FLOOD RISK ASSESSMENTS & DRAINAGE STRATEGIES

Land at Darenth Fishing Complex, Kent, DA2 7QY

Reference: 585 FRA- 001

FLOOD RISK ASSESSMENT

Nov-23

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	Section
Introduction	**1**
Site Assessment	**2**
National and Local Planning Policy	**3**
The Sequential and Exception Test	**4**
Flood hazard assessment	**5**
Flood Risk Management	**6**
Off-site Impacts	**7**
Residual Risk	**8**
Conclusions	**9**
Appendices	
Site Location Plan	**A**
Existing and Proposed Site Layouts	**B**
Site Characteristics	**C**
Environment Agency Data	**D**

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FLOOD RISK ASSESSMENTS &
DRAINAGE STRATEGIES

Flood Risk Assessment

Land at Darenth Fishing Complex, Kent, DA2 7QY

Reference: 585 FRA- 001

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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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Introduction 1

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 DA2 7QY.

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 Darenth Hill, Darenth, Sutton at Hone, Dartford. The nearest post code is DA2 7QY. Refer to appendix A for site location plan.

2.2 The current use of the site is a greenfield. The current use vulnerability clasification of the site is Water compatible. The site is located in the River Flood Zone 2. Refer to Appendix B for more details.

Development Proposals

2.3 The proposed development includes the construction of a a touring caravan site. 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 Darent is located approximately 10 m away from the development.

Aquifer

2.6 The development is located within a secondary aquifer type A. Aquifers type A consist of permeable layers capable of supporting water supplies at a local rather than strategic scale. They are generally aquifers formerly classified as minor aquifers.

Source Protection Zone

2.7 The site is located within a source protection zone 1. This zone is defined as the 50 day travel time from any point below the water table to the source. This zone has a minimum radius of 50 metres around 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 Lewes Nodular Chalk Formation, Seaford Chalk Formation and Newhaven Chalk Formation (Undifferentiated) - Chalk.

Superficial Deposits

2.10 The British Geological Society records show that the superficial deposits are Taplow Gravel Member - Sand and Gravel.

National and Local Planning Policy 3

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 Level 1 and 2 Strategic Flood Risk Assessment (L1&2 SFRA) which was published in 2021. The proposed development site is located within the administrative boundary of the Dartford Borough Council .

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 Level 1 and 2 Strategic Flood Risk Assessment by evaluating the flood risk and providing relevant flood mitigation.

The Sequential and Exception Test 4

4.1 The NPPF guidance states that the sequential test "is designed to ensure that areas at little or no risk of flooding from any source are developed in preference to areas at higher risk. This means avoiding, so far as possible, development in current and future medium and high flood risk areas considering all sources of flooding including areas at risk of surface water flooding."

Applicability of the Sequential Test

4.2 The flood risks were determined by identifying all the sources of flooding and assessing their possible impact and likelihood to the development. It is confirmed that the development is:

- In Flood Zone 2 as per map for planning
- In Flood Zone 1 based on the EA product 4 information and latest river modelling
- At Very Low risk of surface flooding
- At high risk of groundwater flooding
- Outside of a critical drainage area
- Outside of an area with sewer flooding

4.3 Due to the flood risk on the development, a sequential test is required for this site. This development is located in flood zone 1 (as confirmed by the product 4 information), and it is potentially affected by groundwater flooding. However, the site is located at high ground (16m AOD), making it difficult for groundwater to affect the area. The proposal has been located at the lowest flood risk level available within the site. It is unlikely that there may be any reasonably available sites in areas with a lower probability of groundwater flooding that would be appropriate to accommodate the type of development or land use proposed.

Exception Test

4.4 Fluvial flood risk was assessed using the Environment Agency Flood Zone Maps and the sequential risk-based approach recommended in the NPPF guidance. The exception test requirement 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 requires an exception test or it is not appropriate.

Step 1
Flood Zone categorisation

4.5 The proposed development falls within The Environment Agency Flood Zone 2. The Flood Zone 2 is considered to have a medium probability of flooding with a 1000 to 100 years annual probability or 0.1-1.0%AEP.

Step 2
Flood risk vulnerability

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

Step 3
Flood Zone incompatibility

4.7 The Flood Risk vulnerability and Flood Zone incompatibility table of the NPPF Planning Practice Guide states that More vulnerable developments do not require an exception test in this area.

The Exception Test

4.8 The exception test is not required.

Flood hazard assessment 5

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 shows that the area around the site has potentially been flooded in the past. See appendix C for details.

Flooding from river and sea

5.3 The proposed development falls within The Environment Agency Flood Zone 2. The Flood Zone 2 is considered to have a medium probability of flooding with a 1000 to 100 years annual probability or 0.1-1.0%AEP.

5.4 The climate change allowances are as per the vulnerability of the development , the design life of the building , and the flood zone classification. The climate change allowance for this development is 10%. The nearest climate change allowance provided by the Environment Agency has been taken to complete this assessment.

5.5 The levels provided by the Environment Agency are shown in table 1 below. Further details are provided in appendix D.

Flood Levels at site

Return Period	Flood Level (m AOD)
1 in 30 (3.33%)	Nil
1 in 100 (1%)	Nil
1 in 100 + 25%(CC)	Nil
1 in 1000 (0.1%)	Nil

Flood Levels near the site

Return Period	Flood Level (m AOD)
1 in 30 (3.33%)	14.908
1 in 100 (1%)	15.013
1 in 100 + 25%(CC)	15.103
1 in 1000 (0.1%)	15.44

5.6 The site is located at a level of 16.00, the site is located above all the flood event level. The flood risk level taken to complete this assessment is: 15.103m AOD. This is the 1 in 100 + 25%(CC) level. This level is 897mm below the site. In conclusion the site is located in flood zone 1.

Surface water (overland flows) flood risk

5.7 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.

5.8 *"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."

5.9 The strategic flood risk for the Dartford Borough Council confirms that the flood risk for the site is Very Low.

5.10 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

5.11 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

5.12 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 within the possible dam breach flooding path. See Appendix C.

Groundwater flood risk

5.13 The British Geological Survey's flood risk susceptibility maps show that the development has potential for groundwater flooding above ground level. Groundwater levels would tend to vary seasonally and are influenced by ground and meteorological conditions and proximity to water features. The groundwater flooding risk for this site is considered to be high. Refer to appendix C for record drawings.

Critical Drainage Areas

5.14 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 based on the EA product 4 information and latest river modelling
- At Very Low risk of surface flooding
- At high 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.

Flood Protection

6.3 The general precautionary measures to mitigate the risk of groundwater flooding in this development are:

- All new caravans must be at least 200mm above the existing ground level.

- Ground floor threshold levels of the showers and toilets are proposed to be raised a minimum of 200mm above ground level as freeboard to allow for uncertainty. It is proposed to add a tanking membrane upto 200mm above the ground level.

- Provide flow paths around the proposed development, which groundwater will take in the event of groundwater emergence.

- All service entries should be sealed (e.g. with expanding foam or similar closed-cell material). Closed cell insulation should be used for all pipes

- Services and fittings (communications wiring, heating systems, electrical services, water, electricity and gas meters) should be placed 200mm above the ground level.

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 paviors	✓	✓	
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.

Flood Flow conveyance and storage

7.5 Due to the size of the development and its location on the flood zone, flood compensation for this development is not required.

Residual Risk 8

8.1 This flood risk assessment has identified the potential flooding mechanisms that could affect the site. This assessment has concluded that the development site requires additional flood risk mitigation strategies so all the flood risk can addressed.

Site access and public safety

8.2 This assessment has demonstrated that the proposed development will have no adverse impact on flood risk in the area surrounding the site. Available evidence indicates that the development would result in no change in surface water generation. There is therefore no basis to indicate that, with respect to flood risk, the proposed development would have adverse impact on public safety.

8.3 It will be necessary to ensure that all building users are fully informed of procedures to be implemented during threat of imminent flooding.

Flood Warning and evacuation

8.4 The site is located within an area that is covered by the Environment Agency Flood Alert service. It is recommended that the proposed development is registered with this service to receive early warning of imminent flood hazard.

8.6 The occupants of the site are encouraged to sign up to the alerts and should use these to form an appropriate Flood Management and Evacuation Plan tailored to their operations prior to occupation of the site. Table 4 below shows the actions that will be taken for each flood warning.

8.7 Action to be taken in the event of Alarm being Raised or Flood Warning Received:

a. Raise the alarm and evacuate the site following the established Fire Drill procedures. The main assembly as per the main house fire drill assembly point.

b. Contact Emergency Fire Services (999) if necessary and/or Environment Agency Floodline: (0845 988 1188) if event was not expected.

c. If safe to do so, locate and turn off key services e.g. water, gas & electricity.

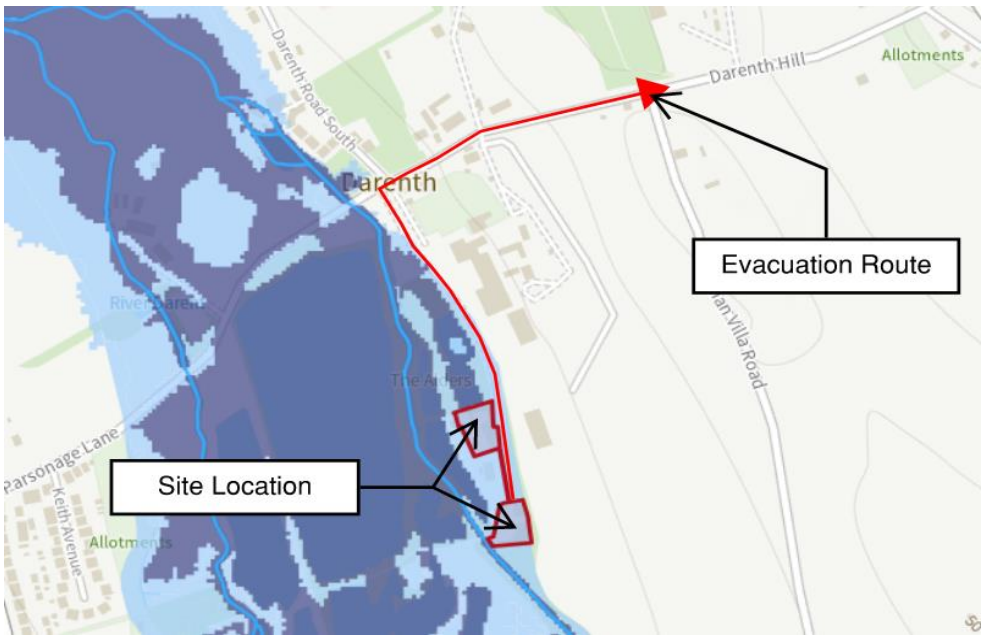
d. Follow the routes below to evacuate the site completely.

Actions that will be taken for each flood warning

Warning	Message	Timing	Action
 FLOOD ALERT	Flooding is possible. Be prepared.	2 hours to 2 days in advance of flooding.	- Be prepared for flooding. - Prepare a flood kit.
 FLOOD WARNING	Flooding is expected. Immediate action required.	Half an hour to 1 day in advance of flooding.	- Act now to protect your property. - Block doors with flood boards or sandbags and cover airbricks and other ventilation holes. - Move pets and valuables to a safe place. - Keep a flood kit ready. - Move any critical equipment and information to a safe location
 SEVERE FLOOD WARNING	Severe flooding. Danger to life.	When flooding poses a significant threat to life and different actions are required.	- Be ready should you need to evacuate from the property. - Co-operate with the emergency services and call 999 if you are in immediate danger.
Warning Removed	No further flooding is currently expected for your area.	Issued when a flood warning is no longer in force.	- Flood water may still be around and could be contaminated. - If you've been flooded, ring your buildings and contents insurance company as soon as possible.

8.8 Safe egress is achievable by following Darenth Hill, which is shown to be beyond the extent of flooding. See figure below for details.

Evacuation Route



Conclusions 9

9.1 It is concluded that subject to the proposed mitigation measures, 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.

9.2 It is proposed that a formal Flood Warning and Emergency Response Plan is developed for the proposed development to communicate flood emergency response procedures to all the occupants of the site.

9.3 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

AERIAL VIEW 1:1250

SITE A

SITE B

556085 , 171009

556123 , 170897

Path (um)
Darenth Court Farm
Court Lodge
Church
Depot
Darenth Fishing Complex
F.B
Pond
River Darent
Lake
DARENTH HILL
Mill Bungalow
Old Mill Farm
Path
PARSONAGE LANE
BM 15.96m
Recreation Ground
Pavilion
Foot Bridge
Waterress Beds
Sluice
Drain
Ford
St John's Jerusalem

LOCATION PLAN 1:1250

1:1250 Scale Bar
0 10 20 30 50 100

Client:
Mr P Davis

Location:
Land at Darenth Fishing Complex
Darenth
Kent
DA2 7QY

Project:
Proposed Touring Caravan Site

LOCATION PLAN

Drawn: SRF
Checked:
Scale: 1:1250
Date: August 2023
Drawing No: 23.1001/SK05
Rev:

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RIBA
Chartered Practice
Studio on the Green
Ballards Gore Golf Club
Gore Road Canewdon Essex SS4 2DA
Telephone: (01702) 548 588
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Appendix B

Existing Lane

Location of proposed toilet + shower block.
Separate Male, Female and Accessible toilet provisions.

Toilet + Shower Block

ENTRANCE

Refuse Bin Store

Suitably sized bin store / refuse area as indicated. Located at entrance to site to allow for ease of collection.

EXISTING HOUSE

7 8 9 6 5 4 3 2 1

6000 6000 6000 6000 6000 6000

6000mm 6000mm 6000mm 6000mm

Fire Point

Location of proposed FIRE POINT.
Positioned so that no Caravan is further then 90m.
To house 2No. 10 Litre water(gas expelled) extinguishers.

Existing telegraph pole.

10 11 12 13 14 15 16

6000mm 6700mm 6000mm 6000mm 6000mm 6000mm

PROPOSED SITE A LAYOUT PLAN 1:100

1:100 Scale Bar
0 1 2 3 5 10m

REFER TO DRAWING No: 23.1001/SK02
FOR ADDITIONAL INFORMATION

Client:
Mr P Davis

Location:
Land at Darenth Fishing Complex
Darenth
Kent
DA2 7QY

Project:
Proposed Touring Caravan Site

Proposed Site Layout

Drawn: SRF
Checked:
Scale: 1:100
Date: August 2023
Drawing No: 23.1001/SK01
Rev:

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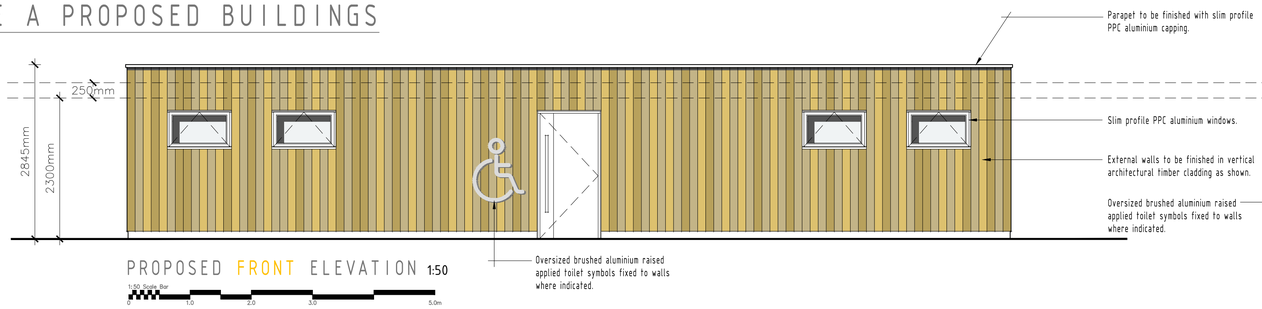
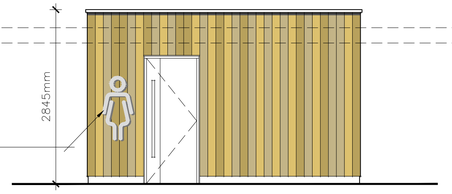
SITE A PROPOSED BUILDINGS

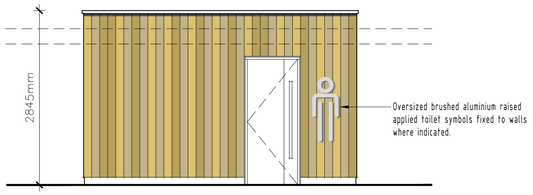


PROPOSED FRONT ELEVATION 1:50

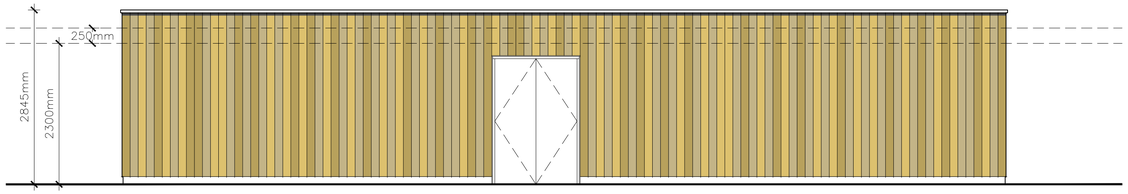
1:50 Scale Bar
0 1.0 2.0 3.0 5.0m



PROPOSED SIDE ELEVATION 1:50



PROPOSED SIDE ELEVATION 1:50

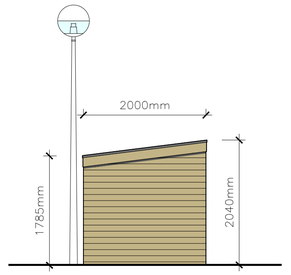


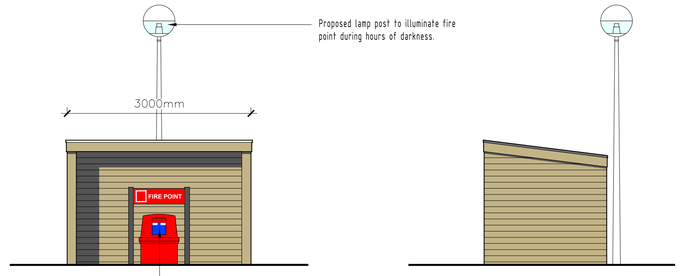
PROPOSED REAR ELEVATION 1:50

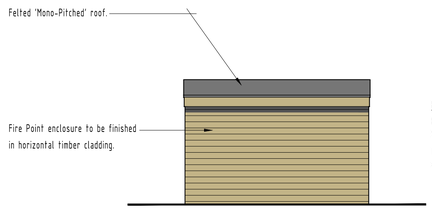
PROPOSED FLOOR PLAN 1:50

1:50 Scale Bar
0 1.0 2.0 3.0 5.0m

FIRE POINT DETAILS







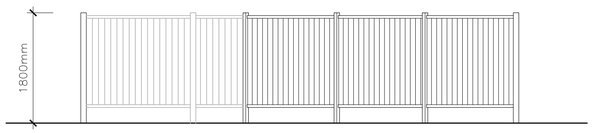
PROPOSED FIRE POINT

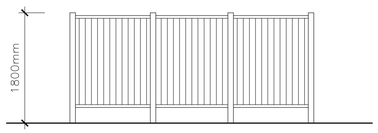
Positioned so that no Caravan is further then 90m.

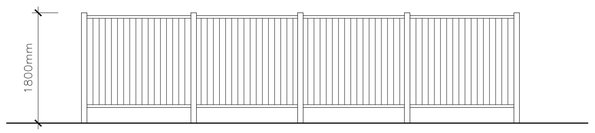
To house 2No. 10 Litre water/gas expelled/ extinguishers.

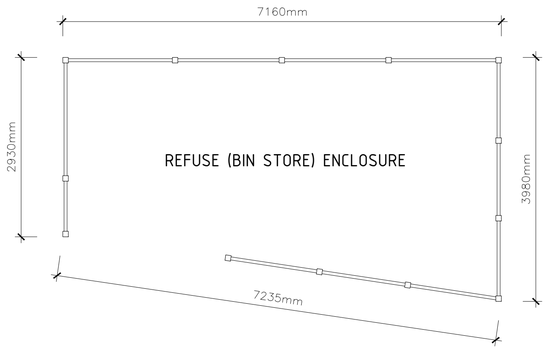
PROPOSED SIGNAGE

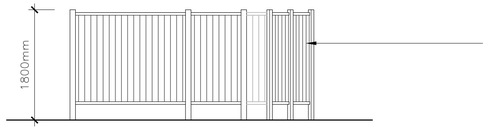
TOILET + SHOWER BLOCK DETAILS











REFUSE ENCLOSURE DETAILS

Client:
Mr P Davis

Location:
Land at Darenth Fishing Complex
Darenth
Kent
DA2 7QY

Project:
Proposed Touring Caravan Site
SITE A PROPOSED BUILDINGS

TOILET/SHOWERS, FIRE POINT + REFUSE

Drawn: SRF
Checked:
Scale: 1:100
Date: August 2023
Drawing No: 23.1001/SK02
Rev:

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Location of proposed toilet + shower block. Separate Male, Female and Accessible toilet provisions.
NB: To be constructed on existing concrete base.

6000mm

6000mm

Toilet
+
Shower Block

1 2 3 4 5 6 7

Fire Point

ENTRANCE

Suitably sized bin store / refuse area as indicated. Located at entrance to site to allow for ease of collection.

Location of proposed FIRE POINT.
Positioned so that no Caravan is further then 90m.
To house 2No. 10 Litre water(gas expelled) extinguishers.

7200mm

Refuse Bin Store

13 12 11 10 9 8

6000mm 6000mm 6000mm 6000mm 6000mm

Existing Lane

PROPOSED SITE B LAYOUT PLAN 1:100

1:100 Scale Bar
0 1 2 3 5 10m

REFER TO DRAWING No: 23.1001/SK04
FOR ADDITIONAL INFORMATION

Client:
Mr P Davis

Location:
Land at Darenth Fishing Complex
Darenth
Kent
DA2 7QY

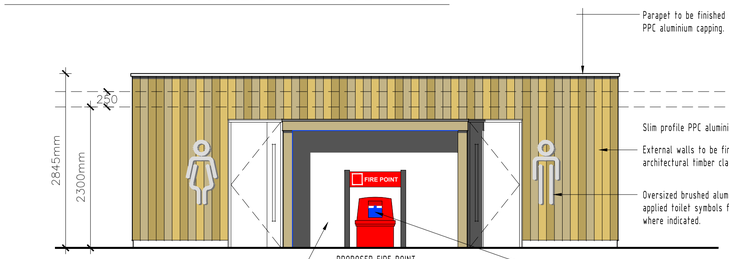
Project:
Proposed Touring Caravan Site

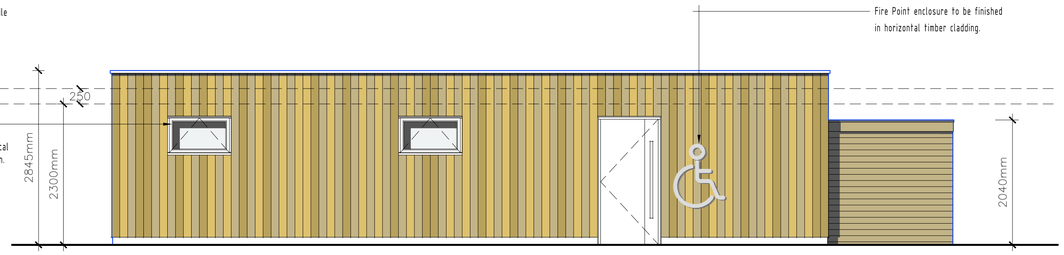
Feasibilty Layout Site B

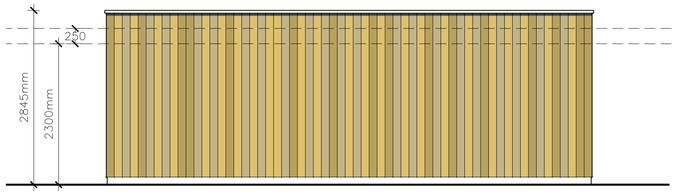
Drawn: SRF
Checked:
Scale: 1:100
Date: August 2023
Drawing No: 23.1001/SK03
Rev:

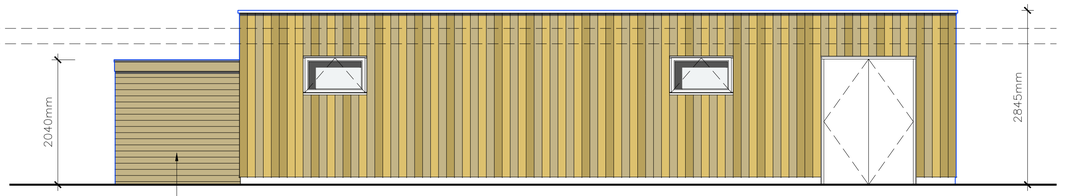
BDA ARCHITECTURE
RIBA
Chartered Practice
Studio on the Green
Ballards Gore Golf Club
Gore Road Canewdon Essex SS4 2DA
Telephone: (01702) 548 588
www.bdarchitecture.co.uk

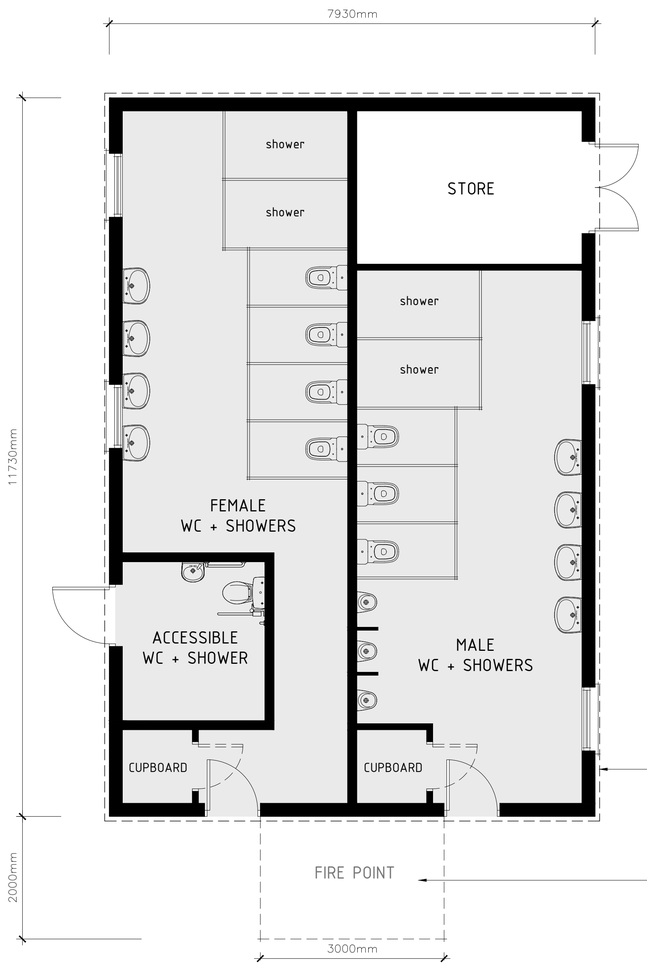
SITE B PROPOSED BUILDINGS











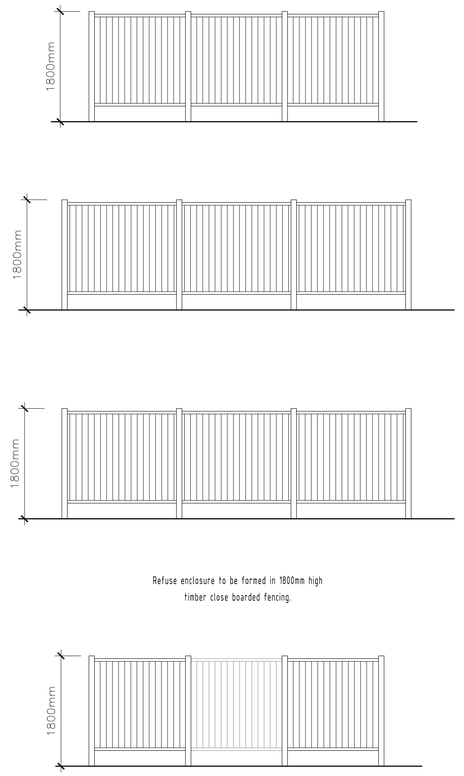
PROPOSED FLOOR PLAN 1:50

1:50 Scale Bar
0 1.0 2.0 3.0 5.0m

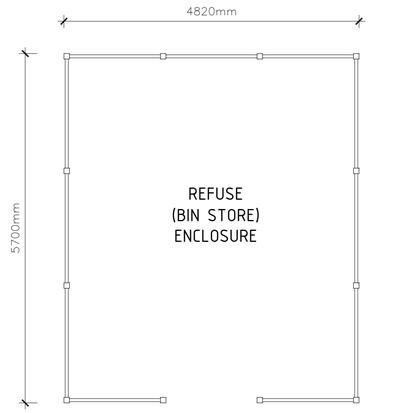
PROPOSED SIGNAGE

PROPOSED SIGNAGE

REFUSE ENCLOSURE DETAILS



Refuse enclosure to be formed in 1800mm high timber close boarded fencing.



Client: Mr P Davis

Location: Land at Darenth Fishing Complex, Darenth, Kent, DA2 7QY

Project: Proposed Touring Caravan Site
SITE B PROPOSED BUILDINGS

TOILET/SHOWERS, FIRE POINT + REFUSE

Drawn: SRF
Checked:
Scale: 1:100
Date: August 2023
Drawing No: 23.1001/SK04
Rev:

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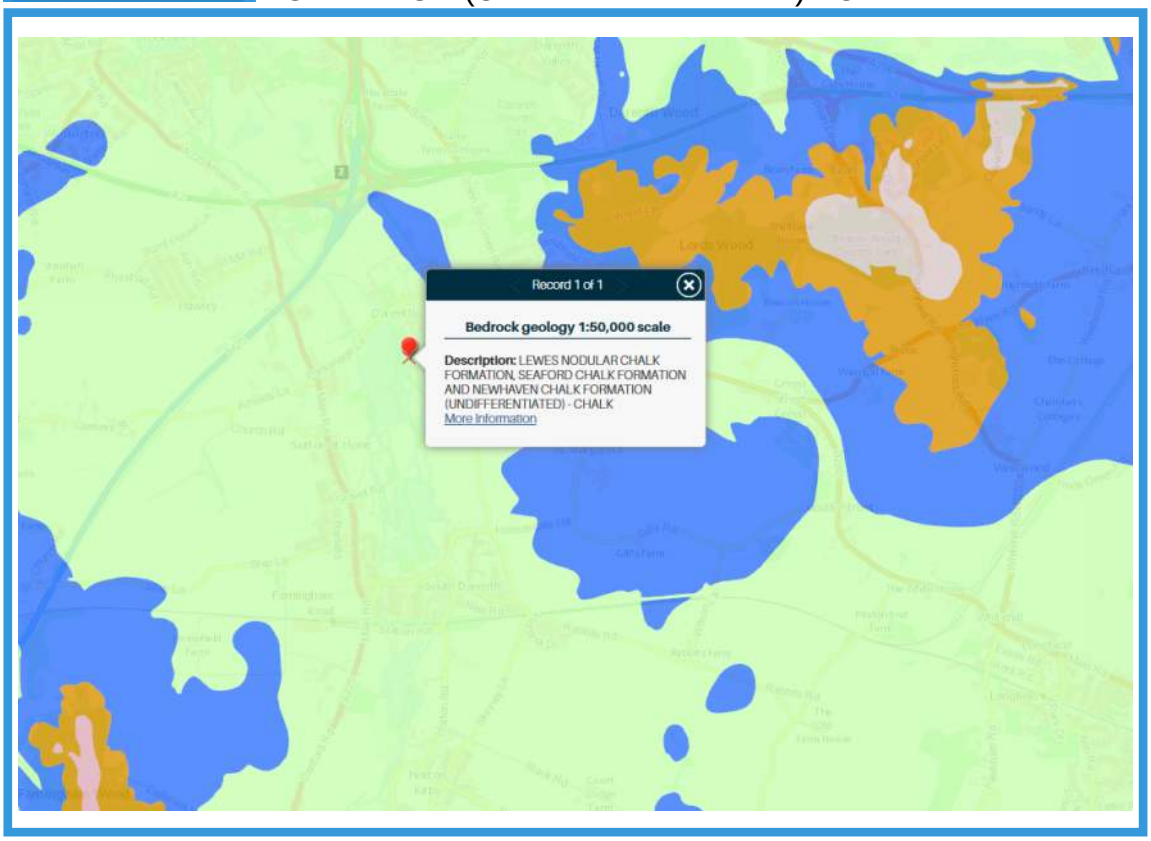
TOILET / SHOWER BLOCK + FIRE POINT DETAILS

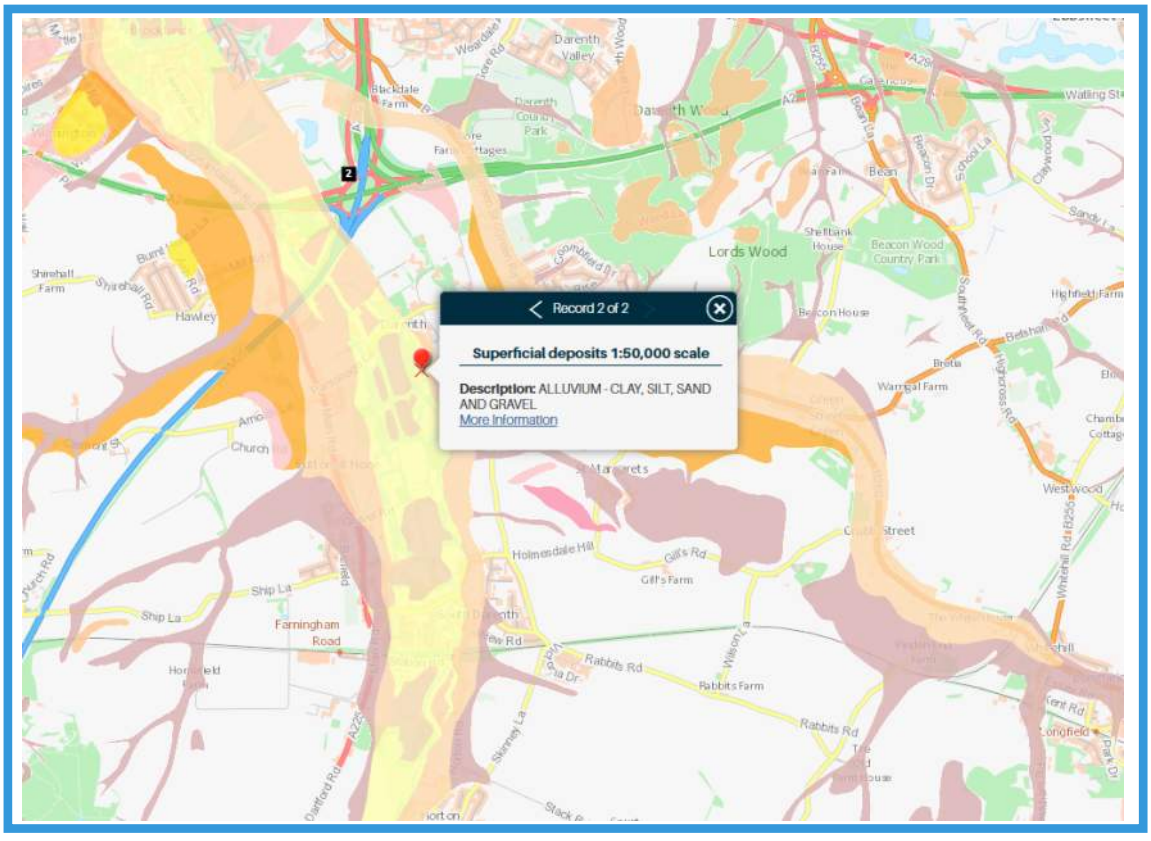
Appendix C

SITE GEOLOGY

GEOINDEX ONSHORE GEOLOGY - BEDROCK - LEWES NODULAR CHALK FORMATION, SEAFORD CHALK FORMATION AND NEWHAVEN CHALK FORMATION (UNDIFFERENTIATED) - CHALK

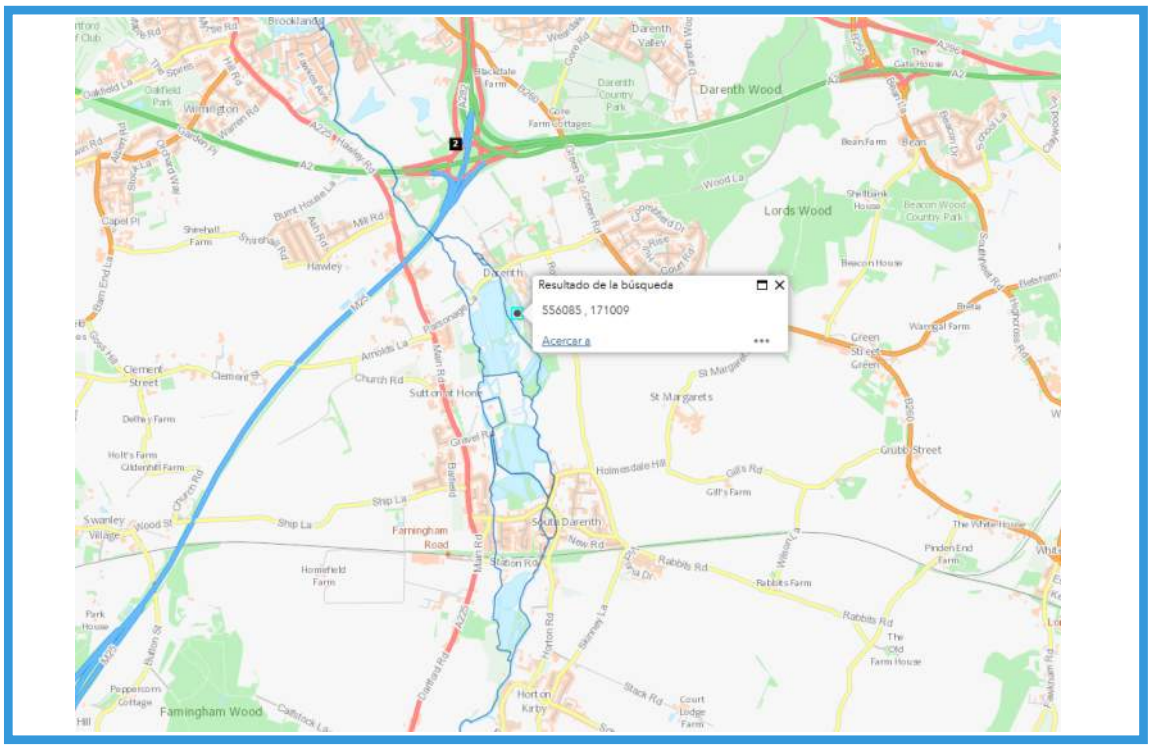


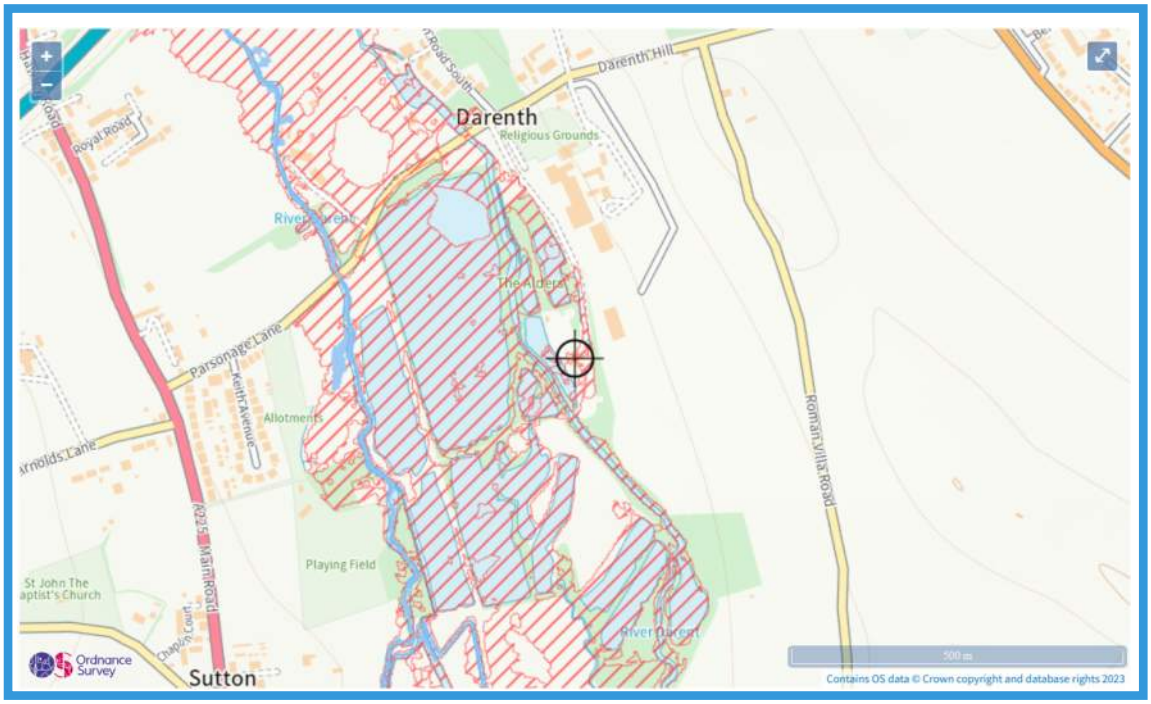
GEOINDEX ONSHORE GEOLOGY - SUPERFICIAL DEPOSITS - TAPLOW GRAVEL MEMBER - SAND AND GRAVEL



SITE HYDROGEOLOGY

Environment Agency Main River Map





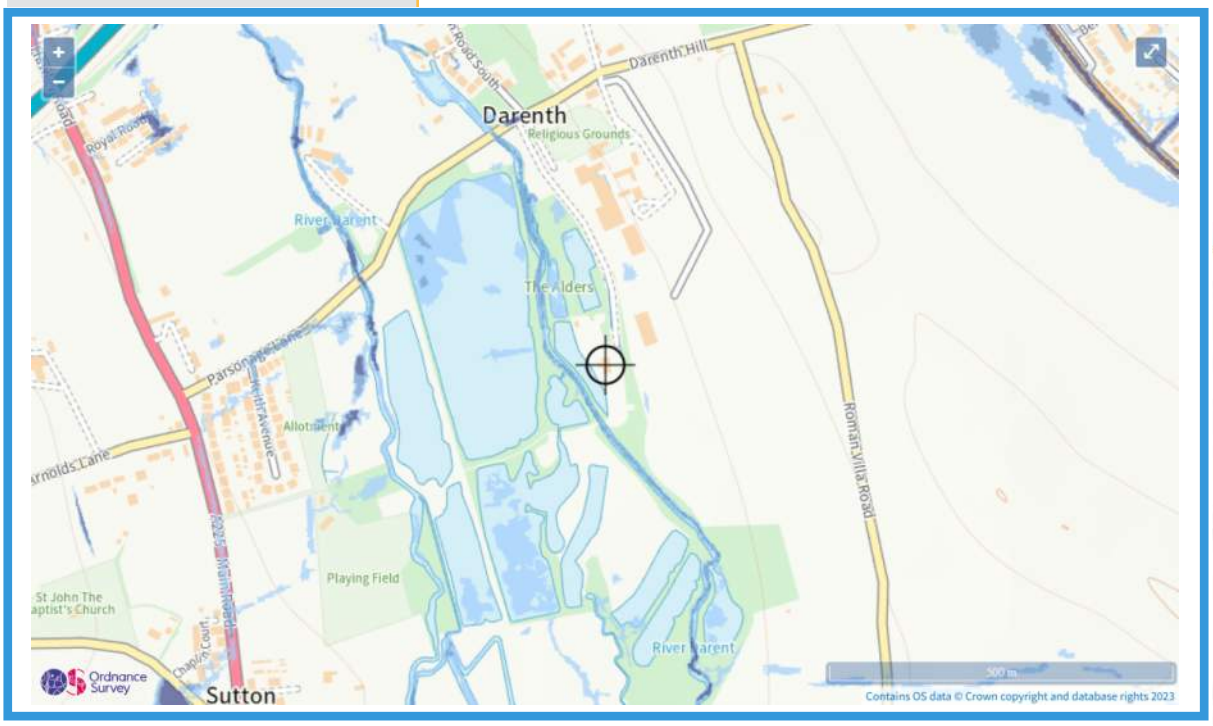
when river levels are normal when there is also flooding from rivers

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



Flood risk

High

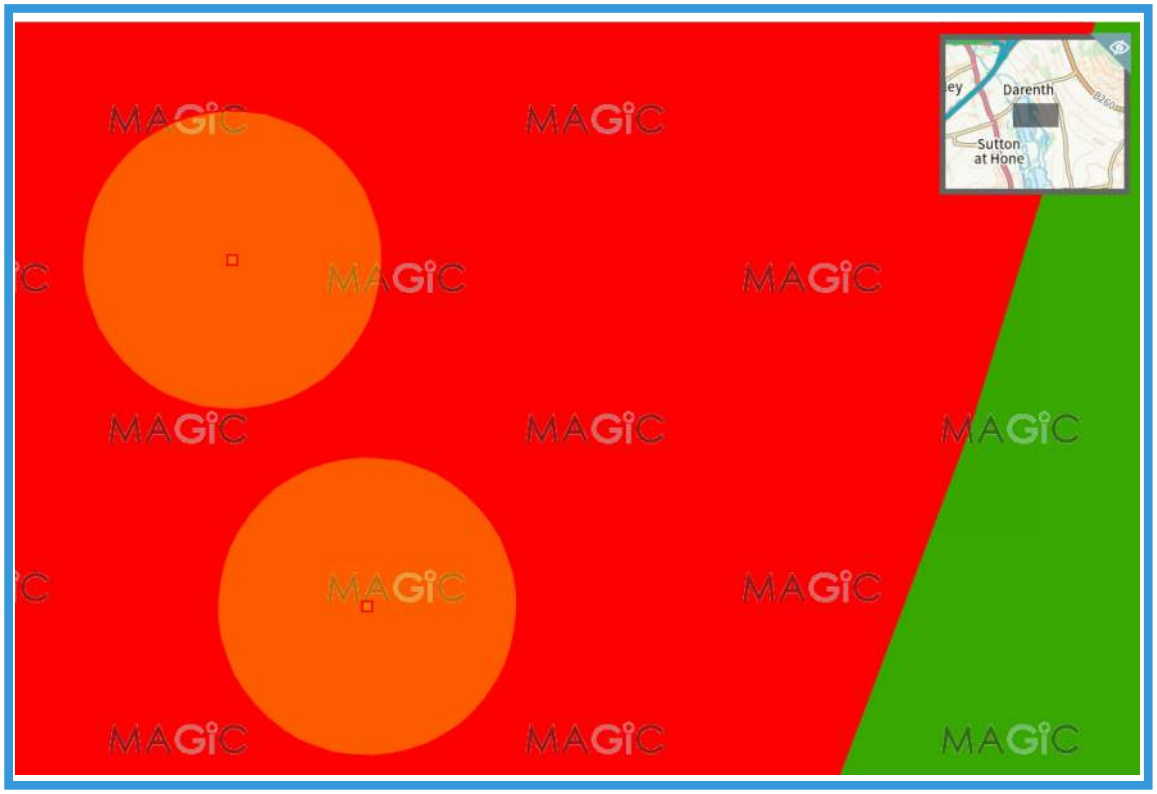
Medium

Low

Very low

Over 900mm 300 to 900mm Below 300mm

MAGIC RESULTS



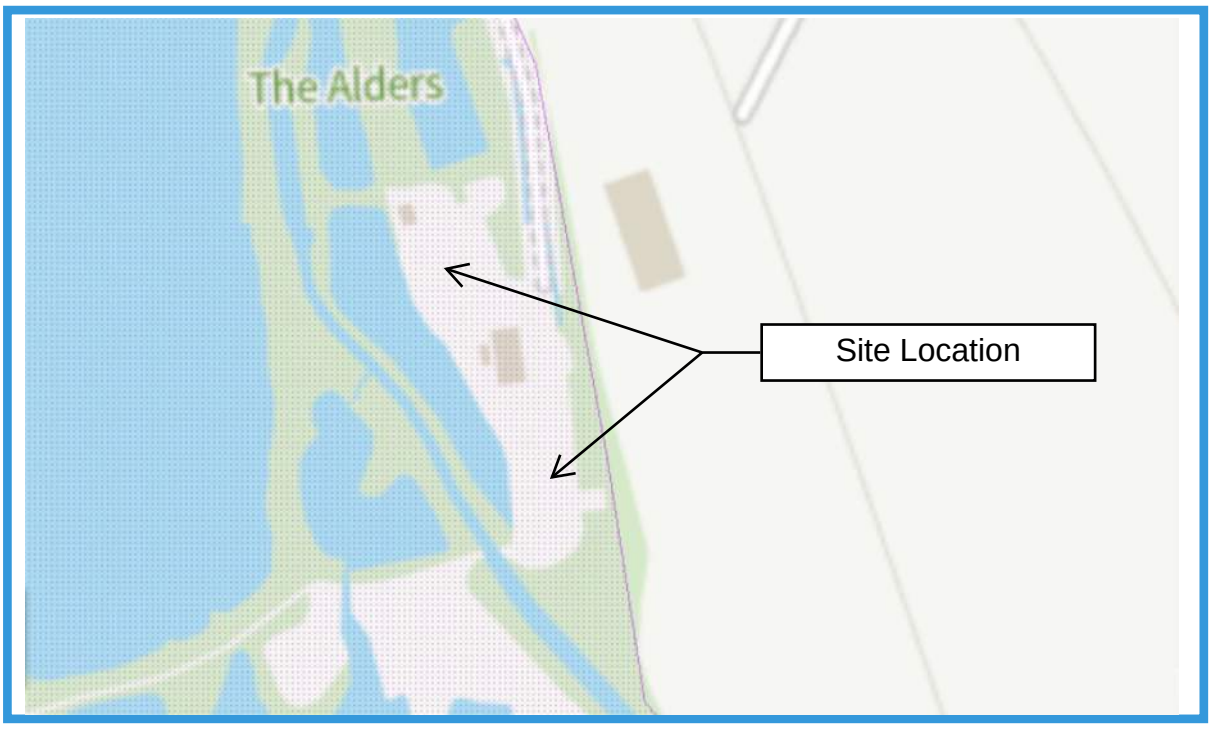
Site Check Results

Site Check Report Report generated on Mon Oct 16 2023
You selected the location: Centroid Grid Ref: TQ56097095
The following features have been found in your search area:

Source Protection Zones merged (England)	
Zone	3
Zone	2
Zone	1
Aquifer Designation Map (Bedrock) (England)	
Typology	Principal
Aquifer Designation Map (Superficial Drift) (England)	
Typology	Secondary A

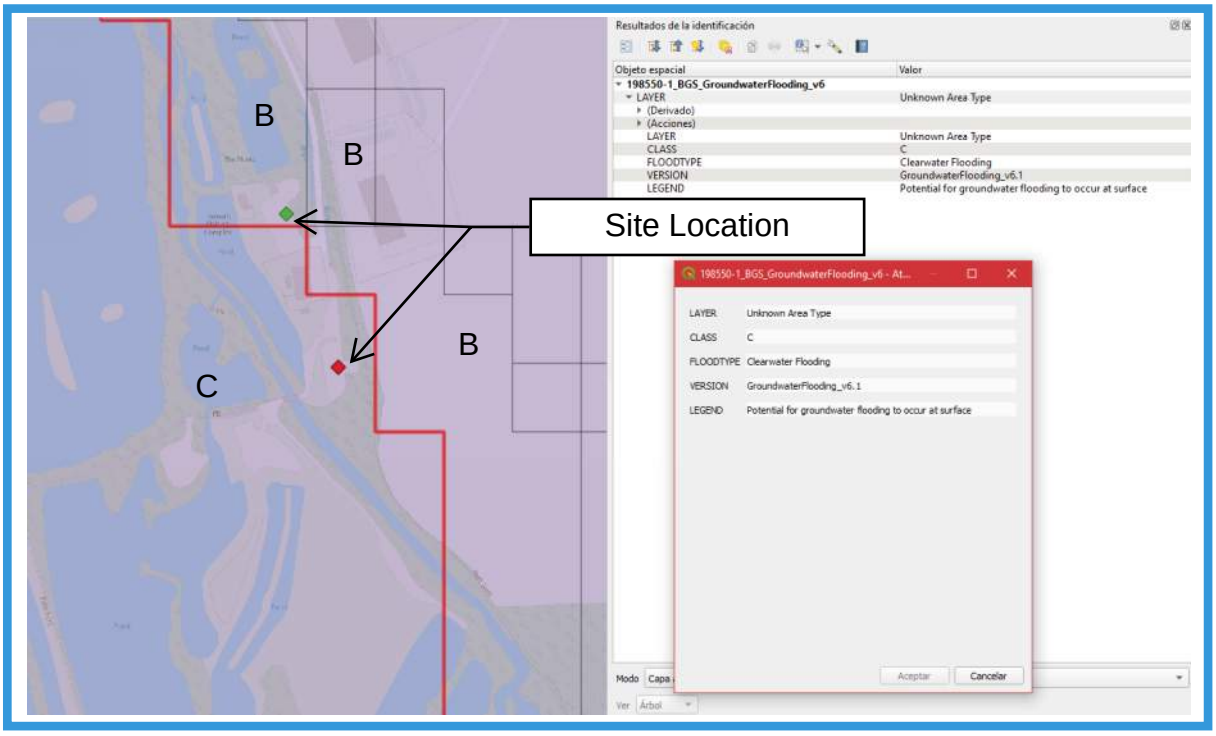
OK Cancel Export to CSV Print

FLOOD WARNING AREA

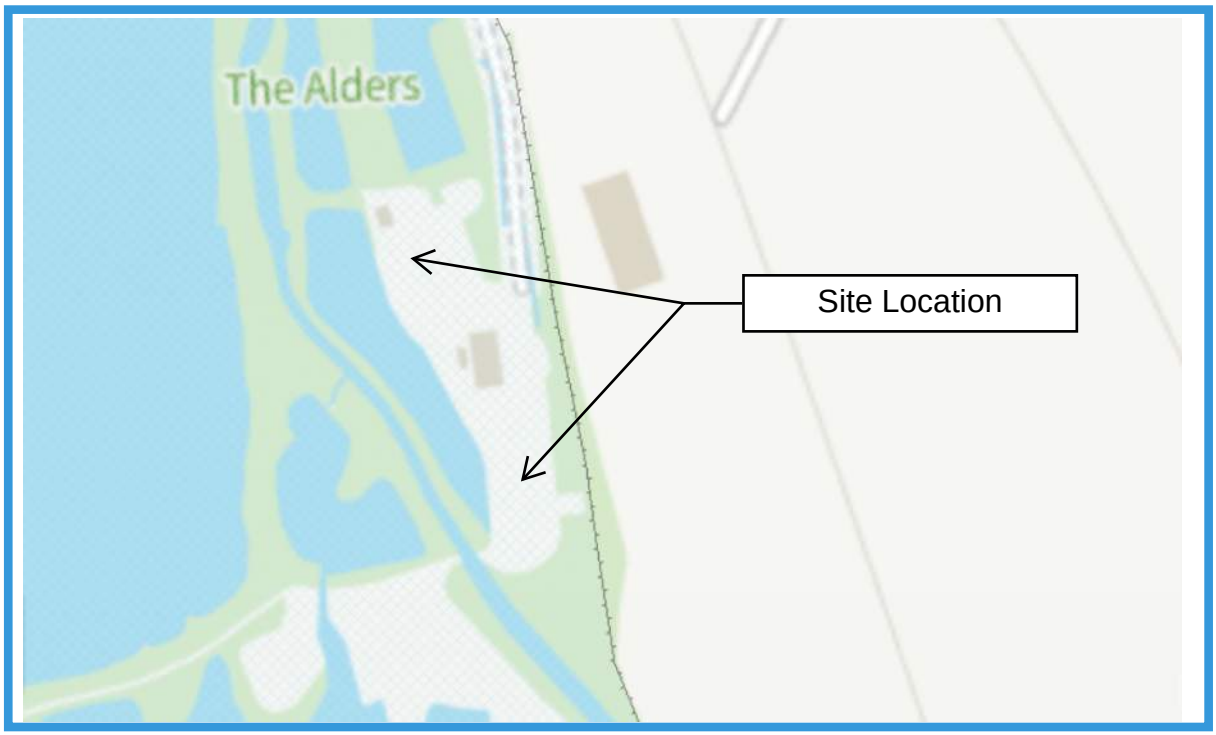


Flood Warning areas

GROUND WATER FLOOD RISK



HISTORIC FLOOD MAP



Historic Flood Outline

Flood map for planning

Your reference	Location (easting/northing)	Created
<Unspecified>	**556101/170955**	**16 Oct 2023 21:38**

Your selected location is in flood zone 3, an area with a high probability of flooding.

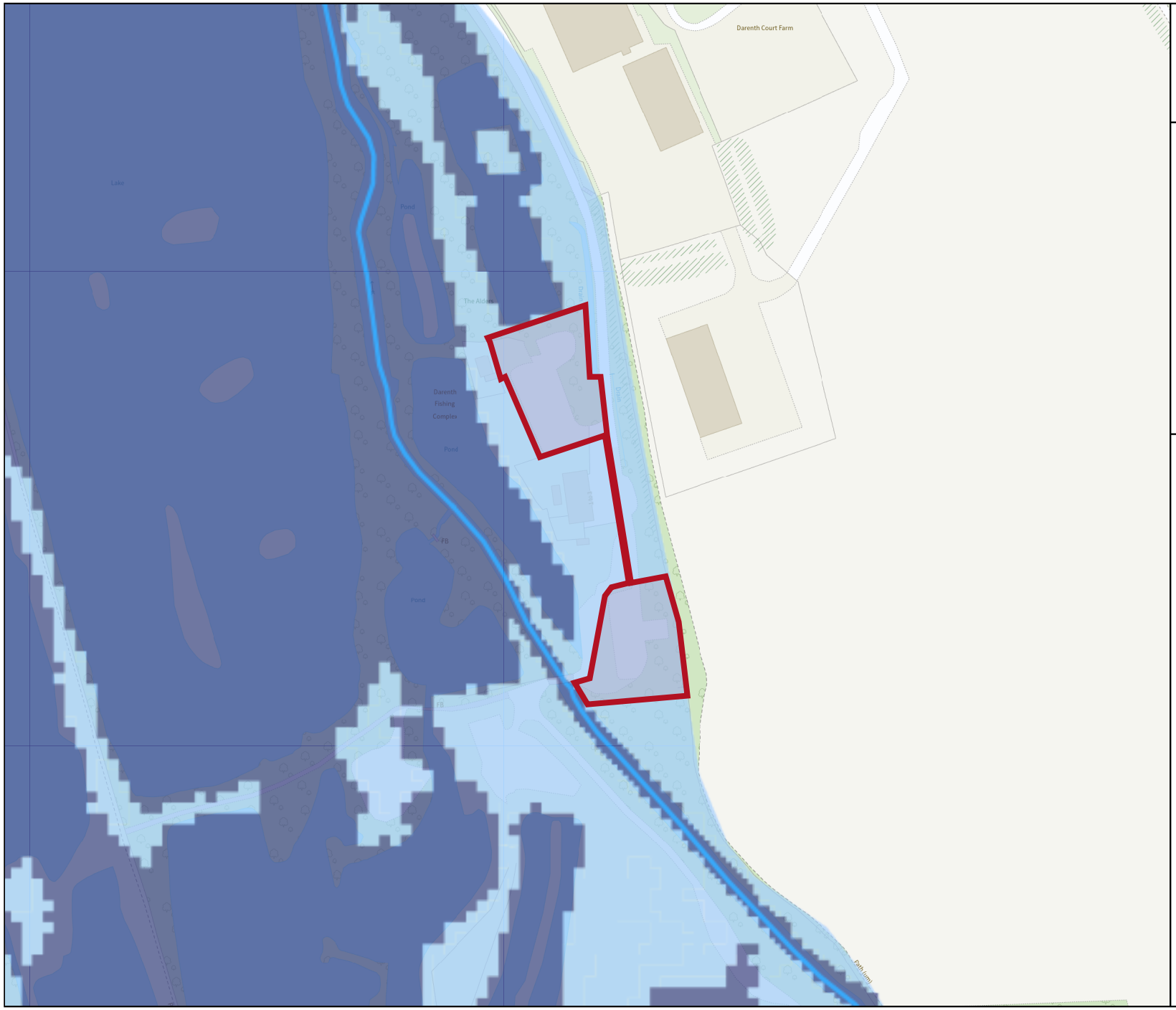
This means:

- you must complete a flood risk assessment for development in this area
- you should follow the Environment Agency's standing advice for carrying out a flood risk assessment (see www.gov.uk/guidance/flood-risk-assessment-standing-advice)

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.



Environment Agency

Flood map for planning

Your reference
<Unspecified>

Location (easting/northing)
556101/170955

Scale
1:2500

Created
16 Oct 2023 21:38

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

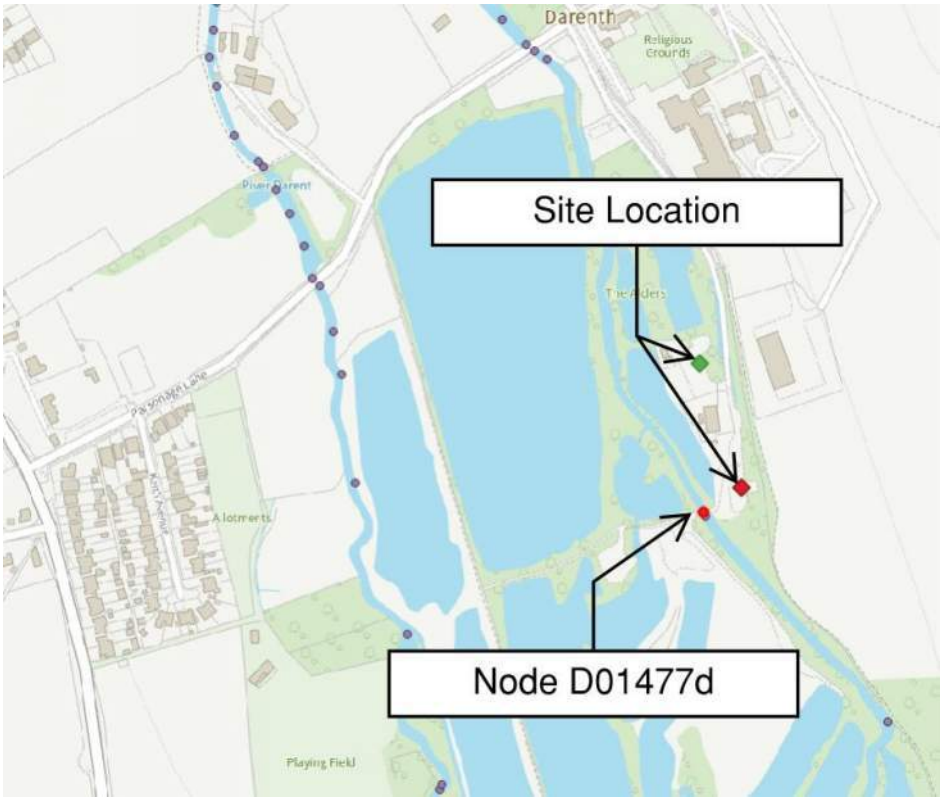
0 20 40 60m

Appendix D

FLOOD LEVELS

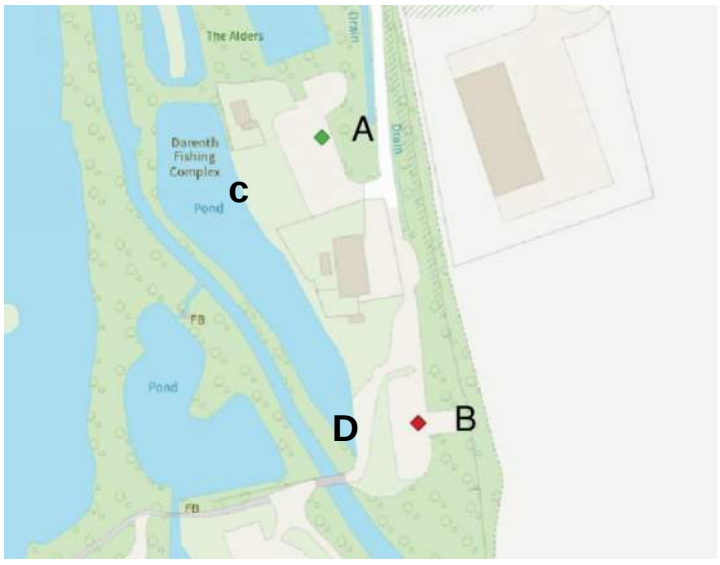
Darent & Cray 2019

1D Model Nodes:



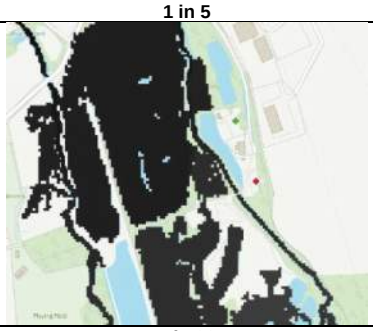
Node	Easting	Northing	Height
D01477d	556088.40	170874.80	14.410

The water levels for the site are as follow

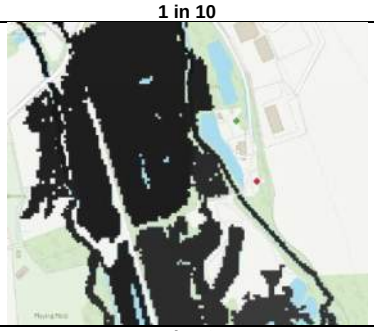


Node	Easting	Northing	1 in 30	1 in 100	1 in 100 +25%	1 in 100 +35%	1 in 100 +70%	1 in 1000
A	556085.00	171009.00	Nil	Nil	Nil	Nil	Nil	Nil
B	556123.00	170897.00	Nil	Nil	Nil	Nil	Nil	Nil
C	556054.10	170994.90	14.908	15.013	15.103	15.143	15.259	15.44
D	556096.60	170897.50	14.908	15.013	15.103	15.143	15.259	15.44

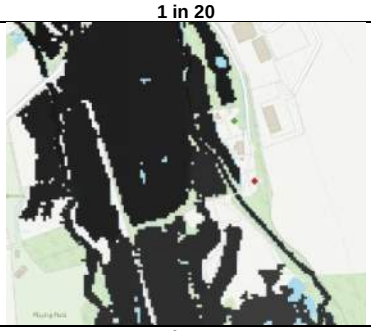
1 in 5



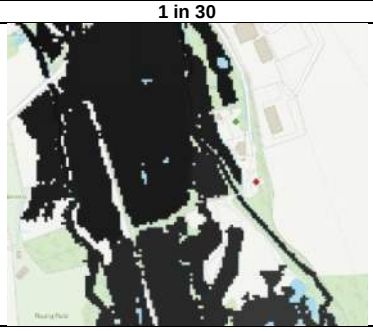
1 in 10



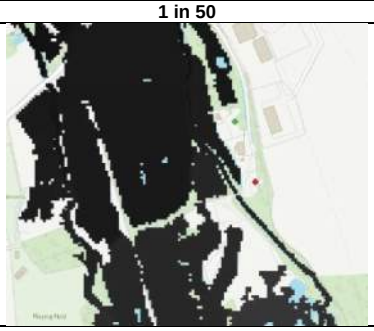
1 in 20



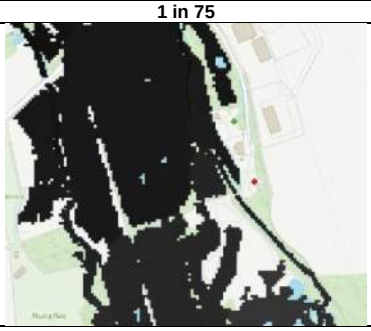
1 in 30



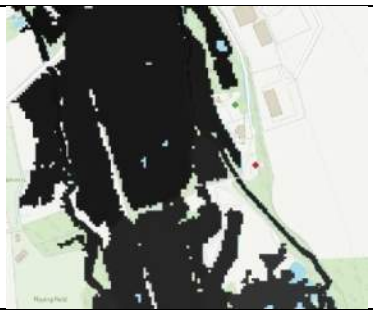
1 in 50



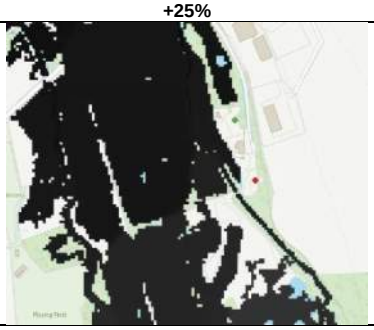
1 in 75



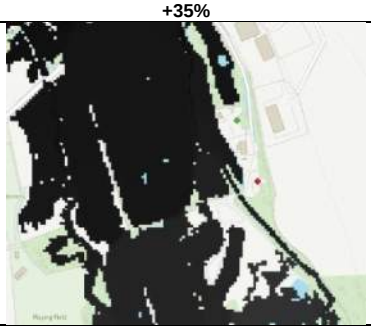
1 in 100



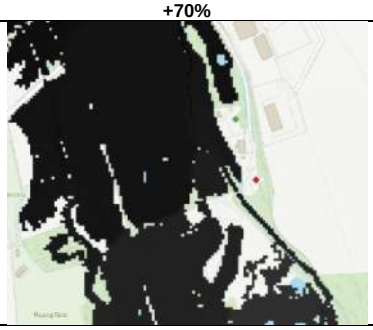
1 in 100 +25%



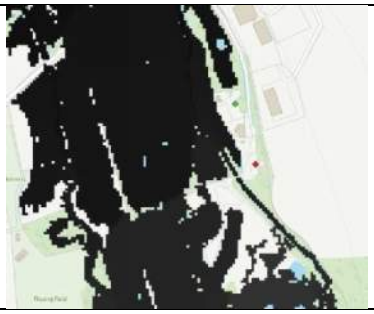
1 in 100 +35%



1 in 100 +70%



1 in 200



1 in 1000