	Q 100 (years) (L/s)
Region 7	62.5	62.5	62.1	141.7	159.4

OK
Cancel

Calculation Method
 Help

Appendix D

Southern Water Pre-Development Enquiry



Rob Gill
Charles House
148 Great Charles Street
Queensway
Birmingham
West Midlands
B3 3HT

Your ref

Our ref

12292

Date

13 October 2023

Contact

Tel 0330 303 0119

Dear Mr Gill,

Level 1 Capacity Check Enquiry: Fair Oak, Hampshire, SO50 7BT.

We have completed the capacity check for the above development site and the results are as follows:

Foul Water

There is currently inadequate capacity within the foul sewerage network to accommodate a foul flow of **2.03 l/s** for the above development at manhole reference **SU49188603**. The proposed development would increase flows to the public sewerage system which may increase the risk of flooding to existing properties and land. Additional off-site sewers or improvements to existing sewers will be required to provide sufficient capacity to service the development. Southern Water has a duty to provide Network capacity from the point of practical connection (point of equivalent or larger diameter pipe) funded by the New Infrastructure Charge.

Southern Water aim to provide this within 24 months following the date that planning has been granted for developments not identified as strategic sites in our current business plan. Strategic sites are larger developments and will often take longer than 24 months for a full solution to be provided.

The nearest point where capacity is currently available is at **SU50184301** which is located approximately **250 metres** Southwest of the proposed development site. Rights are not issued for a direct connection to Wastewater Treatment Works (WTW). Please note that connection to the WTW will have to be agreed by Southern Water Services before being carried out.

Please note, the assessment that has been undertaken has used an assumed pump rate of 6 l/s. This has been calculated using Southern Water's modelling specifications.

New Infrastructure Charging

Please note as of 1st April 2018 we have moved to the "New Connections Services Charging Arrangements". We understand that this may cause uncertainty for customers, particularly where they may have already committed to a development based on previous charging arrangements. We



have worked with our stakeholders and Water UK to agree a set of principles by which we will base our charges. Please read through our new charging arrangement documents available at the following link: southernwater.co.uk/developing-building/connection-charging-arrangements

Alternatively, New Appointees and Variations (NAVs), also known as 'inset' companies, can provide new connection services or take ownership of the new water and wastewater connection infrastructure provided for a new development. NAVs are appointed by Ofwat and replace the regional water company. It is for the developer to choose whether to use a NAV or the regional water company to supply services for new sites, according to certain legal criteria.

Connecting to our network

It should be noted that this information is only a hydraulic assessment of the existing sewerage network and does not grant approval for a connection to the public sewerage system. A formal Sewer Connection (S106) application is required to be completed and approved by Southern Water Services. To make an application visit: developerservices.southernwater.co.uk

Please note the information provided above does not grant approval for any designs/drawings submitted for the capacity analysis. The results quoted above are only valid for 12 months from the date of issue of this letter.

Please get in touch via the Get Connected customer dashboard if you have any queries.

Yours sincerely,

Future Growth Planning Team
Developer Services

southernwater.co.uk/developing-building/planning-your-development

LLFA meeting with Thomas Callaway – summary notes

Land south of Mortimer's Lane, Fair Oak

1.0 Surface Water Drainage

- It was agreed that infiltration drainage is unlikely to be meaningful on this site. In this case given the ground conditions and desk study information, the LLFA will not require infiltration testing to be provided to support the outline planning application in order to be able to eliminate it as a feasible strategy.
- The LLFA agree that a restricted discharge to the local ditches and watercourses surrounding the site is the most sensible strategy to pursue for this site.
- The outfall rate suggested in the pre-application technical note, 5.65 l/s/ha of developable area, is of the order of magnitude that the LLFA would expect.
- The LLFA advised that they expect rainfall predictions to be given an additional allowance of +45% on the 1% AEP storm to account for the effects of climate change, in line with the latest guidance for the East Hampshire Management Catchment (as opposed to the +40% value used in other parts of the country and in older guidance for Hampshire).
- Given the natural slope of the site, the LLFA advised that they understand it is sometimes difficult to achieve workable open SuDS features on steep slopes and while open features are preferred they will not reject a strategy that includes some below ground & crated storage in order to allow appropriate attenuation to be provided.
- It was noted that the provision of play space/LEAP above the crates is acceptable as long as there is sufficient provision for maintenance.
- At outline planning, the LLFA's major concern is to ensure that suitable outfall rates are proposed and suitable attenuation has been considered and factored into the layout. They do not need to see full details for attenuation features etc at outline stage, and they are not concerned if the landscape design and so on change subsequently provided suitable sizing is maintained.
- Bloor advised that our preliminary landscape design proposes feature interfaces to some attenuation features that may involve steep banks and/or retaining in some areas. The LLFA advised that their preference is for shallow slopes that are easy to access for both safety and maintenance reasons. However they were prepared to consider a detail with steeper slopes provided it is clear how safety and maintenance requirements can be achieved. The LLFA would not normally examine features in this kind of detail at outline planning (and would instead consider this detail at the reserved matters stage); however Bloor advised that we may provide fuller details where non-standard features are proposed and request that they be specifically approved (or discussed and modified as appropriate) at this early stage so that we can give confidence to other statutory consultees consulted as part of the planning application (eg landscape and ecology officers) that our landscape proposals can be relied on and will not be rejected by the LLFA at a later stage.
- The LLFA advised that a short section of ditch culverting to enable an access can generally be accepted, but the culverted section must be as short as possible. Wider culverting of ditches is not acceptable. An Ordinary Watercourse Consent would be required for the culvert, as well as an additional consent for every headwall/outlet to be constructed to a ditch or watercourse. The OWC process is separate from the planning process but the LLFA will generally include a comment in their planning response to remind developers that the OWC is also required.

2.0 Foul Water Drainage

- The LLFA advised that they do not comment on foul drainage proposals.

3.0 General/Other

- Hampshire LLFA are in the process of creating new guidance relating to boundaries adjacent to ditches and watercourses. Depending on planning timescales it is unlikely this will be published in time to officially affect this application, but the LLFA asks the developer to bear in mind that they will prefer treatments that allow for ditches and watercourses to be included into management

company/shared/public areas rather than be backed onto private gardens to avoid individual properties being nominally responsible for the maintenance of each section of ditch. A sufficient buffer/set back/easement between ditches and gardens should be included to allow for maintenance access.

- As part of this pre-application engagement, the LLFA will be able to review and provide comments on a draft FRA prior to the submission of an outline planning application if desired.





Hampshire
County Council

Universal Services
The Castle
Winchester, Hampshire SO23 8UD

Tel: 0300 555 1375
Fax 01962 847055
www.hants.gov.uk

Enquiries to	Thomas Callaway	My reference	SWM-PRE/2023/0698
Direct Line	03707 798982	Your reference	
Date	15 January 2024	Email	swm.consultee@hants.gov.uk

Dear Sir/Madam,

**Proposed development/FRA at MORTIMERS FARM MORTIMERS LANE,
FAIR OAK, EASTLEIGH, HAMPSHIRE SO50 7EA(Application No.**

Hampshire County Council as Lead Local Flood Authority has provided comments in relation to the above pre-application in our role as statutory consultee on surface water drainage for major developments. The Glanville note of 11/1/24 produced after the pre-application advice meeting is deemed to be an accurate record of the discussions had.

In order to assist applicants in providing the correct information to their Local Planning Authority for planning permission, Hampshire County Council has set out the information it requires to provide a substantive response at <https://www.hants.gov.uk/landplanningandenvironment/environment/flooding/planning>

Assessment of Flooding

The site is within Flood Zone 1 and is at very low risk of flooding from surface water.

Surface Water Management

Infiltration is the preferred drainage strategy of the LLFA, but is dependent on successful infiltration testing and sufficiently low winter groundwater levels. The potential for infiltration may be restricted by the geology type at the site. The ground conditions at this site are unlikely to support an infiltration drainage strategy.

Director of Universal Services
Patrick Blogg

An alternative drainage strategy reliant on attenuation with a restricted discharge to a watercourse adjacent to the site has been proposed, which is acceptable. Attenuation storage should be an appropriate size to allow for the 1 in 100 year storm event (plus peak rainfall allowance) to be attenuated while discharging at rates no greater than greenfield runoff rates. The discharge would be restricted to Q_{bar} , and it must be ensured that the discharge rate does not exceed the equivalent greenfield runoff rate for all storms up to the 1 in 100 year event. Flow control devices should have an orifice of sufficient diameter that it is not prone to blockages. Vortex flow control devices generally allow for a greater orifice diameter for equivalent flow rates when compared with a simple orifice plate.

For a full or reserved matters application, or an application to discharge a condition relating to surface water drainage details, hydraulic calculations for the whole surface water drainage network must be provided to show that flooding does not occur for the 1 in 30 year storm event, inclusive of a peak rainfall allowance appropriate for the location and design life of the development. Any flooding modelled for the 1 in 100 year storm event (including peak rainfall allowance) should have its extent marked up on a layout. Further information on peak rainfall allowances and how to apply them can be found here: <https://environment.data.gov.uk/hydrology/climate-change-allowances/rainfall> and here: <https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances#using-peak-rainfall-intensity-allowances-to-assess-surface-water-flood-risk>. Urban creep must be considered by increasing the residential impermeable areas (excluding flats) by 10% to account for driveways and extensions that may be constructed in the future. Flood exceedance flow routes should also be shown on a layout, showing that overland flow routes avoid properties in the event of a failure of the drainage system.

Maintenance details will be required for the surface water drainage system components. This would need to include essential maintenance activities, the frequency of maintenance, and the responsible party for maintenance. Note that the maintenance of any ditches deemed to be the responsibility of the landowner is covered by the relevant section of the Land Drainage Act 1991, and the LLFA has enforcement powers to ensure the free flow of water. Easements for ditches are strongly recommended, and could be incorporated in open space corridors.

SuDS Design and Selection of Drainage Features

SuDS should be provided to include an element of biodiversity and amenity as well as managing water quality and quantity. Quantity should be assessed through hydraulic calculations for the relevant modelled storm events. Network calculations should be provided for a full application to determine whether flooding occurs at manholes in piped parts of the system. Water treatment must be assessed through the simple index approach, with consideration given to each treatment train. It may be necessary to incorporate additional

SuDS features to ensure that runoff quality is improved through the drainage system.

It is understood that open SuDS features may not be viable across the whole of this steeply sloping site, and that open space above attenuation tanks may be required for other uses. This is acceptable subject to consideration being given to the loading and suitable maintenance access being provided. The basin is proposed to have one side that has a steeper slope than best practice guidance recommends, to provide amenity benefits. For a shallow basin that is otherwise accessible for maintenance this is acceptable. The provision of additional railings and signage may be required along this edge for safety reasons.

Ordinary Watercourse Consenting

Any alterations to ordinary watercourses (if present), open or culverted, may require ordinary watercourse consent from the LLFA. Maintenance works do not require consent, but any temporary works required to enable maintenance may require consent. For pre-application advice and general consenting information, please see: <https://www.hants.gov.uk/landplanningandenvironment/environment/flooding/cangewatercourse>.

Surface Water Checklist

In addition to this pre-application advice, please refer to the Surface Water Checklist for the information required by the LLFA for different types of planning application: <https://www.hants.gov.uk/landplanningandenvironment/environment/flooding/planning>. This checklist is accompanied by guidance notes and details exactly what is required for the LLFA to review the surface water drainage proposals, depending on the type of planning application.

Yours faithfully,



Thomas Callaway
Senior FWM Project Officer



Hampshire
County Council

Mrs L Moxon
Glanville Consultants
62 Foxhall Road,
Didcot
Oxon
OX11 7AD

Universal Services
The Castle
Winchester, Hampshire SO23 8UD
Telephone 0300 555 1375
Fax 01962 847055
www.hants.gov.uk

Enquiries to Flood & Water Management

My reference HFI-2023-0057

Direct line 01962 846730

Your reference

Date 18/12/2023

E-mail fwm@hants.gov.uk

Dear Mrs Moxon,

Re: Mortimers Farm, Fair Oak

We refer to your request for historic flood information on 11/12/2023.

Thank you for your application for historic flood information for this site. Please find below the information we have on our systems that we believe to be relevant for this request. Kindly note the declaration on the final page with regards to this information.

Historic flooding information

We have reviewed our records of flood incidents for this area and have no records of flooding within a 250m radius of the site. This does not necessarily mean that other flood events have not occurred, they either may not have been reported or events may have occurred prior to 2012 – Hampshire County Council as Lead Local Flood Authority have only been maintaining flood records since then following the establishment of the Flood and Water Management Act 2010. The Environment Agency (EA) may hold data on flood events prior to this date.

Please refer to attached map for the location of this flood event(s). Kindly note that outlines of areas highlighted as highway flooding on the map may include properties or other off-highway areas that were not impacted by flooding.

There is no flood report undertaken for this specific area under Section 19 of the Flood and Water Management Act where significant flooding was reported.

Flood risk from surface water

The EA's Updated Flood Map for Surface Water illustrates the potential area of surface water flooding taking into account the topography and permeability of the area. It also includes factors to take into account drainage provision. This information is designed to be high level and should not be used to indicate specific properties and risk but identify low points and potential flow routing. The mapping indicates that this address is not within an area at low risk of surface water flooding. Low risk means that each year this area has a chance of flooding of between 0.1% and 1%, and some parts of the site may flood to a depth of 0.15m.

For more information on this flood risk, please see <https://flood-warning-information.service.gov.uk/long-term-flood-risk/map>

HCC has prepared Surface Water Management Plans which are available on our website. For more detailed information on flooding in the Eastleigh Borough Council administrative area, please see their Strategic Flood Risk Assessment, which can be found at [Microsoft Word - PUSH SFRA EBC Guidance Final Draft](#)

Flood risk from watercourses

Watercourses are any natural or artificial channel above or below ground through which water flows. Watercourses are classified as either 'Ordinary Watercourse' or 'Main River'. Ordinary watercourses are watercourses that are not part of a Main River and include streams, ditches, drains, culverts etc. through which water flows. The Lead Local Flood Authority (LLFA - in this instance Hampshire County Council) are responsible for managing the risk from ordinary watercourses and have powers to ensure maintenance is undertaken by the relevant body, usually the adjacent landowner. For more information, see <http://documents.hants.gov.uk/flood-water-management/HCCFloodRiskManagement-Landowners.pdf>.

Main Rivers are typically larger streams and rivers, but some are smaller watercourses of local significance. Main Rivers are nationally managed by the Environment Agency, but responsibility for maintenance remains with the landowner.

There is one Main Rivers within 250m of this site. Known Ordinary watercourses are marked on the attached map(s); however it should be noted that many ordinary watercourses are not recorded centrally (such as small ditches etc.). The site is located within the water body catchment of the Hamble River .

For more information regarding fluvial (river) and tidal flooding and flood risk please contact the Environment Agency or refer to the following website: <https://flood-map-for-planning.service.gov.uk/>

Ordinary Watercourse Consenting

Hampshire County Council is responsible for issuing Ordinary Watercourse Consents. These consents assess the flood risk of proposed changes (both permanent and temporary) to ordinary watercourses and are a legal requirement of such work. We have four records of Ordinary Watercourse Consents (OWCs) within the search area.

Please refer to the Hampshire County Council OWC website for further information and the forms for consents:

<https://www.hants.gov.uk/landplanningandenvironment/environment/flooding/change-watercourse>

The consenting process has a statutory timeframe of two months from when the application is validated. To request data relating to consents prior to 2012 please contact the EA on: psohiow@environment-agency.gov.uk

Any works proposed within eight metres of a main river are likely to require a flood risk permit from the Environment Agency. Please refer to the following for further information: <https://www.gov.uk/guidance/flood-risk-activities-environmental-permits>

Flood risk from sewers

For information regarding foul flooding, please contact Southern Water.

Vulnerability of site from groundwater

Groundwater is by definition hard to predict and difficult to manage. The geology of the site in question is primarily London Clay with sand and silt.

Hampshire County Council hold no records of groundwater flooding in the area, however this does not necessarily mean that other flood events have not occurred. It can be difficult to define flooding as a result of groundwater particularly in those areas where silt, gravel and sand can lead to a perched watertable which can prevent infiltration drainage from working as opposed to being a groundwater emergence flood event which tends to be seen linked to chalk aquifers.

Please note this information should only be used to establish relative, but not absolute, risk of groundwater flooding. A more detailed assessment including groundwater monitoring may be required.

More detailed information is available in relation to potential groundwater flood risk from the British Geological Society however it should be noted that this is a chargeable service. For further information please refer to:

<https://www.bgs.ac.uk/research/groundwater/datainfo/GFSD.html>

Hampshire County Council has a draft Groundwater Management Plan that is available on our website which contains useful information. It can be found at:

<https://www.hants.gov.uk/landplanningandenvironment/environment/flooding/strategies/groundwater-management-plan>

Environmentally designated sites

We note that the site is within 250m of two designated environmental sites:

- Knowle Lane Open Space SINC;
- Land at Knowle Lane, Fair Oak SINC

Drainage Assets

We do not hold information in relation to private or third party drainage assets but are aware that Hampshire County Council as Highways Authority are responsible for many assets within and draining the Highway.

It is the responsibility of Hampshire Highways to maintain their assets on the highway, and they are on a regular cleansing schedule. If there are any issues with any highway gullies, soakaways, culverts etc. from a maintenance perspective, this can be flagged on the online system:

<https://www.hants.gov.uk/transport/roadmaintenance/roadproblems>

If flooding issues are reported to Highways and are in relation to Highway infrastructure, we as LLFA may not have access to these records and you may need to place a request for this information using the above link.

If you have any further queries, please contact the Flood and Water Management (FWM) Team quoting the above reference

Kind regards

FWM Team
fwm@hants.gov.uk

Please Note: The data supplied has been compiled from a variety of sources of varying reliability. The data is constantly being revised and validated to ensure the highest accuracy possible. However, the data should not be relied upon or considered completely accurate and the data is provided on the understanding that neither the County Council nor the disclosing officer is to be held responsible should you rely on this data and consequently suffer damage.

This response has been provided using the best knowledge and information submitted as part of the planning application at the time of responding and is reliant on the accuracy of that information.

Hampshire County Council defines significant flooding as 'flooding that affects 20 or more properties internally in one flood event within the same location OR flooding that affects significant lengths of highways affecting 20 or more properties and lasts for a period of 3 hours from the onset of flooding'. For more information on how we define flooding, please see our guidance on our website <http://documents.hants.gov.uk/flood-water-management/FloodInvestigationsguidance.pdf>

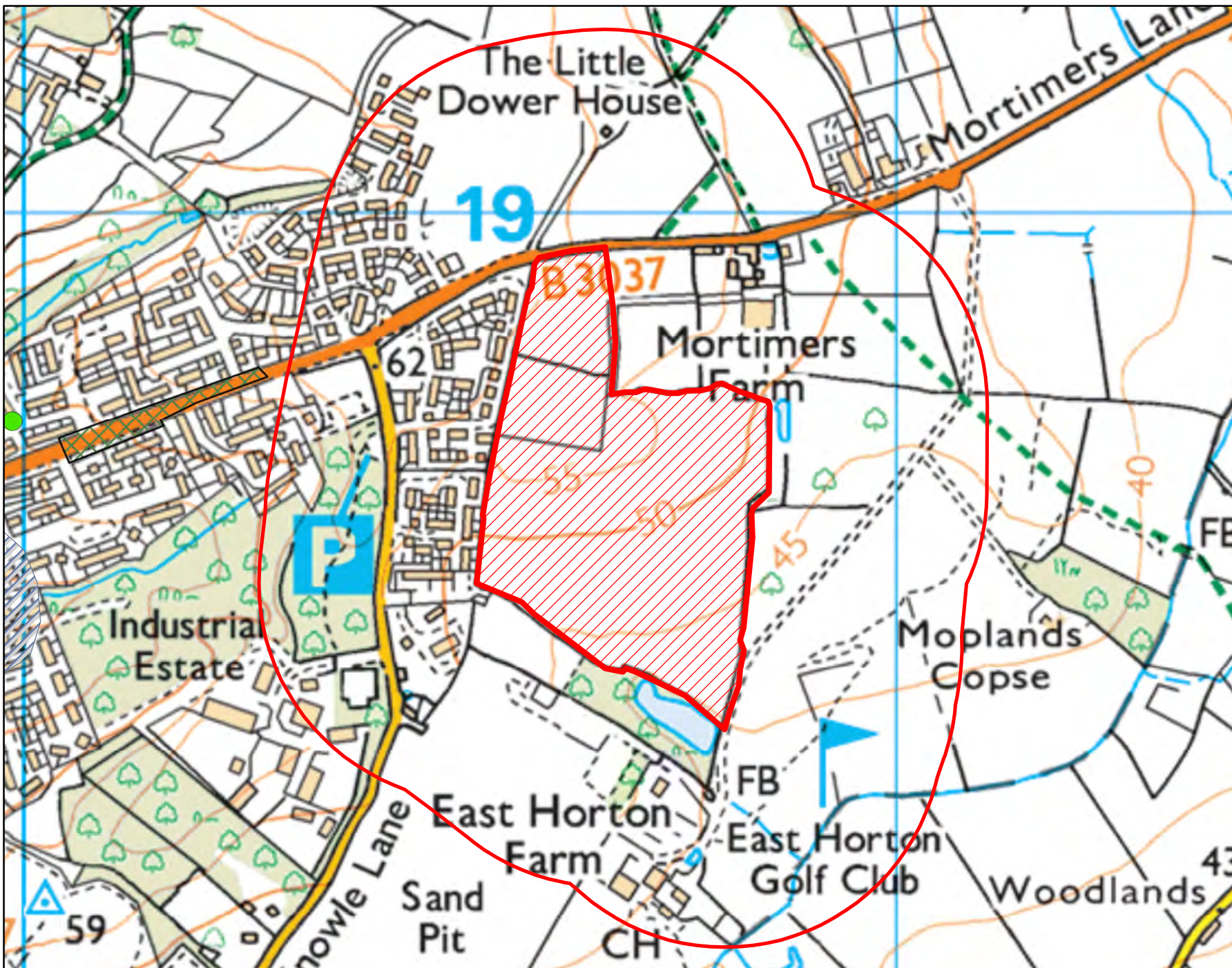
You may find the following websites useful –

- <http://bluepages.org.uk/>
- <https://nationalfloodforum.org.uk>
- <https://nationalfloodforum.org.uk/about-flooding/reducing-your-risk/protecting-your-property/>
- http://hummedia.manchester.ac.uk/institutes/mui/cure/research/documents/Property_owners_booklet_web_000.pdf (linked from the National Flood Forum)
- <https://www.floodre.co.uk/>

Users' Disclaimer

I understand that in using advice provided by the Hampshire Flood and Water Management Team I am aware of the following:

1. The Flood and Water Management (FWM) Team is part of Hampshire County Council ("We/Us/Our"). The Council holds copyright of this information and advice on behalf of the FWM team except where service level agreements state otherwise. No direct reproduction of this advice will be allowed as a direct copy, except for the purpose of Environment Information Requests.
2. Advice provided by the Hampshire FWM Team will only be used for the purpose stated and will not be stored beyond the life of the project for which it was acquired.
3. Any personal information supplied in association with these records will not be used, copied, or passed to any third party without the consent of the Hampshire FWM Team and in accordance with the GDPR.
4. Whilst every reasonable effort is made to validate information supplied to and by the Hampshire FWM Team owing to the dynamic and judgmental nature of information relating to flooding, the Hampshire disclaims any responsibility for the accuracy or comprehensiveness of the information supplied, and accepts no liability for any indirect, consequential, or incidental damages or losses arising from use of the information.
5. I am aware of the Hampshire FWM Team charging schedule and understand I may be charged for the advice.
6. All web links are accurate as on the day they were accessed.



Legend

- 250m buffer
 - Site
 - Flood & Water Management Section 19
 - No Value
- Hampshire Flood Enquiries**
enq_status_name
- Resolved Flood Enquiry

Historic Flood Information Request

Historical Flooding Information

L Moxon c/o Glanville

Mortimers Farm, Fair Oak

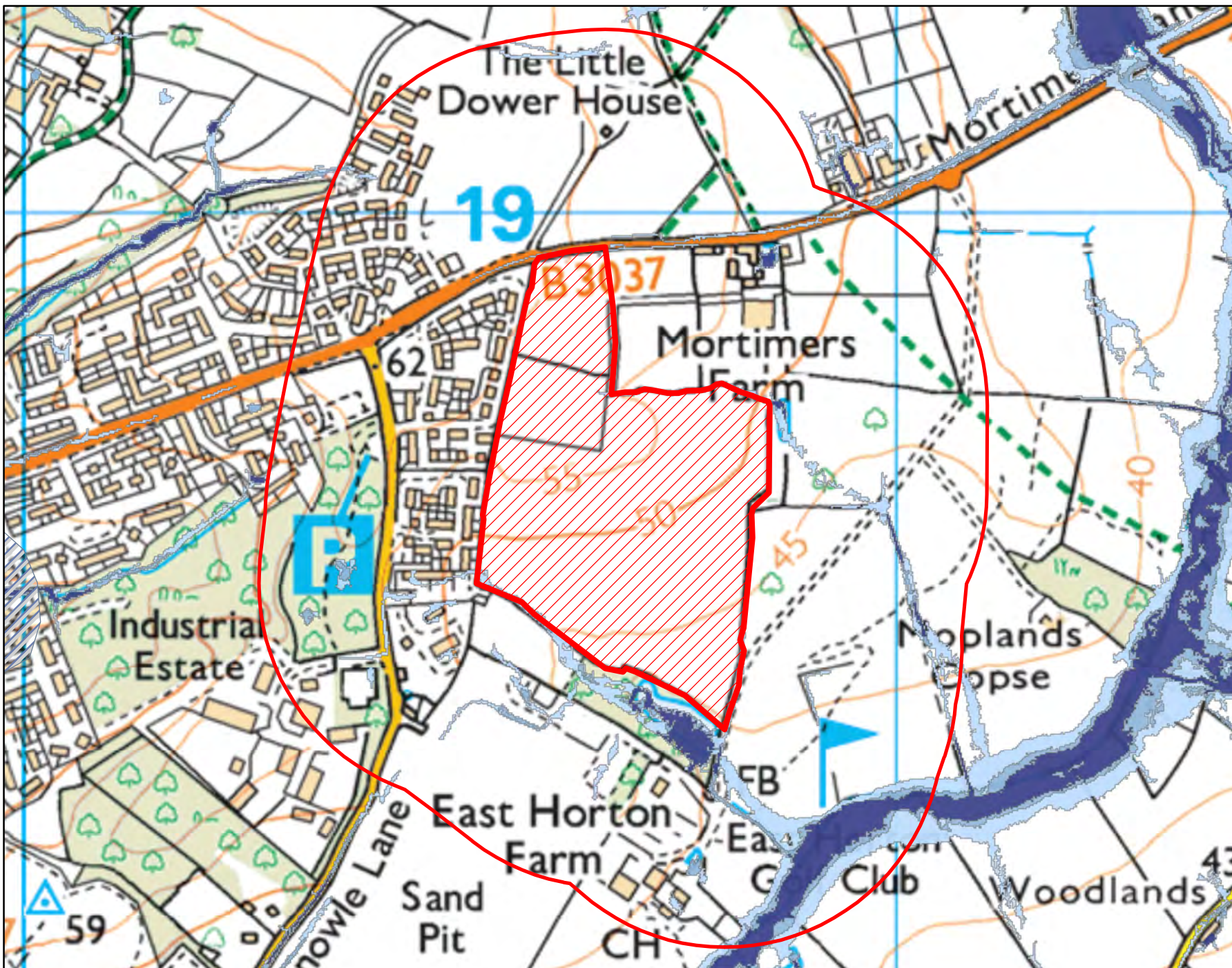
Notes:

0 0.1 0.2
Kilometers

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1:6,000

Date:	18/12/2023	Sheet:	1 of 1
Revision:	1	Initials:	CT



Legend

- 250m buffer
- Site
- Flood & Water Management Section 19
- Flood Maps for Surface Water (High)
- Flood Maps for Surface Water (Medium)
- Flood Maps for Surface Water (Low)

Historic Flood Information Request

Flood Map for Surface Water

L Moxon c/o Glanville

Mortimers Farm, Fair Oak

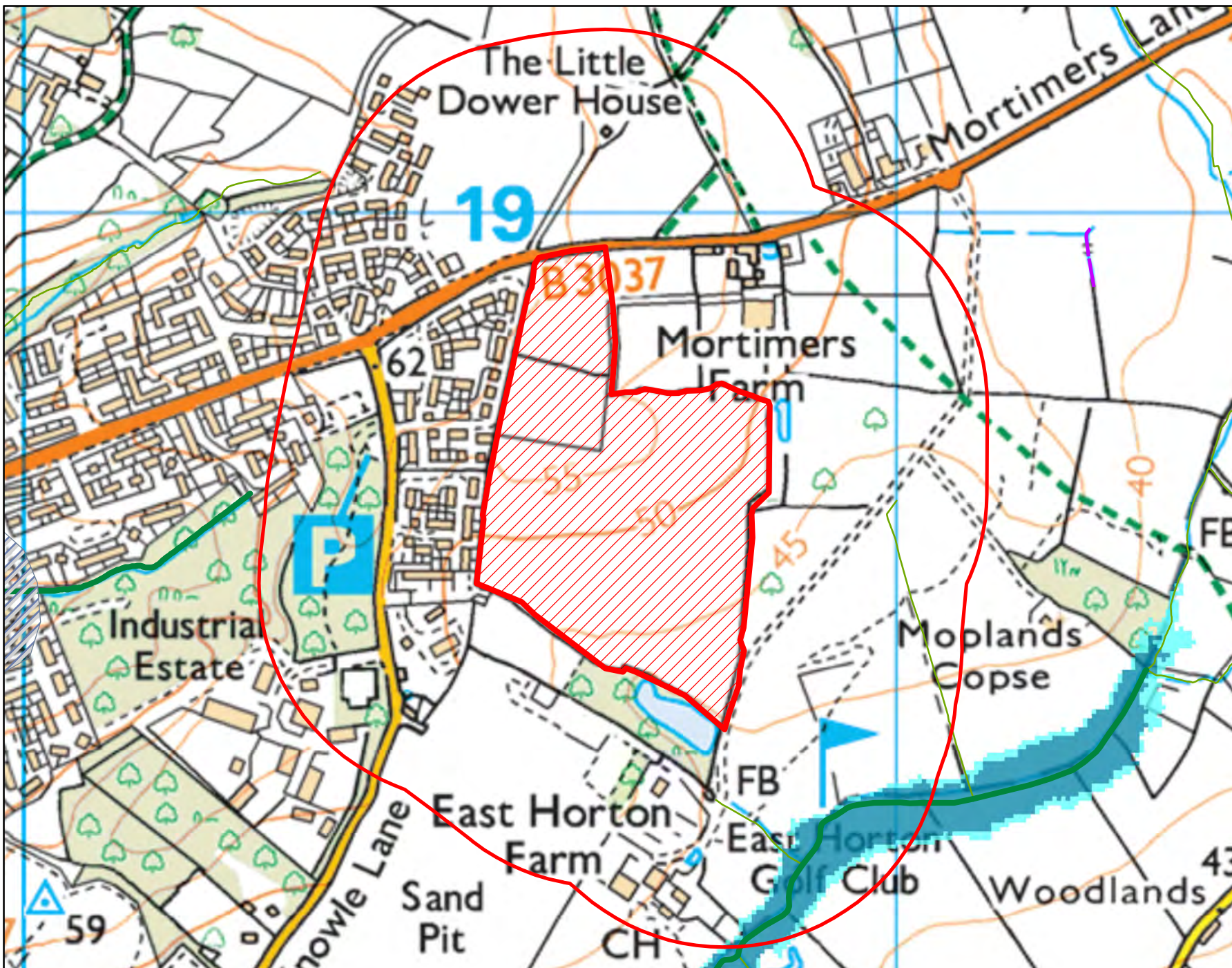
Notes:

0 0.1 0.2
Kilometers

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1:6,000

Date:	18/12/2023	Sheet:	1 of 1
Revision:	1	Initials:	CT



Legend

- 250m buffer
- Site
- Flood & Water Management Section 19
- Main River (as defined by EA)
- non main river
- mainriv
- FRM Indicative Main River
- Detailed River Network - Off-line Drainage
- Flood Zone 3
- Flood Zone 2

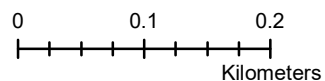
Historic Flood Information Request

E A Flood Zones and Detailed River Network

L Moxon c/o Glanville

Mortimers Farm, Fair Oak

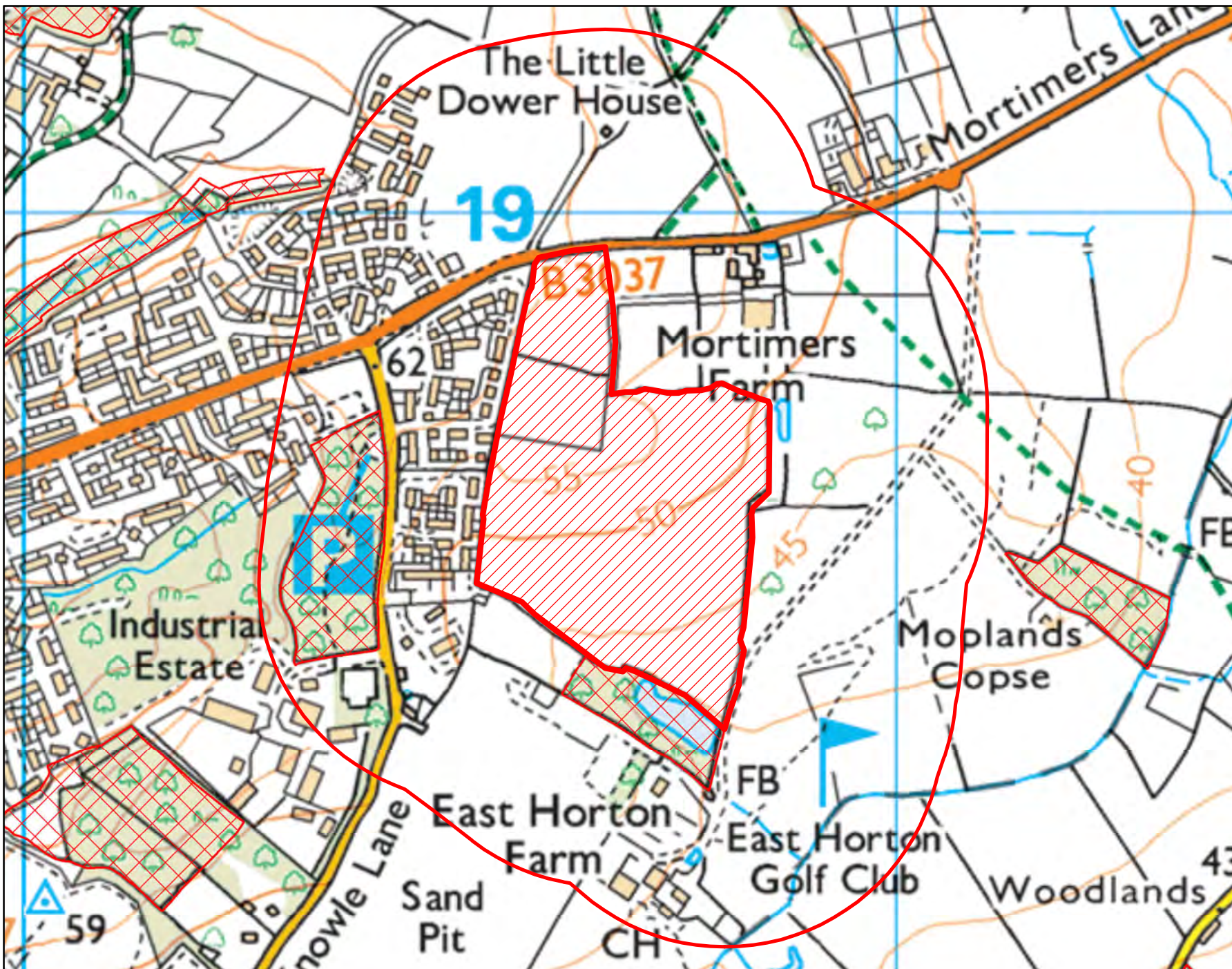
Notes:



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1:6,000

Date:	18/12/2023	Sheet:	1 of 1
Revision:	1	Initials:	CT



Legend

- 250m buffer
- Site
- SINC

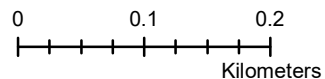
Historic Flood Information Request

Environmental Designations

L Moxon c/o Glanville

Mortimers Farm, Fair Oak

Notes:



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Date:	18/12/2023	Sheet:	1 of 1
Revision:	1	Initials:	CT



Hampshire
County Council

Appendix F

Environment Agency Flood Map for Planning Extract

Flood map for planning

Your reference
8230679_FMfP

Location (easting/northing)
450689/118682

Created
10 Jul 2024 16:36

Your selected location is in flood zone 1, an area with a low probability of flooding.

You will need to do a flood risk assessment if your site is **any of the following:**

- bigger than 1 hectare (ha)
- In an area with critical drainage problems as notified by the Environment Agency
- identified as being at increased flood risk in future by the local authority's strategic flood risk assessment
- at risk from other sources of flooding (such as surface water or reservoirs) and its development would increase the vulnerability of its use (such as constructing an office on an undeveloped site or converting a shop to a dwelling)

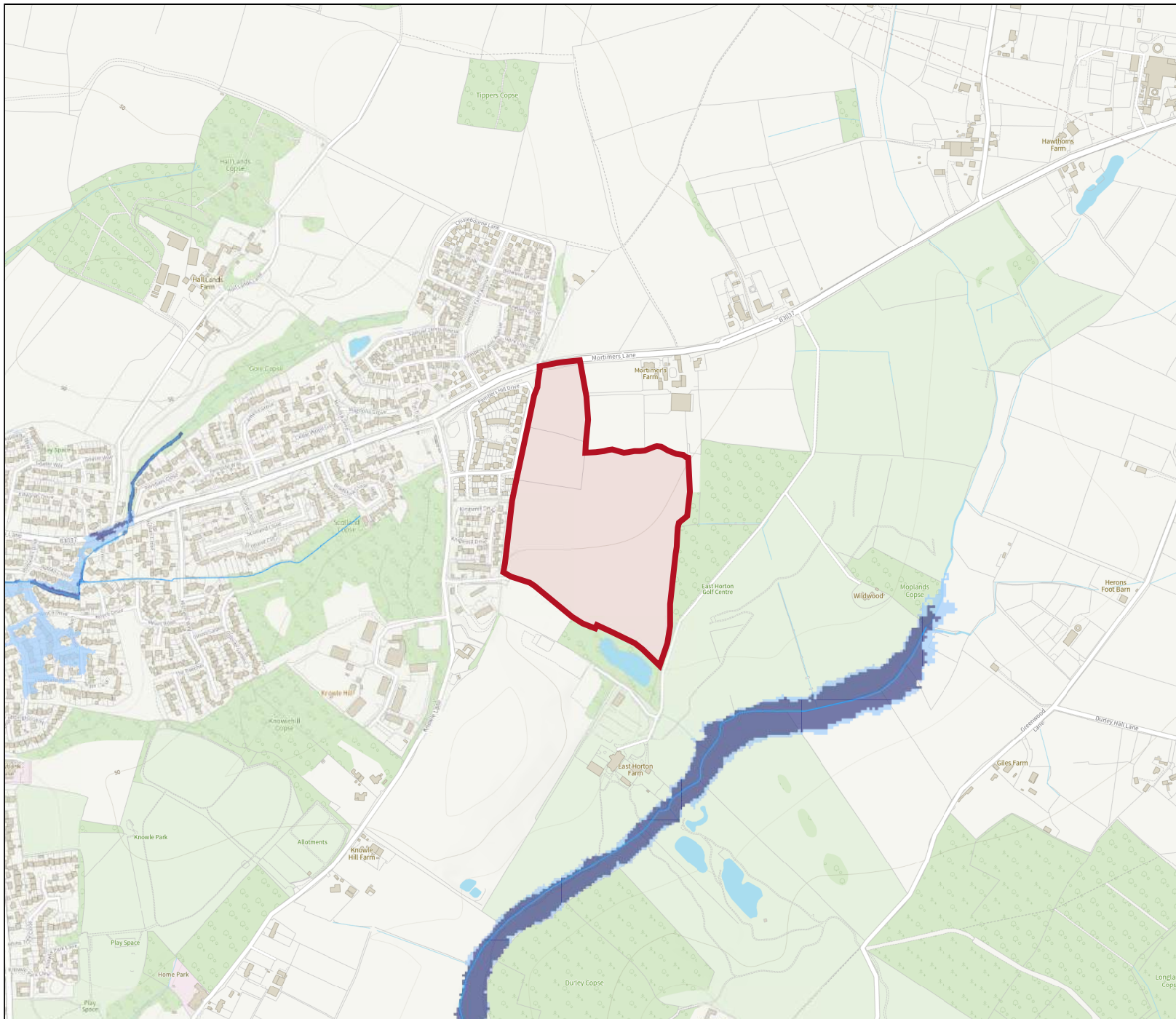
Notes

The flood map for planning shows river and sea flooding data only. It doesn't include other sources of flooding. It is for use in development planning and flood risk assessments.

This information relates to the selected location and is not specific to any property within it. The map is updated regularly and is correct at the time of printing.

Flood risk data is covered by the Open Government Licence **which** sets out the terms and conditions for using government data. <https://www.nationalarchives.gov.uk/doc/open-government-licence/version/3/>

Use of the address and mapping data is subject to Ordnance Survey public viewing terms under Crown copyright and database rights 2022 OS 100024198. <https://flood-map-for-planning.service.gov.uk/os-terms>



Flood map for planning

Your reference
8230679_FMfP

Location (easting/northing)
450689/118682

Scale
1:10000

Created
10 Jul 2024 16:36

-  Selected area
-  Flood zone 3
-  Flood zone 2
-  Flood zone 1
-  Flood defence
-  Main river
-  Water storage area


0 100 200 300m

Appendix G

Environment Agency Flood Risk from Surface Water Map Extract



Surface water

Extent

High

More than 3.3% chance each year

Medium

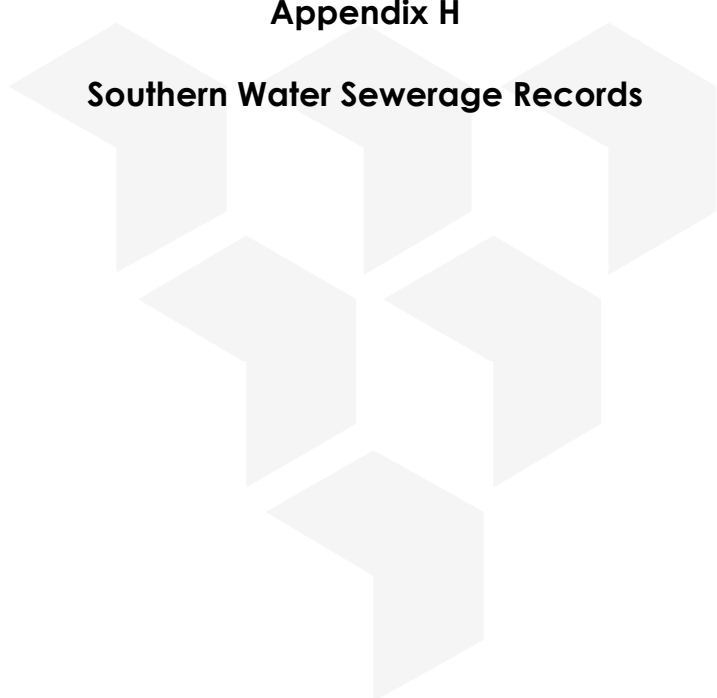
Between 1% and 3.3% chance each year

Low

Between 0.1% and 1% chance each year



Overlay of EA's Flood Map for Surface Water on Mortimers Lane site Topographical Survey
GC. LM. Nov 2023



Appendix H

Southern Water Sewerage Records



Appendix I

Greenfield Run-Off Calculations

UK and Ireland Rural Runoff Calculator

ICP SUDS / IH 124

ADAS 345

FEH

ReFH2

Greenfield Volume

Method

☒ ICP SUDS

☐ IH 124

Area (ha)

11.06

SAAR (mm)

801.0

Map

Soil

0.470

Region

Region 7

...

Additional Options

Urban

0.000

Return Period (years)

0

Growth Curve

(None)

Calculate

Results

Region	QBAR Rural (L/s)	QBAR Urban (L/s)	Q 1 (years) (L/s)	Q 30 (years) (L/s)	Q 100 (years) (L/s)
Region 7	62.5	62.5	53.1	141.7	199.4

OK

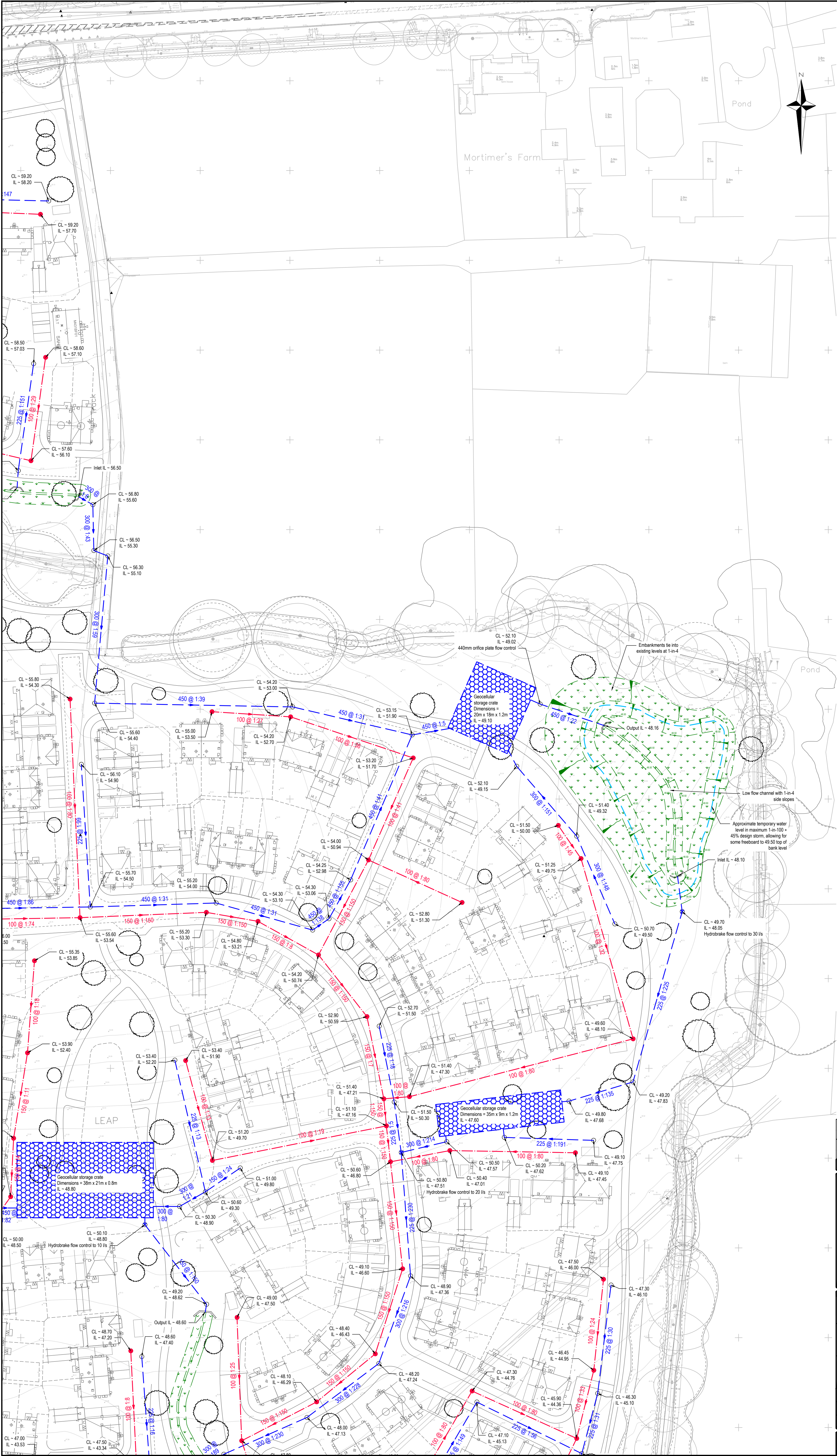
Cancel

Calculation Method

Help

Appendix J

Indicative Drainage Strategy Drawings



NOTES

- 1. This drawing to be read in conjunction with all relevant documents and specifications.
- 2. Dimensions to be scaled for planning purposes only.
- 3. Proposed site layout taken from Pegasus Group drawing P23-2261_DE_100_C Testing Layout.
- 4. Topographical survey taken from Siteline drawing 01MK001 Site Survey.
- 5. All drainage to be installed in accordance with building regulations part H and BS8582.
- 6. Proposed levels shown on this drawing are based on the existing ground levels of the site and are indicative only. Levels will need to be reviewed at detailed design once site layout is fixed.

KEY:

- 300 @ 1:46 Proposed surface water sewer and manhole
- 150 @ 1:46 Proposed foul water sewer and manhole
- Proposed foul water rising main
- Proposed geocellular attenuation tank, dimensions and levels as described
- Proposed conveyance and filtration swale with 1-in-4 side slopes
- Proposed dry attenuation basin, details and levels as shown
- Proposed wet pond with attenuation volume above permanent water level

P2	Updated following client comments and issued for planning.	23/10/24	LM	KR
P1	For review and comment.	04/09/24	LM	KR

Rev	Description	Date	By	Chkd
-----	-------------	------	----	------

**Glanville**
Survey > Plan > Engineer

Civil Engineering

Structural Engineering

Transport Planning

Highways Engineering

Building Surveying

Geomatics

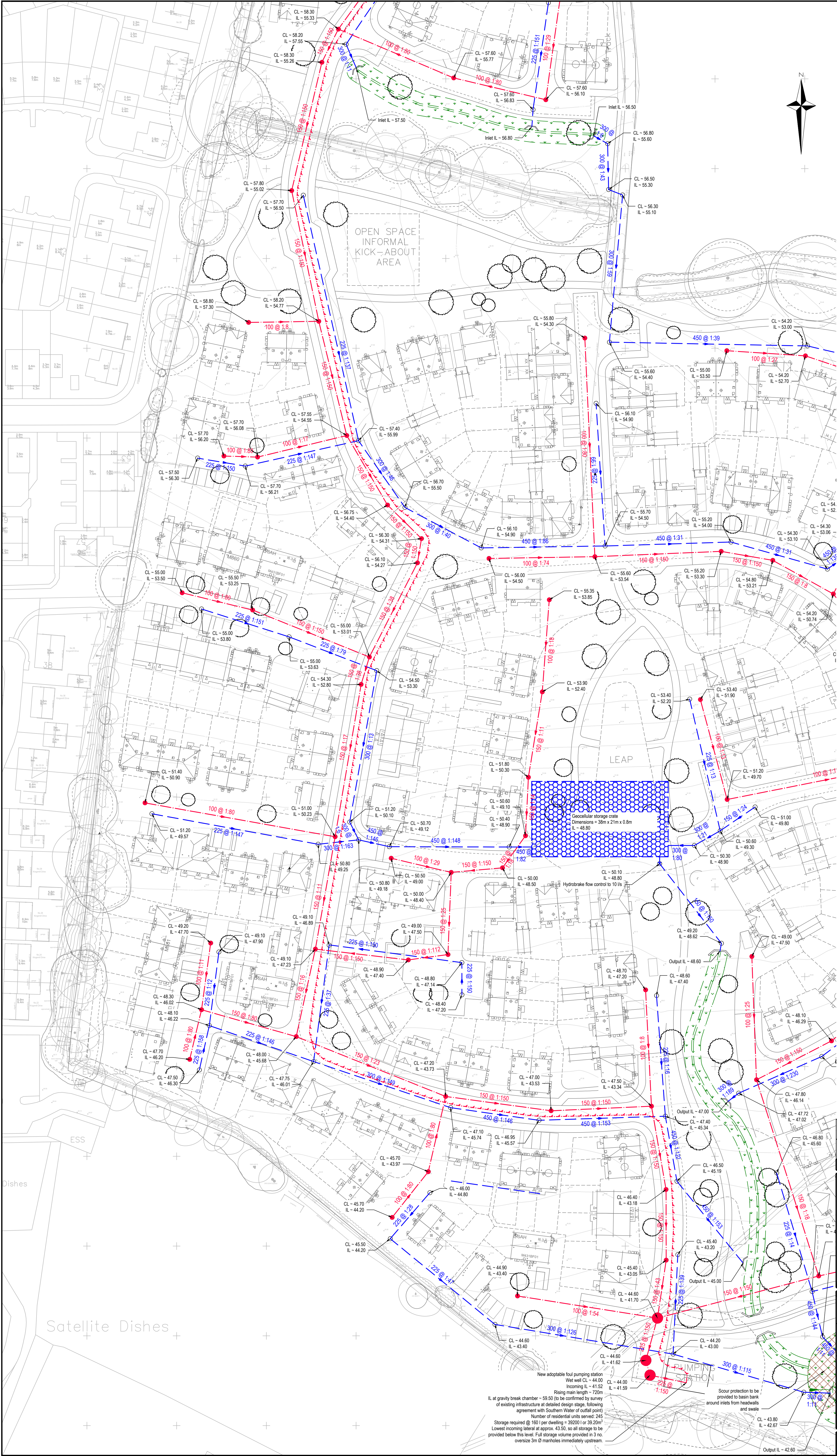
Hertfordshire

Oxfordshire

Cambridgeshire

Bristol

Client:	Bloor Homes		
Project:	Land at Mortimers Lane Fair Oak		
Title:	Indicative Drainage Strategy Sheet 2		
Engineer:	LM	Date:	Aug 2024
Director:	AJ	Scale:	1:500
Status:	PLANNING		
Drawing No.	8230679/1002		Rev P2



- NOTES**
1. This drawing to be read in conjunction with all relevant documents and specifications.
 2. Dimensions to be scaled for planning purposes only.
 3. Proposed site layout taken from Pegasus Group drawing P23-2261_DE_100_C Testing Layout.
 4. Topographical survey taken from Siteline drawing 01MK001 Site Survey.
 5. All drainage to be installed in accordance with building regulations part H and BS8582.
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- KEY:**
- 300 @ 1:46 Proposed surface water sewer and manhole
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P2	Updated following client comments and issued for planning.	23/20/24	LM	KR
P1	For review and comment.	04/09/24	LM	KR
Rev	Description	Date	By	Chkd

**Glanville**
Survey > Plan > Engineer

 Civil Engineering

 Structural Engineering

 Transport Planning

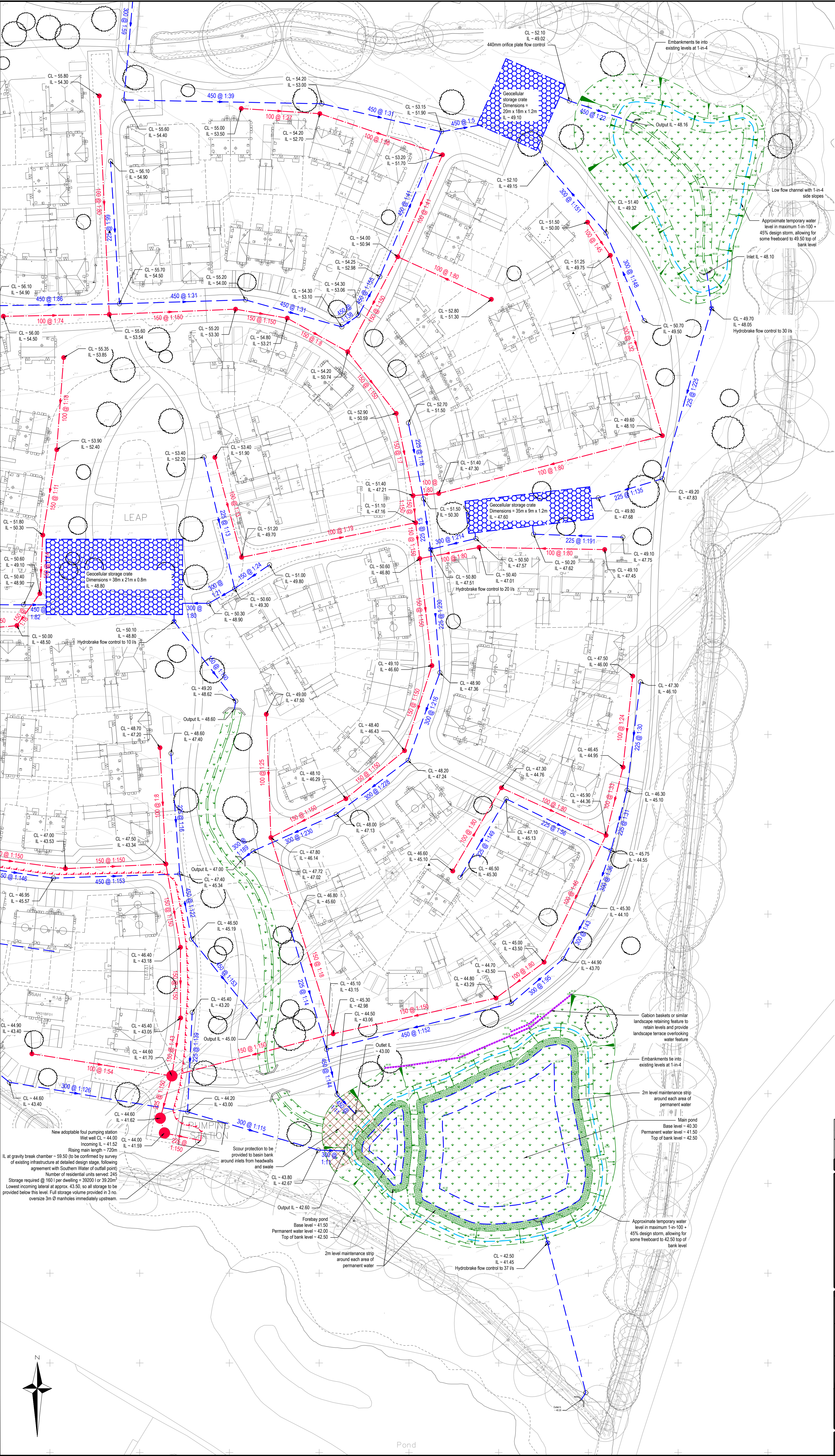
 Highways Engineering

 Building Surveying

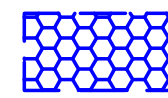
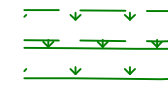
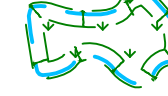
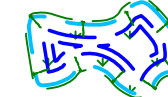
 Geomatics

 Hertfordshire |  Oxfordshire |  Cambridgeshire |  Bristol

Client:	Bloor Homes		
Project:	Land at Mortimers Lane Fair Oak		
Title:	Indicative Drainage Strategy Sheet 3		
Engineer:	LM	Date:	Aug 2024
Director:	AJ	Scale:	1:500
Status:	PLANNING		
Drawing No.	8230679/1003		Rev P2



- NOTES**
1. This drawing to be read in conjunction with all relevant documents and specifications.
 2. Dimensions to be scaled for planning purposes only.
 3. Proposed site layout taken from Pegasus Group drawing P23-2261_DE_100_C Testing Layout.
 4. Topographical survey taken from Silteline drawing 01MK001 Site Survey.
 5. All drainage to be installed in accordance with building regulations part H and BS8582.
 6. Proposed levels shown on this drawing are based on the existing ground levels of the site and are indicative only. Levels will need to be reviewed at detailed design once site layout is fixed.

- KEY:**
-  300 @ 1:46 Proposed surface water sewer and manhole
 -  150 @ 1:46 Proposed foul water sewer and manhole
 -  Proposed foul water rising main
 -  Proposed geocellular attenuation tank, dimensions and levels as described
 -  Proposed conveyance and filtration swale with 1-in-4 side slopes
 -  Proposed dry attenuation basin, details and levels as shown
 -  Proposed wet pond with attenuation volume above permanent water level

P2	Updated following client comments and issued for planning.	23/10/24	LM	KR
P1	For review and comment.	04/09/24	LM	KR
Rev	Description	Date	By	Chkd



Glanville
Survey > Plan > Engineer

 Civil Engineering

 Structural Engineering

 Transport Planning

 Highways Engineering

 Building Surveying

 Geomatics

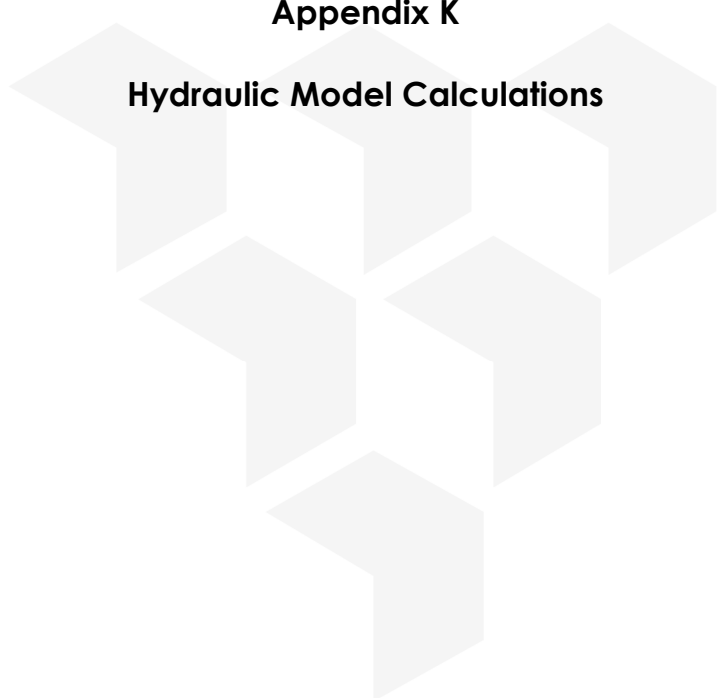
 Hertfordshire

 Oxfordshire

 Cambridgeshire

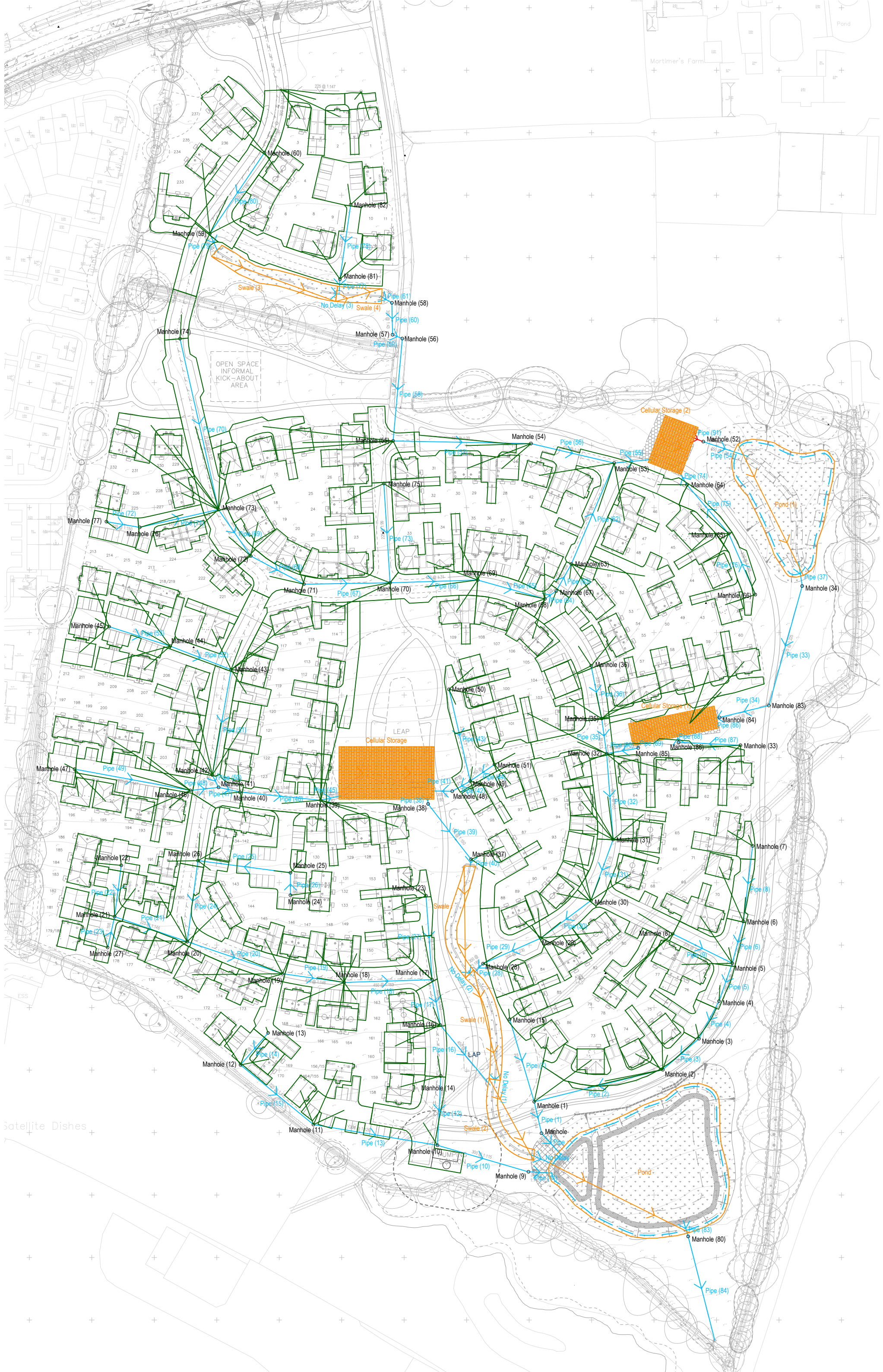
 Bristol

Client:	Bloor Homes		
Project:	Land at Mortimers Lane Fair Oak		
Title:	Indicative Drainage Strategy Sheet 4		
Engineer:	LM	Date:	Aug 2024
Director:	AJ	Scale:	1:500
Status:	PLANNING		
Drawing No.	8230679/1004		Rev P2



Appendix K

Hydraulic Model Calculations



Project:	Date: 22/08/2024			
	Designed by: LMoxon	Checked by:	Approved By:	
Report Details: Type: Inflows Storm Phase: Phase	Company Address:			



Catchment Area

Type : Catchment Area

Area (ha)	0.014
-----------	-------

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.900
Winter Volumetric Runoff	0.950
Time of Concentration (mins)	5
Percentage Impervious (%)	100



Catchment Area (1)

Type : Catchment Area

Area (ha)	0.006
-----------	-------

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.900
Winter Volumetric Runoff	0.950
Time of Concentration (mins)	5
Percentage Impervious (%)	100



Catchment Area (2)

Type : Catchment Area

Area (ha)	0.023
-----------	-------

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.900
Winter Volumetric Runoff	0.950
Time of Concentration (mins)	5
Percentage Impervious (%)	100



Catchment Area (3)

Type : Catchment Area

Area (ha)	0.005
-----------	-------

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.900
Winter Volumetric Runoff	0.950
Time of Concentration (mins)	5
Percentage Impervious (%)	100

Project:	Date: 22/08/2024			
	Designed by: LMoxon	Checked by:	Approved By:	
Report Details: Type: Inflows Storm Phase: Phase	Company Address:			


Catchment Area (4)
Type : Catchment Area

Area (ha)	0.007
-----------	-------

Dynamic Sizing	
Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.900
Winter Volumetric Runoff	0.950
Time of Concentration (mins)	5
Percentage Impervious (%)	100


Catchment Area (5)
Type : Catchment Area

Area (ha)	0.021
-----------	-------

Dynamic Sizing	
Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.900
Winter Volumetric Runoff	0.950
Time of Concentration (mins)	5
Percentage Impervious (%)	100


Catchment Area (6)
Type : Catchment Area

Area (ha)	0.024
-----------	-------

Dynamic Sizing	
Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.900
Winter Volumetric Runoff	0.950
Time of Concentration (mins)	5
Percentage Impervious (%)	100


Catchment Area (7)
Type : Catchment Area

Area (ha)	0.037
-----------	-------

Dynamic Sizing	
Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.900
Winter Volumetric Runoff	0.950
Time of Concentration (mins)	5
Percentage Impervious (%)	100

Project:	Date: 22/08/2024			
	Designed by: LMoxon	Checked by:	Approved By:	
Report Details: Type: Inflows Storm Phase: Phase	Company Address:			


Catchment Area (8)
Type : Catchment Area

Area (ha)	0.014
-----------	-------

Dynamic Sizing	
Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.900
Winter Volumetric Runoff	0.950
Time of Concentration (mins)	5
Percentage Impervious (%)	100


Catchment Area (9)
Type : Catchment Area

Area (ha)	0.054
-----------	-------

Dynamic Sizing	
Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.900
Winter Volumetric Runoff	0.950
Time of Concentration (mins)	5
Percentage Impervious (%)	100


Catchment Area (10)
Type : Catchment Area

Area (ha)	0.011
-----------	-------

Dynamic Sizing	
Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.900
Winter Volumetric Runoff	0.950
Time of Concentration (mins)	5
Percentage Impervious (%)	100


Catchment Area (11)
Type : Catchment Area

Area (ha)	0.022
-----------	-------

Dynamic Sizing	
Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.900
Winter Volumetric Runoff	0.950
Time of Concentration (mins)	5
Percentage Impervious (%)	100

Project:	Date: 22/08/2024			
	Designed by: LMoxon	Checked by:	Approved By:	
Report Details: Type: Inflows Storm Phase: Phase	Company Address:			



Catchment Area (12)

Type : Catchment Area

Area (ha)	0.019
-----------	-------

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.900
Winter Volumetric Runoff	0.950
Time of Concentration (mins)	5
Percentage Impervious (%)	100



Catchment Area (13)

Type : Catchment Area

Area (ha)	0.036
-----------	-------

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.900
Winter Volumetric Runoff	0.950
Time of Concentration (mins)	5
Percentage Impervious (%)	100



Catchment Area (14)

Type : Catchment Area

Area (ha)	0.008
-----------	-------

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.900
Winter Volumetric Runoff	0.950
Time of Concentration (mins)	5
Percentage Impervious (%)	100



Catchment Area (15)

Type : Catchment Area

Area (ha)	0.073
-----------	-------

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.900
Winter Volumetric Runoff	0.950
Time of Concentration (mins)	5
Percentage Impervious (%)	100

Project:	Date: 22/08/2024			
	Designed by: LMoxon	Checked by:	Approved By:	
Report Details: Type: Inflows Storm Phase: Phase	Company Address:			



Catchment Area (16)

Type : Catchment Area

Area (ha)	0.017
-----------	-------

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.900
Winter Volumetric Runoff	0.950
Time of Concentration (mins)	5
Percentage Impervious (%)	100



Catchment Area (17)

Type : Catchment Area

Area (ha)	0.011
-----------	-------

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.900
Winter Volumetric Runoff	0.950
Time of Concentration (mins)	5
Percentage Impervious (%)	100



Catchment Area (18)

Type : Catchment Area

Area (ha)	0.025
-----------	-------

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.900
Winter Volumetric Runoff	0.950
Time of Concentration (mins)	5
Percentage Impervious (%)	100



Catchment Area (19)

Type : Catchment Area

Area (ha)	0.018
-----------	-------

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.900
Winter Volumetric Runoff	0.950
Time of Concentration (mins)	5
Percentage Impervious (%)	100

Project:	Date: 22/08/2024			
	Designed by:	Checked by:	Approved By:	
Report Details: Type: Inflows Storm Phase: Phase	LMoxon			
	Company Address:			



Catchment Area (20)

Type : Catchment Area

Area (ha)	0.021
-----------	-------

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.900
Winter Volumetric Runoff	0.950
Time of Concentration (mins)	5
Percentage Impervious (%)	100



Catchment Area (21)

Type : Catchment Area

Area (ha)	0.017
-----------	-------

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.900
Winter Volumetric Runoff	0.950
Time of Concentration (mins)	5
Percentage Impervious (%)	100



Catchment Area (22)

Type : Catchment Area

Area (ha)	0.074
-----------	-------

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.900
Winter Volumetric Runoff	0.950
Time of Concentration (mins)	5
Percentage Impervious (%)	100



Catchment Area (23)

Type : Catchment Area

Area (ha)	0.022
-----------	-------

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.900
Winter Volumetric Runoff	0.950
Time of Concentration (mins)	5
Percentage Impervious (%)	100

Project:	Date: 22/08/2024			
	Designed by: LMoxon	Checked by:	Approved By:	
Report Details: Type: Inflows Storm Phase: Phase	Company Address:			



Catchment Area (24)

Type : Catchment Area

Area (ha)	0.009
-----------	-------

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.900
Winter Volumetric Runoff	0.950
Time of Concentration (mins)	5
Percentage Impervious (%)	100



Catchment Area (25)

Type : Catchment Area

Area (ha)	0.01
-----------	------

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.900
Winter Volumetric Runoff	0.950
Time of Concentration (mins)	5
Percentage Impervious (%)	100



Catchment Area (26)

Type : Catchment Area

Area (ha)	0.016
-----------	-------

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.900
Winter Volumetric Runoff	0.950
Time of Concentration (mins)	5
Percentage Impervious (%)	100



Catchment Area (27)

Type : Catchment Area

Area (ha)	0.013
-----------	-------

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.900
Winter Volumetric Runoff	0.950
Time of Concentration (mins)	5
Percentage Impervious (%)	100

Project:	Date: 22/08/2024			
	Designed by: LMoxon	Checked by:	Approved By:	
Report Details: Type: Inflows Storm Phase: Phase	Company Address:			



Catchment Area (28)

Type : Catchment Area

Area (ha)	0.01
-----------	------

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.900
Winter Volumetric Runoff	0.950
Time of Concentration (mins)	5
Percentage Impervious (%)	100



Catchment Area (29)

Type : Catchment Area

Area (ha)	0.004
-----------	-------

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.900
Winter Volumetric Runoff	0.950
Time of Concentration (mins)	5
Percentage Impervious (%)	100



Catchment Area (30)

Type : Catchment Area

Area (ha)	0.032
-----------	-------

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.900
Winter Volumetric Runoff	0.950
Time of Concentration (mins)	5
Percentage Impervious (%)	100



Catchment Area (31)

Type : Catchment Area

Area (ha)	0.007
-----------	-------

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.900
Winter Volumetric Runoff	0.950
Time of Concentration (mins)	5
Percentage Impervious (%)	100

Project:	Date: 22/08/2024			
	Designed by: LMoxon	Checked by:	Approved By:	
Report Details: Type: Inflows Storm Phase: Phase	Company Address:			



Catchment Area (32)

Type : Catchment Area

Area (ha)	0.01
-----------	------

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.900
Winter Volumetric Runoff	0.950
Time of Concentration (mins)	5
Percentage Impervious (%)	100



Catchment Area (33)

Type : Catchment Area

Area (ha)	0.008
-----------	-------

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.900
Winter Volumetric Runoff	0.950
Time of Concentration (mins)	5
Percentage Impervious (%)	100



Catchment Area (34)

Type : Catchment Area

Area (ha)	0.033
-----------	-------

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.900
Winter Volumetric Runoff	0.950
Time of Concentration (mins)	5
Percentage Impervious (%)	100



Catchment Area (35)

Type : Catchment Area

Area (ha)	0.029
-----------	-------

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.900
Winter Volumetric Runoff	0.950
Time of Concentration (mins)	5
Percentage Impervious (%)	100

Project:	Date: 22/08/2024			
	Designed by: LMoxon	Checked by:	Approved By:	
Report Details: Type: Inflows Storm Phase: Phase	Company Address:			


Catchment Area (36)
Type : Catchment Area

Area (ha)	0.007
-----------	-------

Dynamic Sizing	
Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.900
Winter Volumetric Runoff	0.950
Time of Concentration (mins)	5
Percentage Impervious (%)	100


Catchment Area (37)
Type : Catchment Area

Area (ha)	0.023
-----------	-------

Dynamic Sizing	
Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.900
Winter Volumetric Runoff	0.950
Time of Concentration (mins)	5
Percentage Impervious (%)	100


Catchment Area (38)
Type : Catchment Area

Area (ha)	0.026
-----------	-------

Dynamic Sizing	
Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.900
Winter Volumetric Runoff	0.950
Time of Concentration (mins)	5
Percentage Impervious (%)	100


Catchment Area (39)
Type : Catchment Area

Area (ha)	0.022
-----------	-------

Dynamic Sizing	
Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.900
Winter Volumetric Runoff	0.950
Time of Concentration (mins)	5
Percentage Impervious (%)	100

Project:	Date: 22/08/2024			
	Designed by: LMoxon	Checked by:	Approved By:	
Report Details: Type: Inflows Storm Phase: Phase	Company Address:			



Catchment Area (40)

Type : Catchment Area

Area (ha)	0.017
-----------	-------

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.900
Winter Volumetric Runoff	0.950
Time of Concentration (mins)	5
Percentage Impervious (%)	100



Catchment Area (41)

Type : Catchment Area

Area (ha)	0.02
-----------	------

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.900
Winter Volumetric Runoff	0.950
Time of Concentration (mins)	5
Percentage Impervious (%)	100



Catchment Area (42)

Type : Catchment Area

Area (ha)	0.069
-----------	-------

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.900
Winter Volumetric Runoff	0.950
Time of Concentration (mins)	5
Percentage Impervious (%)	100



Catchment Area (43)

Type : Catchment Area

Area (ha)	0.009
-----------	-------

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.900
Winter Volumetric Runoff	0.950
Time of Concentration (mins)	5
Percentage Impervious (%)	100

Project:	Date: 22/08/2024			
	Designed by: LMoxon	Checked by:	Approved By:	
Report Details: Type: Inflows Storm Phase: Phase	Company Address:			


Catchment Area (44)
Type : Catchment Area

Area (ha)	0.028
-----------	-------

Dynamic Sizing	
Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.900
Winter Volumetric Runoff	0.950
Time of Concentration (mins)	5
Percentage Impervious (%)	100


Catchment Area (45)
Type : Catchment Area

Area (ha)	0.018
-----------	-------

Dynamic Sizing	
Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.900
Winter Volumetric Runoff	0.950
Time of Concentration (mins)	5
Percentage Impervious (%)	100


Catchment Area (46)
Type : Catchment Area

Area (ha)	0.023
-----------	-------

Dynamic Sizing	
Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.900
Winter Volumetric Runoff	0.950
Time of Concentration (mins)	5
Percentage Impervious (%)	100


Catchment Area (47)
Type : Catchment Area

Area (ha)	0.035
-----------	-------

Dynamic Sizing	
Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.900
Winter Volumetric Runoff	0.950
Time of Concentration (mins)	5
Percentage Impervious (%)	100

Project:	Date: 22/08/2024			
	Designed by: LMoxon	Checked by:	Approved By:	
Report Details: Type: Inflows Storm Phase: Phase	Company Address:			



Catchment Area (48)

Type : Catchment Area

Area (ha)	0.024
-----------	-------

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.900
Winter Volumetric Runoff	0.950
Time of Concentration (mins)	5
Percentage Impervious (%)	100



Catchment Area (49)

Type : Catchment Area

Area (ha)	0.042
-----------	-------

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.900
Winter Volumetric Runoff	0.950
Time of Concentration (mins)	5
Percentage Impervious (%)	100



Catchment Area (50)

Type : Catchment Area

Area (ha)	0.026
-----------	-------

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.900
Winter Volumetric Runoff	0.950
Time of Concentration (mins)	5
Percentage Impervious (%)	100



Catchment Area (51)

Type : Catchment Area

Area (ha)	0.016
-----------	-------

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.900
Winter Volumetric Runoff	0.950
Time of Concentration (mins)	5
Percentage Impervious (%)	100