

Clopton Hall, Rattlesden, Suffolk, IP30 0RN

Reference: 429 FRA- 001

Jul-23

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FLOOD RISK ASSESSMENTS &
DRAINAGE STRATEGIES

Flood Risk Assessment

Clopton Hall, Rattlesden, Suffolk, IP30 0RN

Reference: 429 FRA- 001

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All Environment Agency mapping data used under special license. Data is current as the data on the correspondence given by the Environment Agency and is subject to change.

The information presented and conclusions drawn are based on statistical data and are for guidance purposes only.

The study provides no guarantee against flooding of the study site or elsewhere, nor of the absolute accuracy of water levels, flow rates and associated probabilities.

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Purpose of this report

- 1.1 RIDA Reports Ltd has been appointed to undertake a Level 2 – Scoping Study Flood Risk Assessment for a development located at IP30 ORN.

Objectives

- 1.2 The objectives of this FRA are to demonstrate the following:
- * Whether the proposed development is likely to be affected by current or future flooding.
 - * Whether the proposed development will increase flood risk elsewhere.
 - * Whether the flood risks associated with the proposed development can be satisfactorily managed.
 - * Whether the measures proposed to deal with the flood risk are sustainable.

Documents Consulted

- 1.3 To achieve these objectives the following documents have been consulted and/or referenced:

The National Planning Policy Framework (NPPF)
CIRIA C753 document The SuDS Manual, 2015
Local Flood Risk Management Strategy (LFRMS)
Level 1 Strategic Flood Risk Assessment (SFRA)
Aerial photographs and topographical survey of the site
British Geological Society Records
Local Council flood Maps
Environment Agency flood maps
The CIRIA publication 'C635 Designing for exceedance in urban drainage— Good practice'

Development Site and Location

- 2.1 The site is located at Green Rd, Rattlesden. The nearest post code is IP30 0RN. Refer to appendix A for site location plan.
- 2.2 The current use of the site is a group of outbuildings . The current use vulnerability clasification of the site is Less vulnerable . The site is located in the River Flood Zone 1. Refer to Appendix B for more details.

Development Proposals

- 2.3 The proposed development includes the the refurbishment and renewal at Clopton Hall, the construction of garages. The total development area (shown in within the red line) is approximately 16500 sqm. Refer to Appendix B for layout of the proposed development.
- 2.4 The vulnerability classification of the proposed development is More vulnerable with an estimated lifetime between 50 and 100 years.

Site Hydrology and Hydrogeology

- | | | |
|------------------------|-----|---|
| Hydrology | 2.5 | The River Rat is located approximately 530 m away from the development. |
| Aquifer | 2.6 | The development is located within a secondary undifferentiated aquifer. The aquifer's layer in question has previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type. |
| Source Protection Zone | 2.7 | The site is located within a source protection zone 3. This zone is defined as the area around a source within which all groundwater recharge is presumed to be discharged at the source. |
| Groundwater Levels | 2.8 | The ground water levels for this site are unknown. |

Site Geology

- | | | |
|----------------------|------|--|
| Bedrock | 2.9 | The British Geological Society records of the site show that it is located within the Crag Group - Sand. |
| Superficial Deposits | 2.10 | The British Geological Society records show that the superficial deposits are Lowestoft Formation - Diamicton. |

National Planning Policy Framework (NPPF)

- 3.1 The NPPF and its technical guidance is a set of planning policies with the key objective to contribute to the achievement of sustainable development. As part of it, they ensure that flood risk and sustainability are taken into account during the planning process. This ensures that developments are not located in flood risk areas and directs developments to lower risk areas. The NPPF applies a sequential risk-based approach to determining the suitability of land for development in flood risk areas. The NPPF also encourages developers to seek opportunities to reduce the overall level of flood risk through the layout of the development and the application of Sustainable Drainage Systems (SuDS).

The Flood and Water Management Act (2010)

- 3.2 The Flood and Water Management Act aims to reduce the flood risk associated with extreme weather events. It provides a robust management of flood risk for people, homes and businesses and also encourages the use of SuDS for developments. A robust SuDS strategy should take into account the recommendations given in this Flood Risk Assessment.

Strategic Flood Risk Assessment (SFRA)

- 3.3 Planning policy with regard to development and flood risk in the area is detailed in the Strategic Flood Risk Assessment (SFRA) which was published in 2020. The proposed development site is located within the administrative boundary of the Babergh & Mid Suffolk .
- 3.4 The SFRA commits to direct new development to locations at lowest flood risk. The SFRA provides information on the levels and flood hazards that could result from flooding. The Environment Agency flood zone maps and the SFRA ignore the presence of existing flood defences when defining the potential extent of flooding.
- 3.5 This report follows the guidance given in the Strategic Flood Risk Assessment by evaluating the flood risk and providing relevant flood mitigation.

- 4.1 The flood risks were determined by identifying the sources of flooding and assessing their possible impact and likelihood to the development.

Fluvial Flood Risk Assessment

- 4.2 Fluvial flood risk was assessed using the Environment Agency Flood Zone Maps and the sequential risk-based approach recommended in the NPPF. The sequential test takes into account the flood risk vulnerability of land uses in relation to the flood zone categorisation. These parameters are assessed in order to determine whether the development is appropriate. Under certain circumstances the exception test is applicable.

Sequential Approach

Step 1
Flood Zone categorisation

- 4.3 The proposed development is greater than 1Ha and falls within the Environment Agency Flood Zone 1. Therefore, a Site Specific Flood Risks Assessment is required under the NPPF. The Flood Zone 1 is considered to have a low probability of flooding with an annual probability of flooding of <0.1%. The chance of flooding is 1 in 1000 years or greater.

Step 2
Flood risk vulnerability

- 4.4 Within Table 2 (Flood Risk Vulnerability Classification) of the NPPF Planning Practice Guide, the proposed development is classified as 'More vulnerable'.

Step 3
Sequential Test Results

- 4.5 The Flood Risk vulnerability and Flood Zone Compatibility table of the NPPF Planning Practice Guide states that More vulnerable developments are appropriate in this area.

The Exception Test

- 4.6 The exception test is not required.

- 5.1 The development has been assessed for all potential flood risks such as river and tidal flood risk, surface water flooding, flooding from groundwater, reservoir flood risk and drainage systems.

Historic Flooding

- 5.2 The site does not benefit from flood defences. The Environment Agency records show that the area around the site has not been flooded in the past.

Flooding from river and sea

- 5.3 The proposed development is greater than 1Ha and falls within the Environment Agency Flood Zone 1. Therefore, a Site Specific Flood Risks Assessment is required under the NPPF. The Flood Zone 1 is considered to have a low probability of flooding with an annual probability of flooding of <0.1%. The chance of flooding is 1 in 1000 years or greater.
- 5.4 The climate change allowance is not applicable for this site as it is not affected by fluvial flood risk.

Surface water (overland flows) flood risk

5.5 The Environment Agency maps show that the flood risk from surface water is very low. A residual risk of localised ponding remains unlikely. The Environment Agency surface water flood risk maps are defined through application of a specific procedure based on digital terrain models and assumptions regarding losses to infiltration and/or urban drainage. The surface water flood maps is defined by the Environment Agency as follows.

5.6 *"The nationally produced surface water flood mapping only indicates where surface water flooding could occur as a result of local rainfall. It does not fully represent flooding that occurs from:*

- Ordinary watercourses*
- Drainage systems or public sewers caused by catchment-wide rainfall events*
- Rivers*
- Groundwater*

Due to the modelling techniques used, the mapping picks out depressions in the ground surface and simulates some flow along natural drainage channels, rivers, low areas in floodplains, and flow paths between buildings. Although the maps appear to show flooding from ordinary watercourses, they should not be taken as definitive mapping of flood risk from these as the conveyance effect of ordinary watercourses or drainage channels is not explicitly modelled. Also, structures (such as bridges, culverts and weirs) and flood risk management infrastructure (such as defences) are not represented.

The nationally produced surface water flood mapping does not take account of the effect of pumping stations in catchments with pumped drainage. No allowance is made for tide locking, high tidal or fluvial levels where sewers cannot discharge in to rivers or the sea."

5.7 The strategic flood risk for the Babergh & Mid Suffolk confirms that the flood risk for the site is Very Low.

5.8 On the basis of Environment Agency and the Strategic flood risk assessment's surface water mapping, together with the presence of surface water drainage systems at the site and surrounding area it is concluded that the site is at Very Low risk of flooding from surface water sources.

Flooding from drainage systems in adjacent areas

- 5.9 The council records have been reviewed. The flooding from drainage incidents maps were not found in the Strategic Flood Risk Assessment. Therefore, for the purpose of this report, it has been assumed that the risk of flooding from drainage systems is low.

Reservoirs Risks

- 5.10 The Reservoir Flood Map (RFM) produced by the Environment Agency do not show the risk to individual properties of dam breach flooding. The maps do not indicate or relate to any particular probability of dam breach flooding. The maps were prepared for emergency planning purposes and can be used to help reservoir owners produce on-site plans and the Local Resilience Forum produce off-site plans, and to prioritise areas for evacuation/early warning in the event of a potential dam failure. The RFM shows that the development could be outside of the possible dam breach flooding path. See Appendix C.

Groundwater flood risk

- 5.11 The British Geological Survey's flood risk susceptibility maps show that the development has limited susceptibility to ground water flooding. The risk from groundwater flood to the site is considered very low. Refer to appendix C for record drawings.

Critical Drainage Areas

- 5.12 The Strategic Flood Risk Assessment was reviewed as part of this assessment. However, it does not show the critical drainage areas within the council. For the purpose of this report, it has been assumed that the site is outside of a notified critical drainage area.

- 6.1 The Flood hazard assessment has demonstrated that the site is:
 - In Flood Zone 1
 - At Very Low risk of surface flooding
 - At very low risk of groundwater flooding
 - Outside of a critical drainage area
 - Outside of an area with sewer flooding

- 6.2 Under the NPPF it is necessary to demonstrate that, for any new development on the site, it is possible to provide an adequate level of flood protection for personnel working or living at the development. The development is not affected by flooding therefore no flood protection is required.

7.1 The NPPF specifically stipulates that consideration should be given to potential off-site flood impacts of any proposed development. These off-site impacts are in relation to:

- Surface water management
- Flood flow conveyance, storage and climate change

Surface Water Management

7.2 The surface water run-off will be disposed using SuDS techniques. The aim is to provide a sustainable design that accommodates the proposed attenuation volume and replicated the existing drainage regime using the SuDS hierarchy is shown in the figure below.

7.3 The SuDS techniques highlighted in red below could be used on site. This assessment is based on the ground conditions and the potential discharge points available.

The SuDS Hierarchy (Source:EA Thames region, SuDS a practical guide)

Most Sustainable	SuDS technique	Flood Reduction	Pollution Reduction	Landscape & Wildlife Benefit
↑ ↓	Living roofs	✓	✓	✓
	Basins and ponds - Constructed wetlands - Balancing ponds - Detention basins - Retention ponds	✓	✓	✓
	Filter strips and swales	✓	✓	✓
	Infiltration devices - soakaways - infiltration trenches and basins	✓	✓	✓
	Permeable surfaces and filter drains - gravelled areas - solid paving blocks - porous paviers	✓	✓	✓
Least Sustainable	Tanked systems - over-sized pipes/tanks - storms cells	✓		

7.4 With no increase in the rate of surface water discharge from the site, compared to the site in its current configuration, the proposed development would have no adverse impact on surface water flood risk at the site or surrounding area. The SuDS should be designed at detailed project stage.

- 8.1 It is concluded that the site can be developed in accordance with the provisions of the NPPF and the requirements of the Environment Agency and the local planning authority.

- 8.2 This report demonstrates that the proposal will be safe, in terms of flood risk, for its design life and will not increase the flood risk elsewhere.

Appendix A



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Rev.	Date	Dwn.	Description
0	21/09/22	EBZ	Planning Issue

Legend

— Site Area

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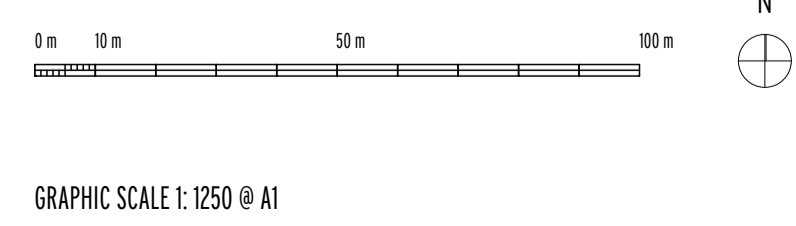
Client:
Mr Moody & Dr Dormer
 35 Leighton Road
 London
 NW5 2QG

Project:
**Clopton Hall, Rattlesden,
 Suffolk,
 IP30 0RN**

Status:
PLANNING

Drawing:
Location Plan

Scale(s)	Date	Dwn by	Chd by
1:1250 @ A1	18/04/2023	ebz	
Project No:	Drawing No:	Revision:	
2124	001	0	



Appendix B

Legend

- Items to be demolished
- Removed plants, hedges & trees
- Existing plants & hedges
- Existing gravel
- Site Area



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Rev.	Date	Dwn.	Description
0	21/09/22	EBZ	Planning Issue
1	15.11.2022	ebz	Issued for planning
2	27.06.2023	ebz	Issued for planning

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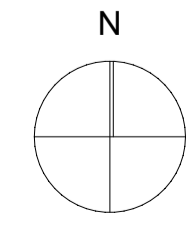
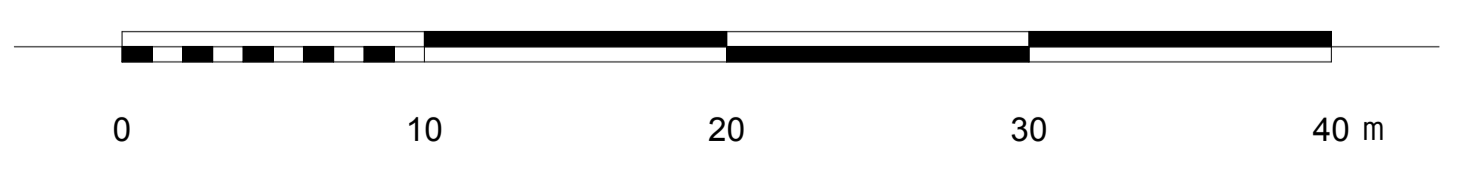
Client:
Mr Moody & Dr Dormer
 35 Leighton Road
 London
 NW5 2QG

Project:
**Clopton Hall, Rattlesden,
 Suffolk,
 IP30 0RN**

Status: **PLANNING**

Drawing: **Exiting Landscape Plan**

Scale(s)	Date	Dwn by	Chd by
1:250 @ A1	27/06/2023	ebz	
Project No:	Drawing No:	Revision:	
2124	100	2	



Legend

- Proposed plants & hedges
- Existing plants & hedges
- Proposed gravel
- Proposed stone paving to match existing
- Existing Construction
- New Construction
- Site Area



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Rev.	Date	Dwn.	Description
0	21/09/22	EBZ	Planning Issue
2	30/05/23	EBZ	Planning Issue

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Status:
PLANNING

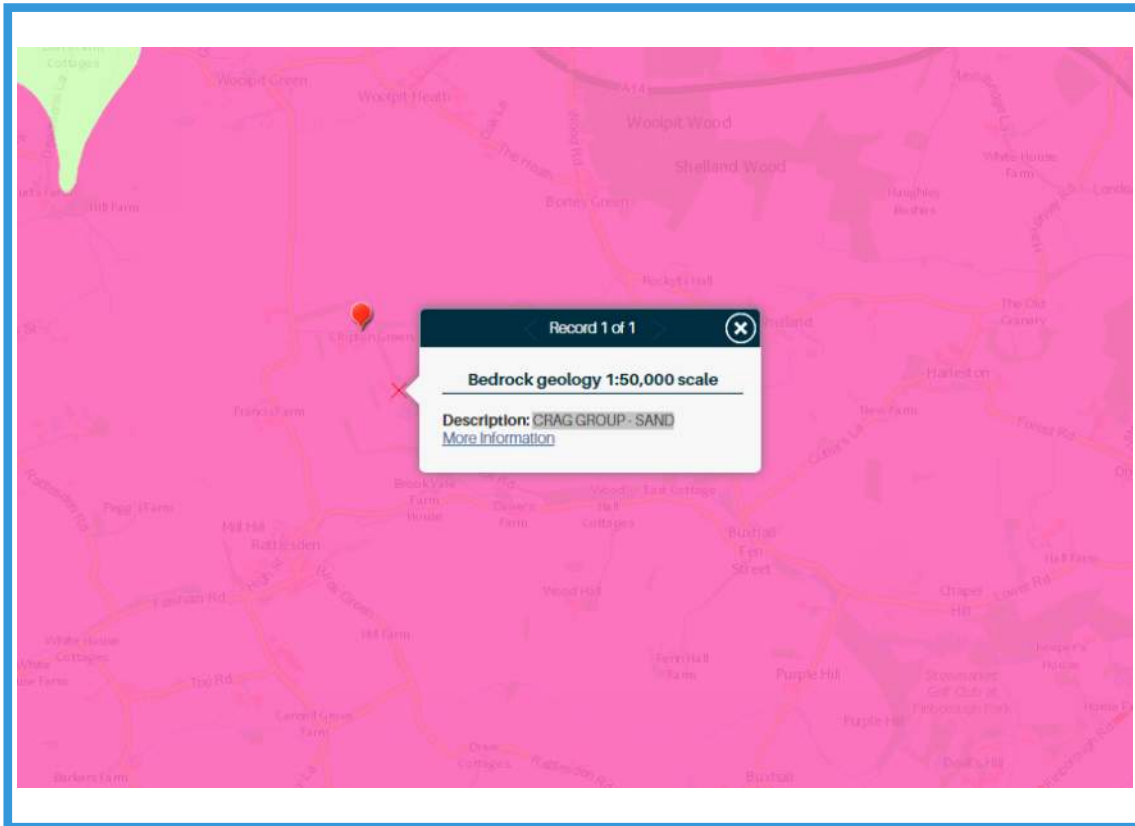
Drawing:
Proposed Landscape Plan

Scale(s)	Date	Dwn by:	Chd by:
1:250 @ A1	03/07/2023	ebz	
Project No:	Drawing No:	Revision:	
2124	2000	2	

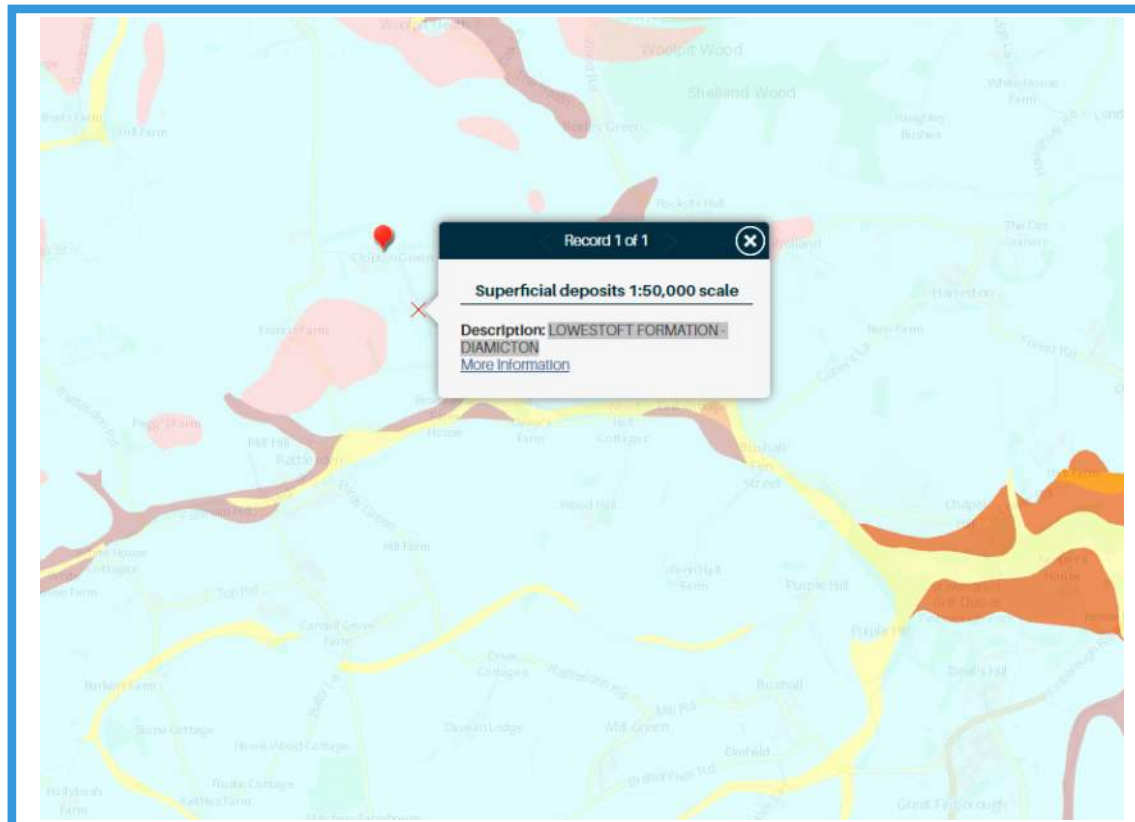
Appendix C



GEOLOGY - BEDROCK - CRAG GROUP - SAND

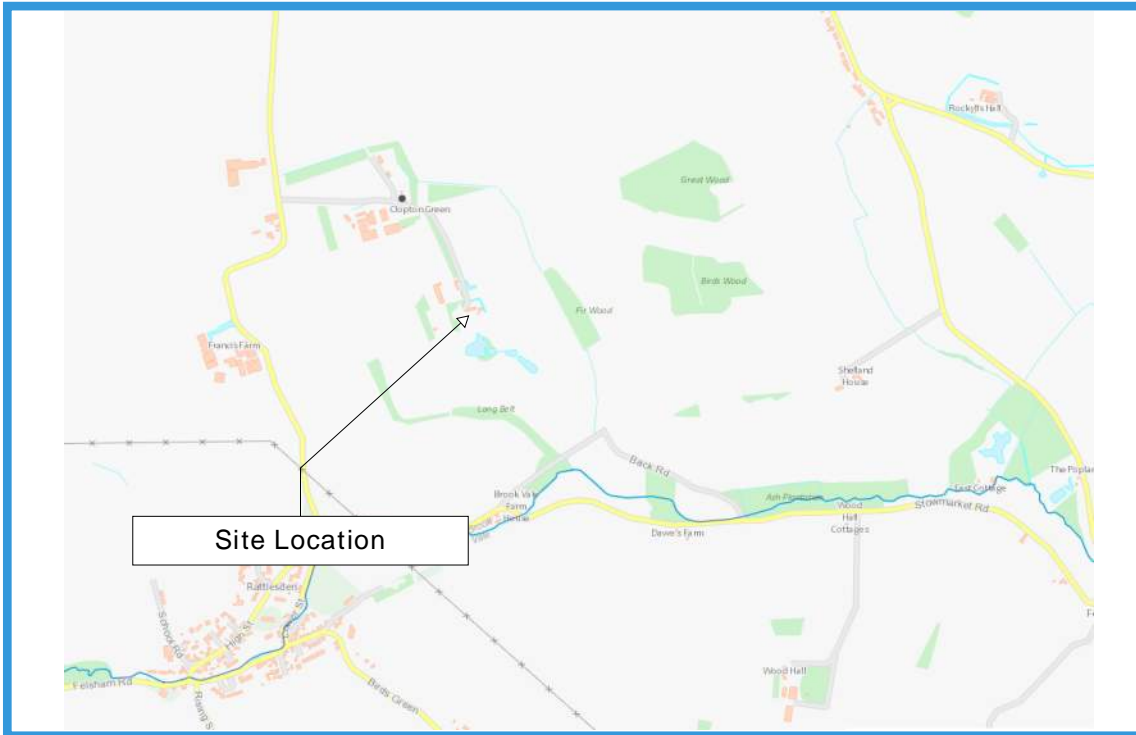


GEOLOGY - SUPERFICIAL DEPOSITS - LOWESTOFT FORMATION - DIAMICTON





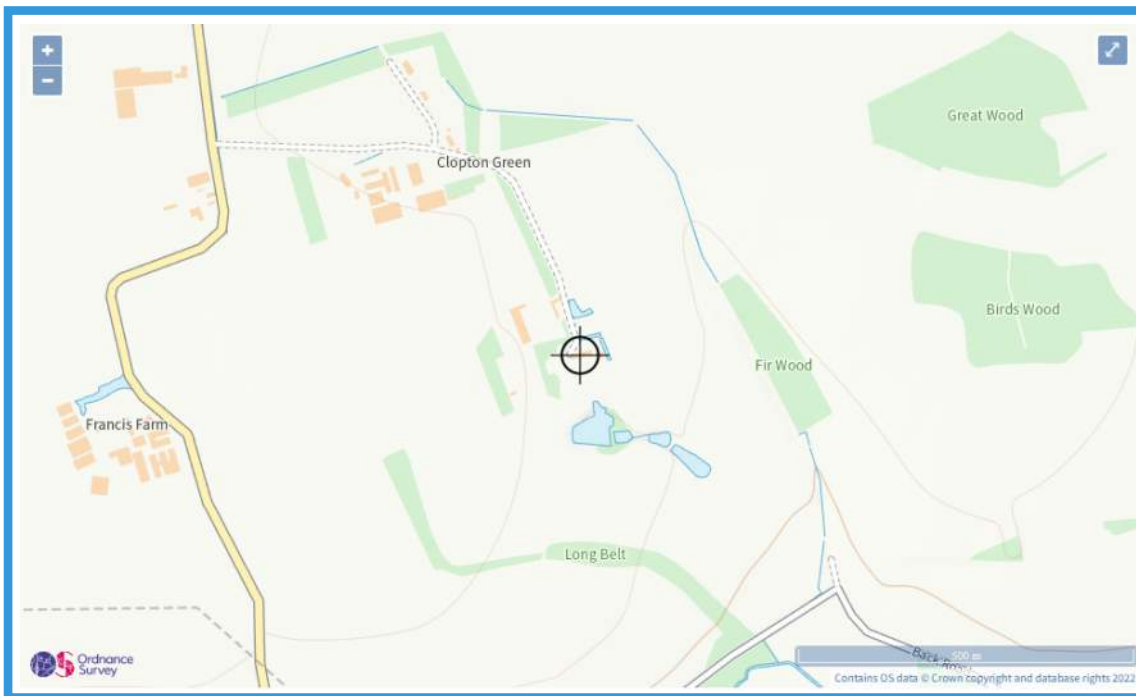
Main River Map



Flood risk from reservoirs



Extent of flooding



when river levels are normal



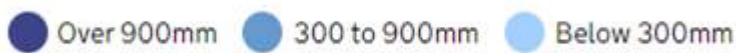
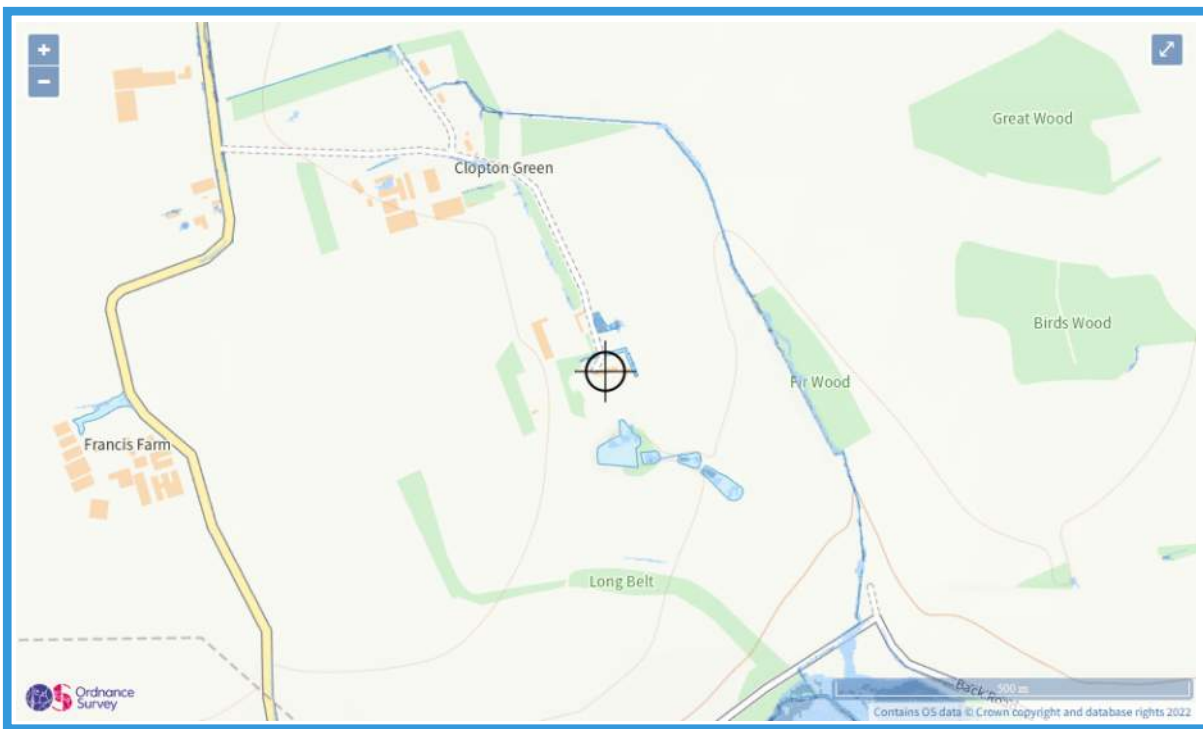
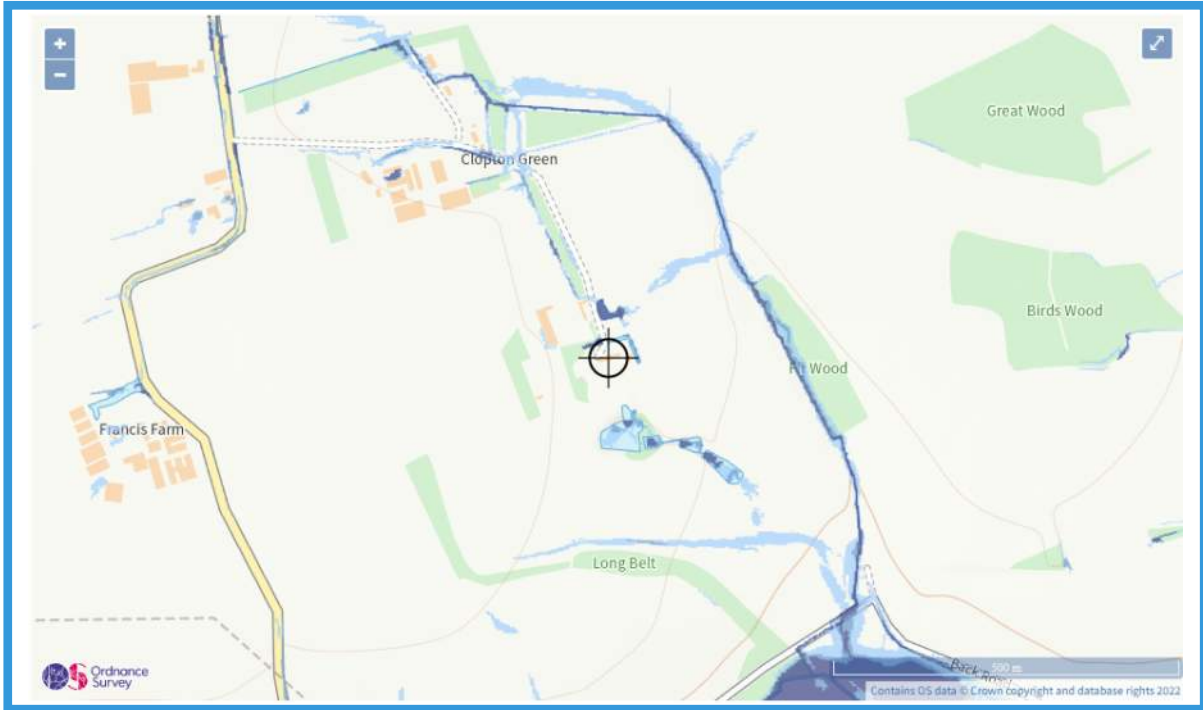
when there is also flooding from rivers

SITE SURFACE WATER FLOOD RISK

High risk means a chance of flooding greater than 3.3% (1:30)
 Medium risk means a chance of flooding of btw 1% (1:100) and 3.3%
 Low risk means a chance of flooding of btw 0.1% (1:1000) and 1%
 Flooding from surface water is difficult to predict as rainfall location and volume are difficult to forecast. In addition, local features can greatly affect the chance and severity of flooding

Flood risk from surface water

Extent of flooding





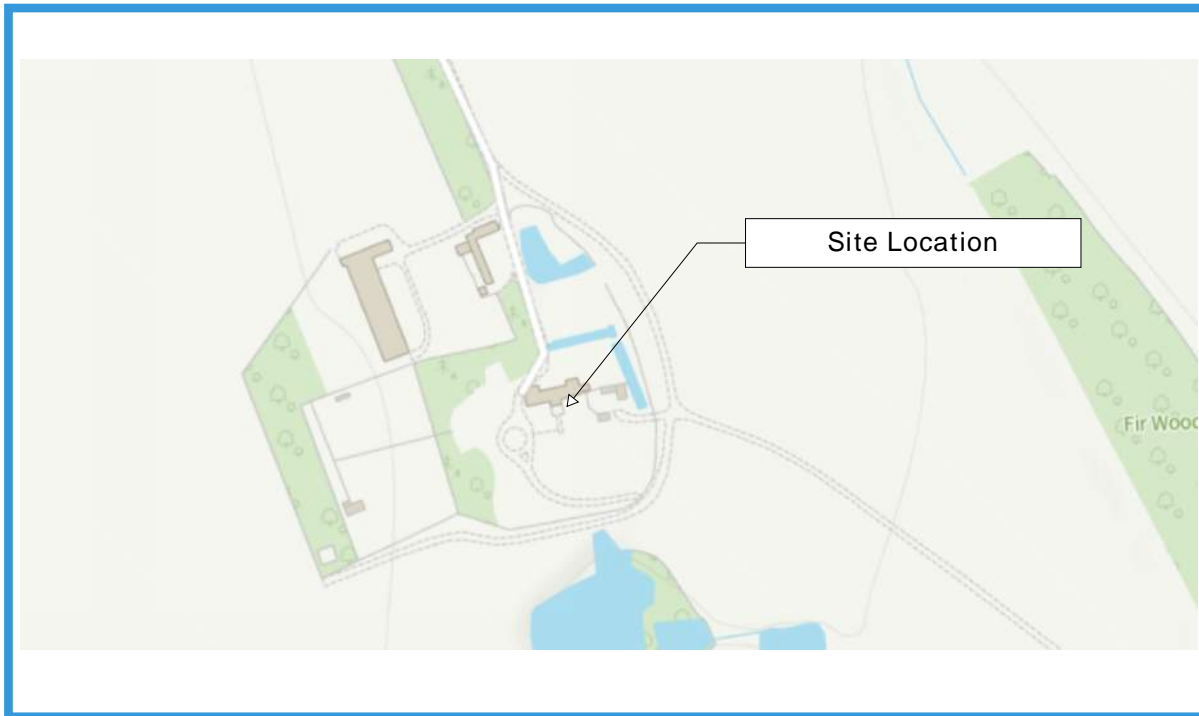
Site Check Results
✕

Site Check Report Report generated on Sun Oct 09 2022
You selected the location: Centroid Grid Ref: TL98375993
 The following features have been found in your search area:

Source Protection Zones merged (England)	
Zone	3
Aquifer Designation Map (Bedrock) (England)	
Typology	Principal
Aquifer Designation Map (Superficial Drift) (England)	
Typology	Secondary (undifferentiated)

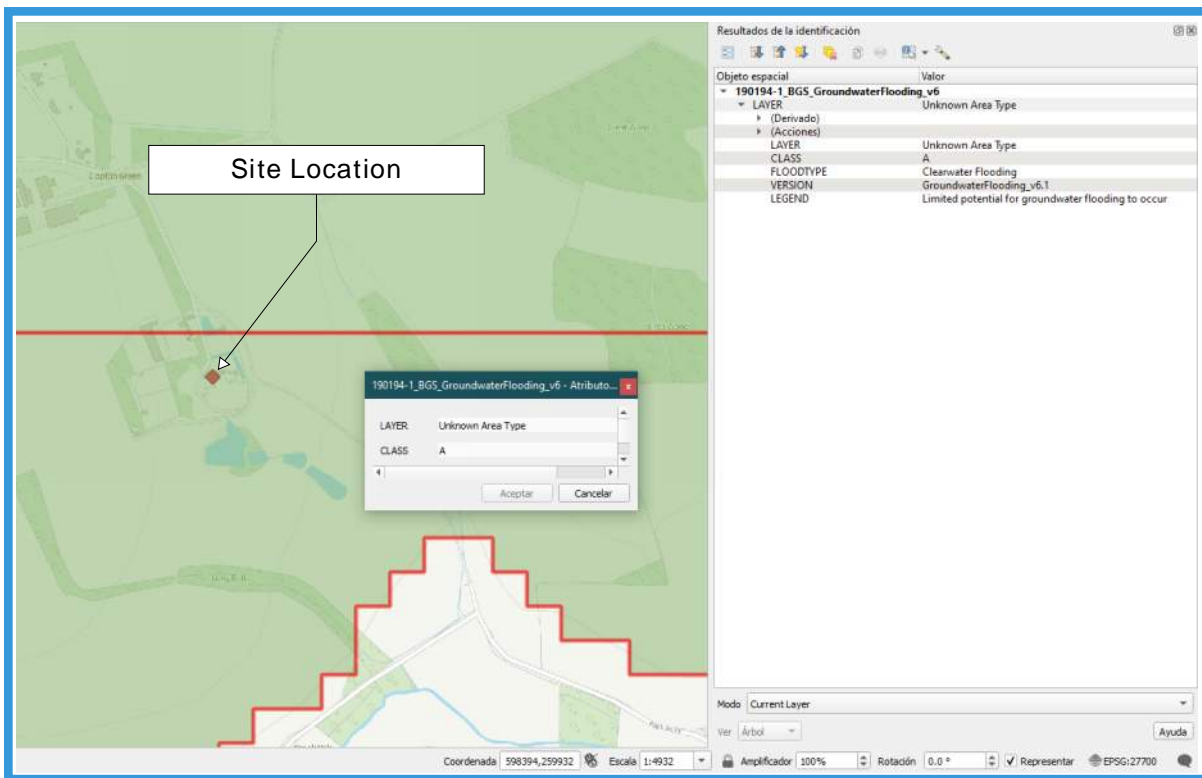
OK Cancel Export to CSV Print

FLOOD WARNING AREA

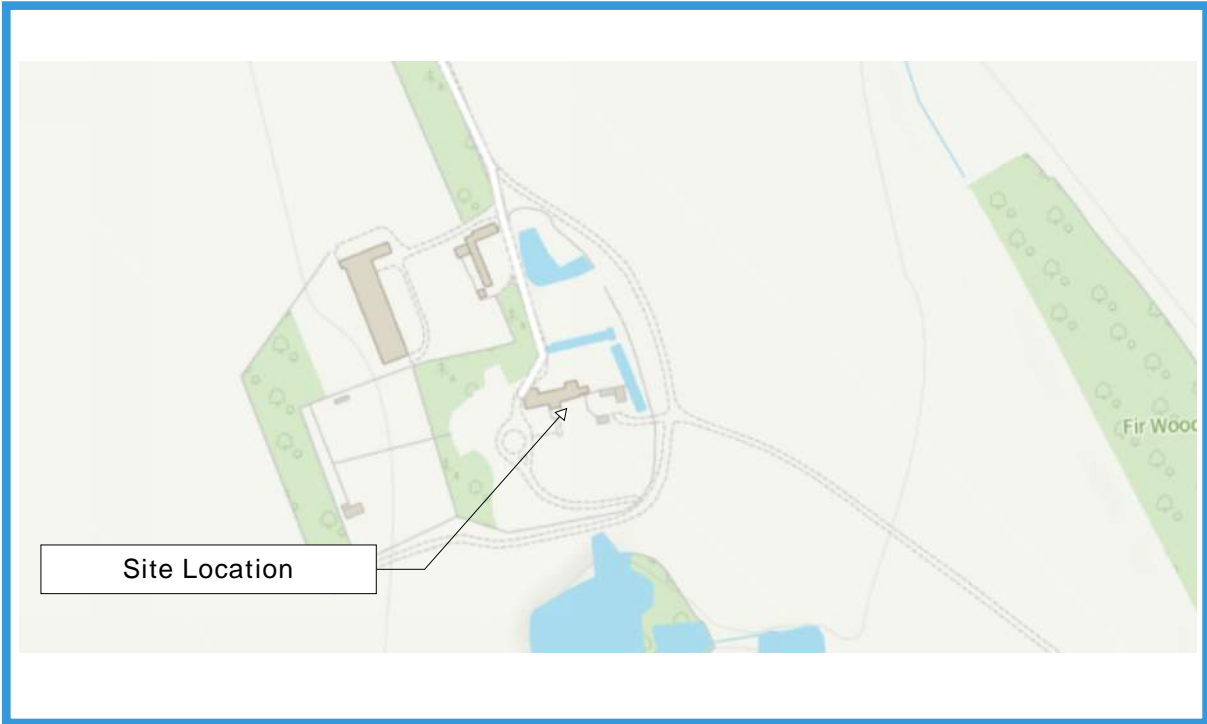


Flood Warning areas

GROUND WATER FLOOD RISK



HISTORIC FLOOD MAP



● Historic Flood Outline

Flood map for planning

Your reference
IP30 0RN

Location (easting/northing)
598408/259929

Created
10 Oct 2022 10:00

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 2021 OS 100024198. <https://flood-map-for-planning.service.gov.uk/os-terms>

Flood map for planning

Your reference

IP30 0RN

Location (easting/northing)

598408/259929


Scale

1:2500

Created

10 Oct 2022 10:00



-  Selected point
-  Flood zone 3
-  Flood zone 3: areas benefiting from flood defences
-  Flood zone 2
-  Flood zone 1
-  Flood defence
-  Main river
-  Water storage area

