

Haresfield Farms

Land to the East of Existing Caravan Store at Pool Farm, Haresfield, Stonehouse, GL10 3EJ

Flood Risk Assessment and Drainage Strategy

Clive Onions Ltd is complying with Government guidance and continuing to work and support UK business during the Covid-19 crisis and to help enable a speedy return to normal business, when safe to do so. We are working from home and will not visit site, but we are using video conferencing etc to keep in touch and share information.

16th February 2021 V2

This report is based on the instructions given by our client. It is not intended for use by a third party, and no responsibility will be given to any third party.

The consultant has followed accepted procedure in providing the services, but given the residual risk associated with any prediction and the variability which can be experienced in flood conditions, the consultant takes no liability for and gives no warranty against actual flooding of any property (client's or third party) or the consequences of flooding in relation to the performance of the services.

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Issue history

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1.0 Introduction

1.1.1 Works are proposed at Pool Farm in Haresfield. These works include:

- a) Relocation, reconfiguration and erection of new farm buildings to include the creation of a new farm office, grain stores, agricultural deadstock building and workshop. Alterations to existing vehicular access road and forecourt, the installation of a weighbridge and associated drainage and landscaping.
- b) Extension of existing outside storage of unoccupied caravans and motor homes including partial removal of existing landscape bund, the construction of hard-standing and associated drainage and landscaping.

1.1.2 This report describes the works in relation to the caravan store only. A separate report is submitted for the relocation of the farm buildings and access road.

1.1.3 The Environment Agency's (EA) Flood Map for Planning shows the site to be in Flood Zone 1 at low risk of flooding. The EA Surface Water Flooding Map also shows the site to be at very low risk, but the access is shown to experience some surface water flooding, so this risk has been assessed.

1.1.4 This report considers the flood risk impact on the buildings and shows that they will be safe for their 60 year lifetime and do not increase flood risk off site. A sustainable drainage strategy has been described, which meets the highest target in the SuDS hierarchy, relevant for the site.

2.0 Site Location and Setting

2.1.1 The site is located south of Quedgeley at Pool Farm, Haresfield, Stonehouse, Gloucester GL10 3EJ.

2.1.2 The image below shows the area within the farm area which is of interest as the setting for the proposed open air caravan store.

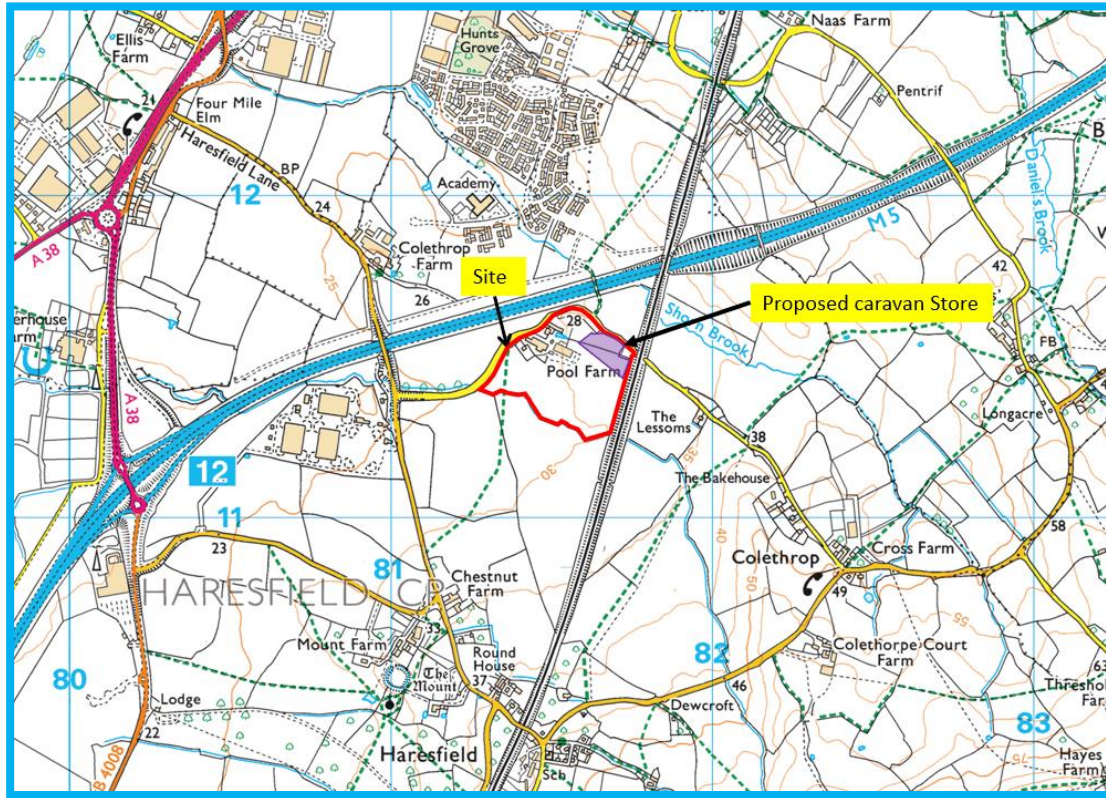


Fig 1 Site location with caravan store within wider farm area (Streetmap)

2.1.3 The site is located in the following setting:

- Immediately north of the site is Colethrop Lane, beyond which is a field and the M5. Ditches run along both sides of Colethrop Lane, starting just west of the Pool Farm buildings. Northeast of the site is Shorn Brook.
- The eastern edge of the site is bound by the railway line, beyond which is farmland. A watercourse runs along the southern half of the eastern boundary. This continues along the southern boundary of the site leading westwards.
- The watercourse flows east to west along the southern boundary of the site into the ditch along Colethrop Lane to the west of the site and then under the M5 in the vicinity of Junction 12. The predominant land use south and west of the site is farmland.

2.1.4 The site can therefore be described as being situated in a rural area on land falling to the west.



Fig 2 Satellite view of site and surrounding area (Google Earth).

3.0 Existing Development and Ground Conditions

- 3.1.1 The farm area of search is irregular in shape and is approximately 400m north-south and 410m east-west with a total approximate area of 11.23ha. The caravan store is in the northeast of the site.
- 3.1.2 The land is shown to have a generally uniform fall of about 1 in 90 from northeast to southwest according to the Ordnance Survey map and Google maps.
- 3.1.3 In the northwest of the site are existing farm buildings used for storage and an office for managing the farm. The northern area of the farm, and south of an area of woodland, is used for caravan storage (which post-dates the Google image).



Fig 3 Satellite view of farm site (Google Earth).

- 3.1.4 The land generally drains into the watercourse south of the site. The buildings and hardstanding area drain into a 300mm diameter underground pipe which flows unattenuated into the watercourse. The existing caravan store drains into a pond north of the buildings which discharges into a roadside pipe and along Colethrop Lane via roadside pipes and open roadside ditches, which has been diverted through the site into the watercourse south of the site.
- 3.1.5 The watercourse size has been given as approximately 1.5m deep, 1m wide at the base and 2m wide at the top of the bank.
- 3.1.6 The watercourse dimensions have been given as generally 1.5m deep, 1m wide at the base and 2m wide at the top of the bank.

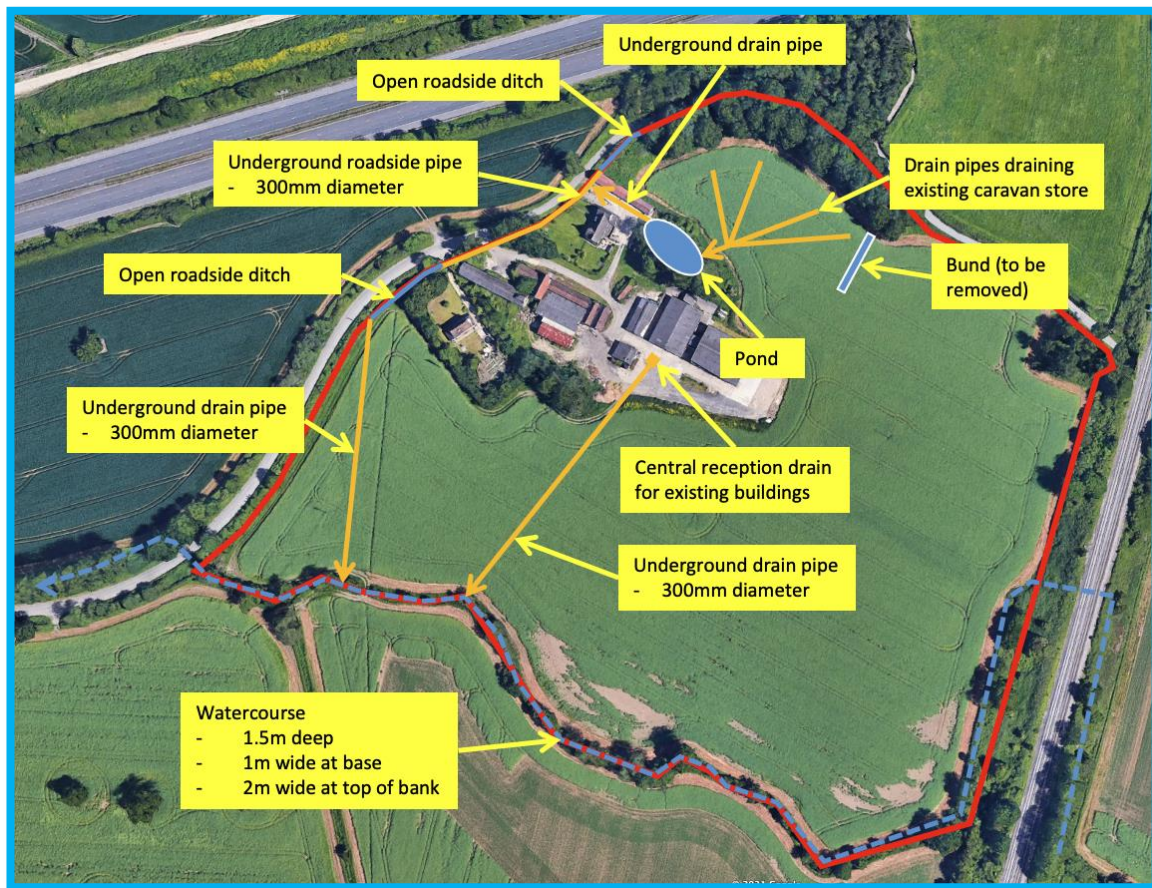


Fig 4 Existing farm area drainage annotated on Google Earth satellite image.

3.1.7 The British Geology Survey shows the geology to be mudstone bedrock. The Cranfield Soilscape Viewer shows the soils to be clayey and some loamy with slightly impeded drainage. The land is low lying, drained by frequent ditches and not suitable for conventional soakways, but appropriate for managing rainfall from permeable surfaces, replicating the natural characteristics.

4.0 Proposed Development

4.1.1 The work involves the extension of existing outside storage of unoccupied caravans and motor homes including partial removal of existing landscape bund, the construction of permeable hard-standing and associated drainage and landscaping is proposed to extend the open caravan store to provide further caravan storage spaces to the northeast of Pool Farm.

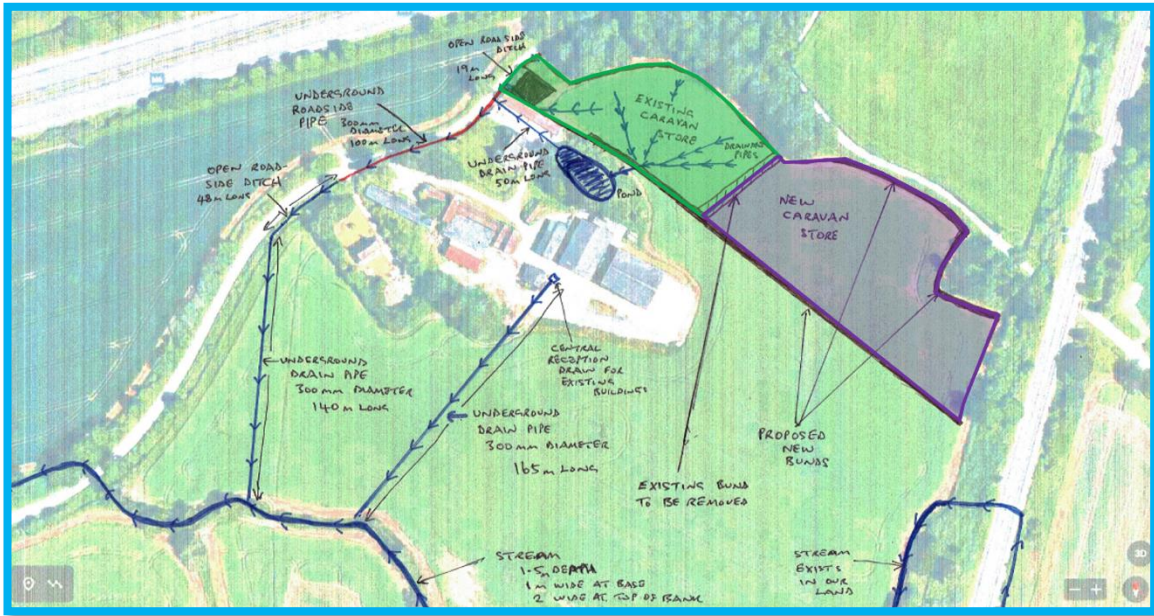


Fig 5 Proposed site plan showing new caravan store in northeast of farm site in context of existing infrastructure.

5.0 Flood Risk

5.1 Fluvial/Tidal Flooding

5.1.1 The EA Flood Map for Planning shows the site to be in Flood Zone 1 at low risk of flooding (land having less than 0.1% annual exceedance probability of river or sea flooding).

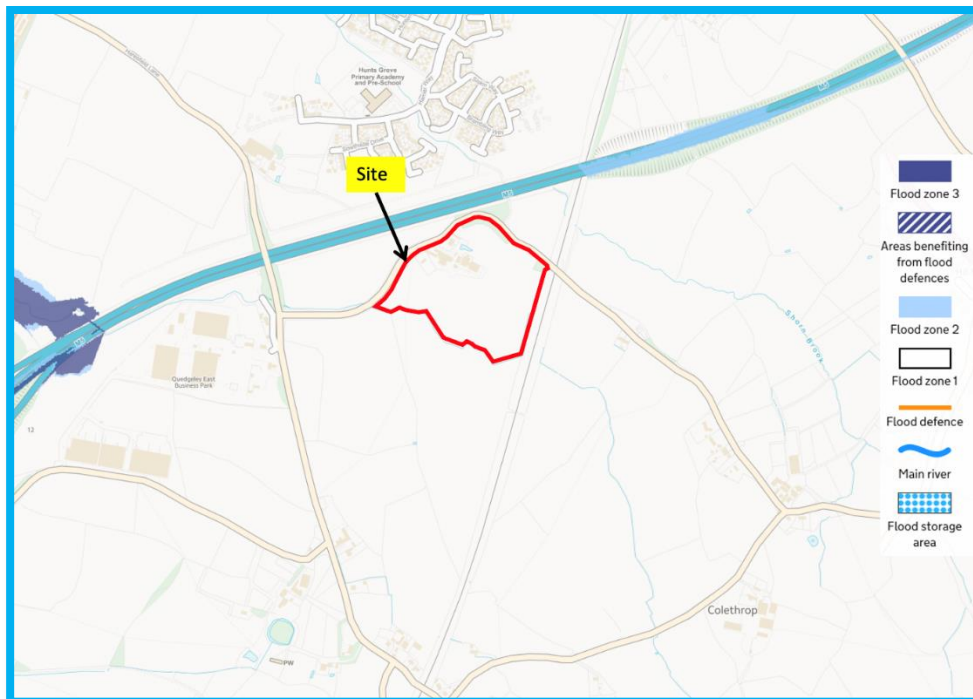


Fig 6 EA Flood Map for Planning showing site in Flood Zone 1, at low risk of flooding.

5.1.2 All development is considered appropriate in Flood Zone 1.

5.2 Surface Water Flooding

5.2.1 The EA Surface Water Flooding Map shows the majority of the farm site to be at very low risk of flooding with a small area along the eastern boundary at low risk of shallow flooding and the southern area along the watercourse to be at low to high risk of surface water flooding. The area of proposed development is at very low risk.

5.2.2 The eastern part of the caravan store site is shown to be at low risk of shallow flooding less than 300mm deep.

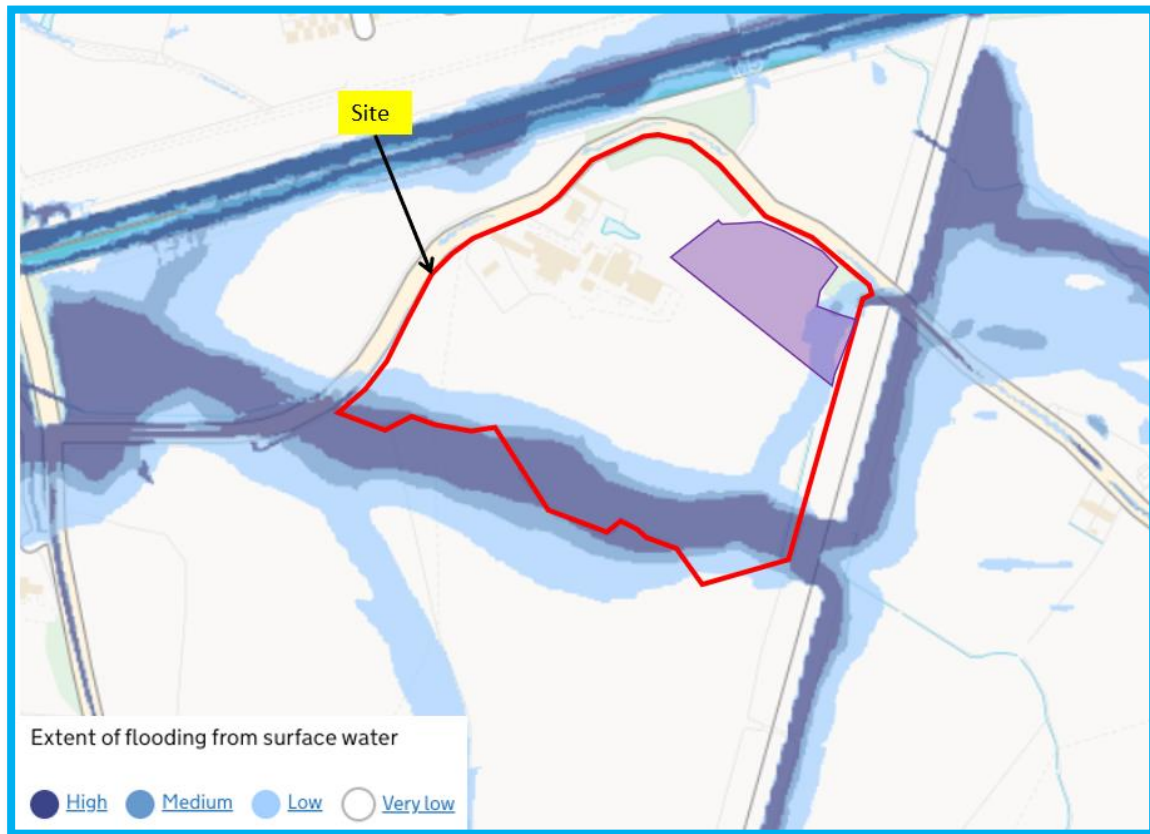


Fig 7 EA Surface Water Flooding Map showing eastern part of caravan store at low risk of shallow flooding (ie less than 300mm deep according to the low risk scenario flood map).

5.2.3 The Medium Risk Scenario (1 in 100 year event) shows a localised ponded area predicted to be less than 300mm deep, but this is not evidence in the farmland. This area will be inspected on site and the level adjusted as necessary with the permeable material.



Fig 8 EA Surface Water Flooding Map – Medium Risk Scenario (1 in 100 year event).

5.3 Other Sources of Flooding

5.3.1 The EA Reservoir Flooding Map shows the site to not be at risk of flooding from reservoirs.



Fig 9 EA Reservoir Flooding Map.

5.3.2 No other sources of flood risk have been identified.

6.0 Policy

- 6.1.1 Flood Policy relates to the protection of people and property. The National Planning Policy Framework (NPPF) and its Planning Practice Guidance (PPG) give guidance on flood risk and steer development away from areas at risk of flooding.
- 6.1.2 The site is in EA Flood Zone 1 according to the EA Flood Map for Planning. All development is considered appropriate in Flood Zone 1.
- 6.1.3 The east of the site is shown to experience shallow surface water flooding in the low risk scenario, but to be free from flooding in the medium risk scenario. A localised pond shown on the flood risk map but not evident on site will be investigated.
- 6.1.4 The proposal is therefore appropriate for less vulnerable development, especially caravans raised above the ground, and the proposal therefore complies with the guidance in the NPPF.

7.0 Surface Water Drainage

- 7.1.1 The existing farm area drainage system will be retained and the caravan store does not affect the current system.
- 7.1.2 The area of the proposed caravan store is currently part of a field which drains by infiltration, and in exceedance events the ground would become saturated and flow south westwards across the field into the watercourse.
- 7.1.3 The soil in the area of the proposed caravan store will be stripped and used to cover the proposed bund or deposited elsewhere in the farm area. The area will then be surfaced with 300mm permeable material.
- 7.1.4 This strategy will provide attenuation storage for rainfall and encourage infiltration and evapotranspiration. The area will contain more rainfall and saturation and overflow across the field will be less frequent and will discharge less volume and at a lower rate. This strategy therefore delivers significant betterment.
- 7.1.5 As a precautionary measure, it is proposed to provide a french drain along the south site of the store, with a catchpit and drain discharging to the existing drain south of the farm buildings which leads to the watercourse, mimicking the natural characteristics.

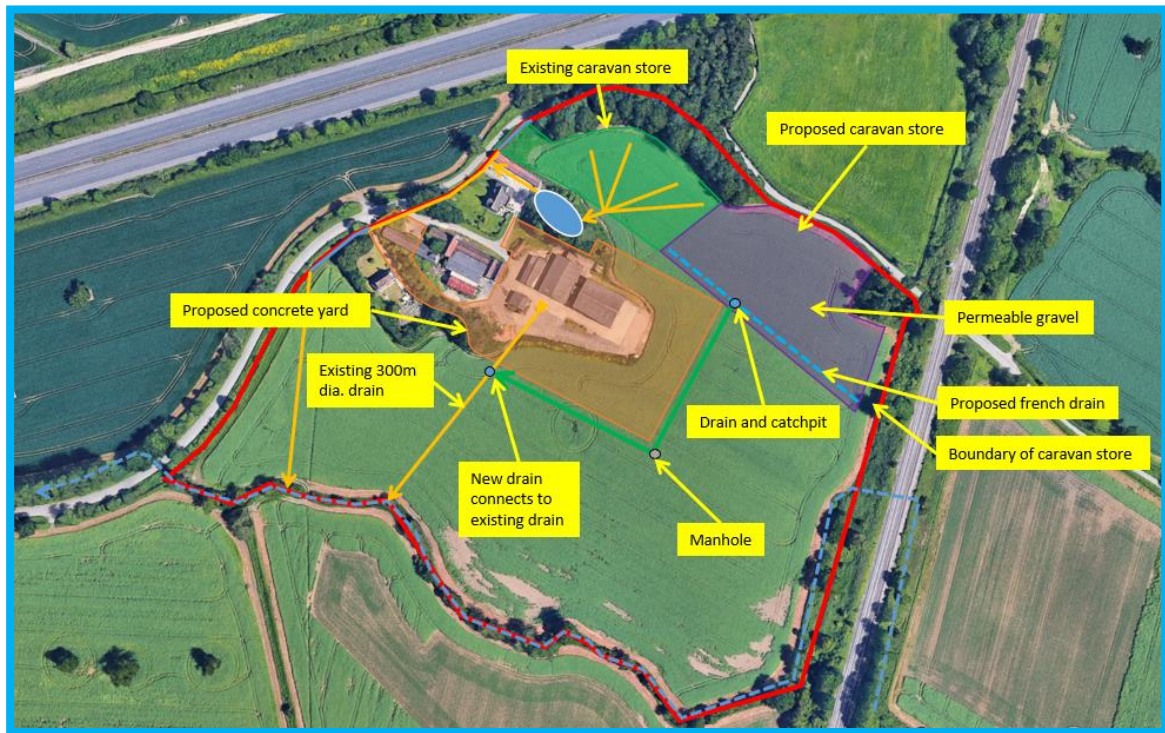


Fig 10 Proposed drainage in the context of the railway and wider site drainage.

7.1.6 A manhole will be installed at the change of direction and on the existing pipe at the connection point to allow for inspection and for clearing debris.

8.0 Safe Escape

8.1.1 Site access and egress is not inhibited by fluvial or tidal flooding.

8.1.2 Colethrop Lane east of the site is shown to experience a short area of shallow flooding, less than 300mm deep, in the Medium Risk Scenario, adjacent the railway. This provides a safe route to and from the site during times of local heavy rainfall.

8.1.3 It is unlikely that caravans will be delivered or collected from storage if heavy storms are forecast.

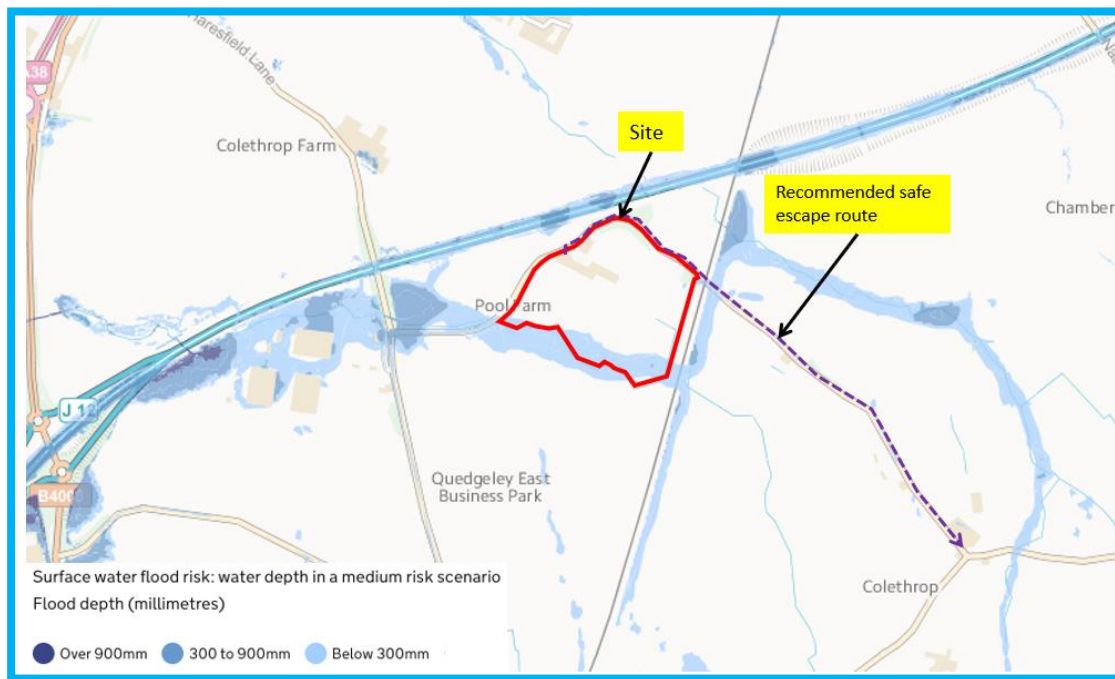


Fig 11 Safe escape annotated on EA Surface Water Flooding Map – Medium Risk Scenario (1 in 100 year event).

9.0 Management and Maintenance

- 9.1.1 The farm Estate Manger will be responsible for the maintenance of the drainage and other common areas of the proposed development.
- 9.1.2 The preamble construction will require little maintenance, comprising mainly of weed control.
- 9.1.3 If ponding is observed the area should be inspected and the cause rectified to avoid nuisance.
- 9.1.4 The catchpit and drain leading off site should be inspected annually and debris cleared as appropriate.

10.0 Conclusions and Recommendations

- 10.1.1 The works involve the extension of existing outside storage of unoccupied caravans and motor homes including partial removal of existing landscape bund, the construction of permeable hard-standing and associated drainage and landscaping on land to the northeast of Pool Farm.
- 10.1.2 The site is shown to be in Flood Zone 1 according to the EA Flood Map for Planning. All forms of development are considered appropriate in Flood Zone 1.
- 10.1.3 The EA Surface Water Flooding Map shows the site to mostly be at very low risk of surface water flooding, with shallow pond and shallow streaming in the Low Risk Scenario.

- 10.1.4 The Less Vulnerable use and character of use is acceptable and there is a low risk to users.
- 10.1.5 A sustainable drainage strategy is proposed to manage runoff from the site relying on natural infiltration through a permeable surface, replicating the natural characteristics. A filter drain with connection to an existing drainage system is proposed as a precautionary measure.
- 10.1.6 Safe access is available.
- 10.1.7 The proposed development will therefore meet the guidance in the NPPF and PPG.