

Flood Risk Assessment (incorporating Drainage Strategy)

Proposal: Outline Planning Application for up to 37 Dwellings at land adjacent to former Poultry Farm, Glenn Garry Farm, Fen Road, Ruskington, NG34 9TH

For: Stonegate Farmers Ltd

Written by: RARW / EC Checked by: RW

ISSUE DATE: 13/12/2023

1.0 Introduction:

This application is being made in support of an outline planning application for 37 Affordable Homes at the former Glen Garry Farm in Ruskington. The application also the creation of a pond which presents the combined benefits of stormwater attenuation and habitat creation.

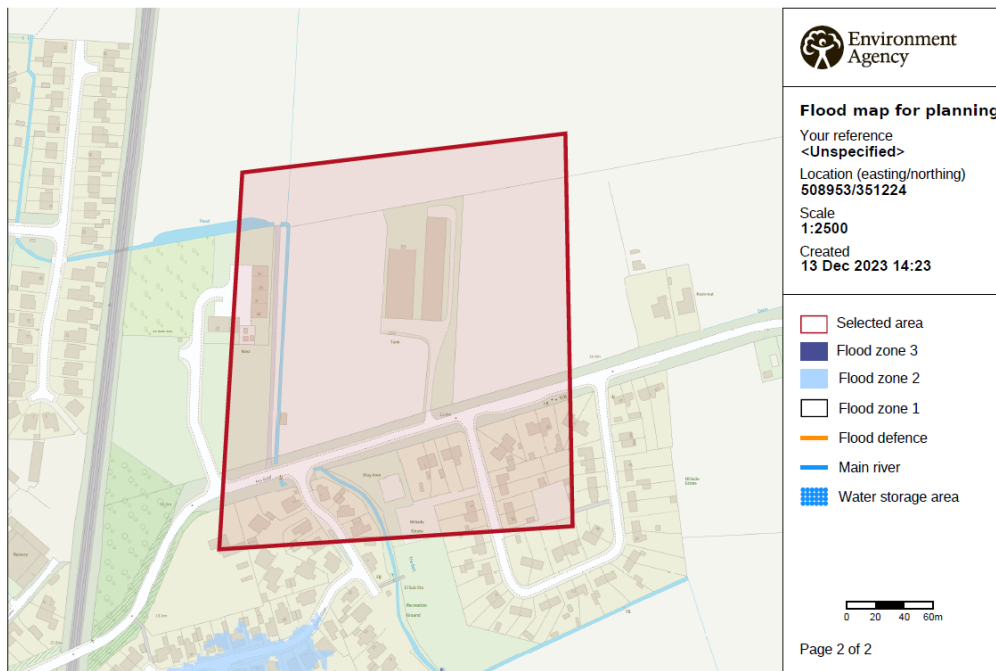
The site is part of a former Poultry Farm, and is 14687m sq.

2.0 Site Location:

Ruskington is located 5km north of Sleaford in Lincolnshire. The site is located on the North East edge of Ruskington, 300m along Fen Road to the east of the railway bridge. The site entrance is located virtually opposite the western entrance to the Hillside Estate.

3.0 Flood Zone Status:

The application site is in Flood Zone 1. The Flood Map for Planning is as follows:



Source: <https://flood-map-for-planning.service.gov.uk/location>

The full report from 'Flood Map for Planning' is included as Appendix A to this document.

4.0 Flood Zone 1:

This application requires a Flood Risk Assessment as the application area is over 1 hectare.

The FRA concludes that the site lies within Flood Zone 1, with a 'Very Low' Risk of Flooding, which has a chance of less than a 1,000 year (0.1%) AEP of fluvial or tidal flooding.

The EA Flood Guidance categorises 'Land and buildings used for Agriculture and Forestry' as being 'Less Vulnerable' (source: <https://www.gov.uk/guidance/national-planning-policy-framework/annex-3-flood-risk-vulnerability-classification>)

Table 1: Flood zones

(Note: These flood zones refer to the probability of river and sea flooding, ignoring the presence of defences)

Zone 1 - low probability

Definition

This zone comprises land assessed as having a less than 1 in 1,000 annual probability of river or sea flooding (<0.1%).

Appropriate uses

All uses of land are appropriate in this zone.

Flood risk assessment requirements

For development proposals on sites comprising one hectare or above the vulnerability to flooding from other sources as well as from river and sea flooding, and the potential to increase flood risk elsewhere through the addition of hard surfaces and the effect of the new development on surface water run-off, should be incorporated in a flood risk assessment. This need only be brief unless the factors above or other local considerations require particular attention.

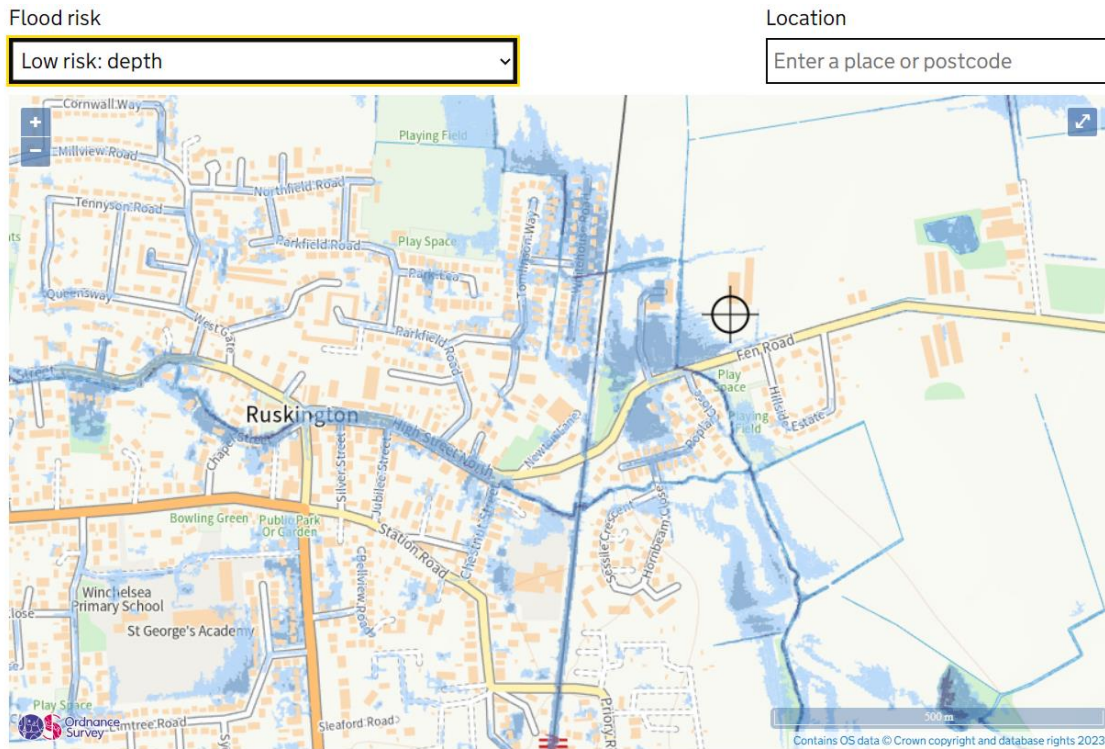
Policy aims

In this zone, developers and local authorities should seek opportunities to reduce the overall level of flood risk in the area and beyond through the layout and form of the development, and the appropriate application of sustainable drainage systems².

Surface water from the yard and water from the roof of the new buildings is directed to an attenuation pond for release via 2.8 litre per second hydro-brake into an existing watercourse located in the site.

5.0 Surface Water Flooding Risk:

The EA Surface Water Flood Map is as follows:



Surface water flood risk: water depth in a low risk scenario

(Source: <https://check-long-term-flood-risk.service.gov.uk>)

The location of the building and the yard is an area shown as being low risk of surface water flooding.

However, the scheme involves extensive drainage to capture, store and attenuate storm water, which will reduce flood risk downstream.

An indicative drainage sketch and calculations for the minimum size of the Surface Water Attenuation Pond have been prepared by Graham Schofield Associates (GSA) and are included as 'Appendix B' this document.

6.0 Existing Watercourse:

There is a watercourse which runs to the west boundary of the site.

The watercourse is shown on the EA Rivers Map (NB the Watercourse which flows next to the site is not categorised as a Main River). It is also worth noting that the proposed pond does not impound the watercourse.



7.0 Summary:

The site lies in an area with a very low Flood Risk (Flood Zone 1) and the building does not sit in an area with risk of Surface Water Flooding.

The EA Flood Guidance categorises residential use as being suitable for this Flood Zone.

The wider site is in an area with poor percolation. A watercourse is located on the site. Existing surface water can be managed, captured and stored to improve the situation.

The proposal includes an attenuation pond. Calculations for the pond have been prepared by Graham Schofield Associates (GSA) and are included in the application.

The proposal creates an attenuation pond which will collect water from the buildings and release the water via a smaller outlet (150mm dia pipe) which has a 2.8 litre per second hydro-brake restrictor. This will reduce and represents an improvement on run-off rates into the watercourse, reducing the risk of flooding downstream.

8.0 Conclusion:

- The site lies in Flood Zone 1.
- The building use is suitable for Flood Zone 1.

- The proposed drainage strategy means the buildings and roads can be drained without having an adverse effect on any properties or land downstream. The proposed drainage strategy will be an improvement to the existing storm drainage situation.
- The strategy also slows down the release of water into the watercourse, reducing the risk of flooding off-site.



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APPENDIX A:

FLOOD MAP FOR PLANNING (TEXT ONLY)

(THE FLOOD MAP IS IN SECTION 3 OF THE FRA)



Flood map for planning

Your reference	Location (easting/northing)	Created
<Unspecified>	508953/351224	13 Dec 2023 14:23

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>

The map which accompanied the above text is already included in section 3.0 of this Assessment.



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APPENDIX B:

INDICATIVE SURFACE WATER DRAINAGE SCHEME AND POND STORAGE CALCULATIONS BY GRAHAM SCHOFIELD ASSOCIATES

Flow Control

FOR AN IMPERMEABLE AREA OF 0.82 HA, S.W. DISCHARGE RATE INTO WATERCOURSE TO BE LIMITED TO 2.8 L/s. DEPENDENT UPON WATERCOURSE LEVELS, FLOW CONTROL TO BE PROVIDED BY HYDROBRAKE CHAMBER OR PUMPING CHAMBER.



GSA Engineers Strategy Sketch 18.12.23

15/12/2023, 09:37

Surface water storage volume estimation - members | UK SuDS

Calculated by:

Site name:

Site location:

Site Details

Latitude:

Longitude:

Reference:

Date:

This is an estimation of the storage volume requirements that are needed to meet normal best practice criteria in line with Environment Agency guidance "Rainfall runoff management for developments", SO30219 (2013), the SuDS Manual CT53 (Ciria, 2015) and the non-statutory standards for SuDS (Defra, 2015). It is not to be used for detailed design of drainage systems. It is recommended that hydraulic modelling software is used to calculate volume requirements and design details before finalising the design of the drainage scheme.

Site characteristics

Total site area (ha):

Significant public open space (ha):

Area positively drained (ha):

Impermeable area (ha):

Percentage of drained area that is impermeable (%):

Impervious area drained via infiltration (ha):

Return period for infiltration system design (year):

Impervious area drained to rainwater harvesting (ha):

Return period for rainwater harvesting system (year):

Compliance factor for rainwater harvesting system (%):

Net site area for storage volume design (ha):

Net impermeable area for storage volume design (ha):

Pervious area contribution to runoff (%):

Methodology

esti

Q_{BAR} estimation method:

SPR estimation method:

Soil characteristics

	Default	Edited
SOIL type:	4	4
SPR:	0.47	0.47

Hydrological characteristics

	Default	Edited
Rainfall 100 yrs 6 hrs:	--	63
Rainfall 100 yrs 12 hrs:	--	96.25
FEH / FSR conversion factor:	1.25	1.25
SAAR (mm):	581	581
M5-60 Rainfall Depth (mm):	20	20
r Ratio M5-60/M5-2 day:	0.4	0.4
Hydrological region:	5	5
Growth curve factor 1 year:	0.87	0.87
Growth curve factor 10 year:	1.65	1.65
Growth curve factor 30 year:	2.45	2.45
Growth curve factor 100 years:	3.56	3.56
Q _{BAR} for total site area (l/s):	4.93	4.93
Q _{BAR} for net site area (l/s):	3.18	3.18

* where rainwater harvesting or infiltration has been used for managing surface water runoff such that the effective impermeable area is less than 50% of the 'area positively drained', the 'net site area' and the estimates of Q_{BAR} and other flow rates will have been reduced accordingly.

Design criteria

Climate change allowance factor:

Urban creep allowance factor:

Volume control approach:

Interception rainfall depth (mm):

Minimum flow rate (l/s):

15/12/2023, 09:37

Surface water storage volume estimation - members | UK SuDS

Site discharge rates	Estimated storage volumes		Default	Edited
	Default	Edited		
1 in 1 year (l/s):	2.8	2.8	487	487
1 in 30 years (l/s):	7.8	7.8	71	71
1 in 100 year (l/s):	11.3	11.3	558	558

This report was produced using the storage estimation tool developed by HRWallingford and available at www.uksuds.com. The use of this tool is subject to the UK SuDS terms and conditions and licence agreement, which can both be found at <http://uksuds.com/terms-and-conditions.htm>. The outputs from this tool have been used to estimate storage volume requirements. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, CEH, Hydrosolutions or any other organisation for the use of these data in the design or operational characteristics of any drainage scheme.