



Land North and West of Hethersett

**Preliminary Flood Risk Assessment and
Surface Water Drainage Strategy**

November 2018

Executive Summary

This Preliminary Flood Risk Assessment and Drainage Strategy has been prepared on behalf of Pigeon Land 2 Ltd ('Pigeon') and the Hethersett Consortium (the 'Landowners') in support of a high quality mixed-use sustainable scheme on land to the north and west of Hethersett (the 'Site').

The purpose of this Statement is to provide an assessment of the flood risk associated with the Site in order to inform the preparation of a Concept Masterplan.

The Strategy provides an assessment of options for managing surface water runoff from the Site using sustainable drainage methods, demonstrating that runoff from the Site will not give rise to offsite flood risk.

The Site is not in an area of fluvial flood risk (i.e. from rivers) and the whole of the Site is located in Flood Zone 1 (lowest probability of flooding). Consequently the Site meets the requirements of the Sequential Test in directing development towards areas with lowest flood risk and therefore flood risk does not present a constraint.

There are some limited areas of surface water (overland flow) flooding within the Site. However, surface water will be managed through the design process (i.e. provision of swales or other sustainable drainage features) to ensure surface water is appropriately managed and routed through green corridors or other suitable areas. Consequently, surface water flooding is not a constraint.

The Site is not at flood risk from reservoirs or other manmade sources.

Surface water runoff will be managed using SuDS methods with runoff managed as close to source as possible, and in accordance with the Surface Water Drainage Hierarchy (SWDH).

Where conditions are suitable surface water will be discharged by infiltration to the ground. At the next level of the SWDH runoff will be discharged to local watercourses. These watercourses are tributaries of the River Yare located to the north of Hethersett.

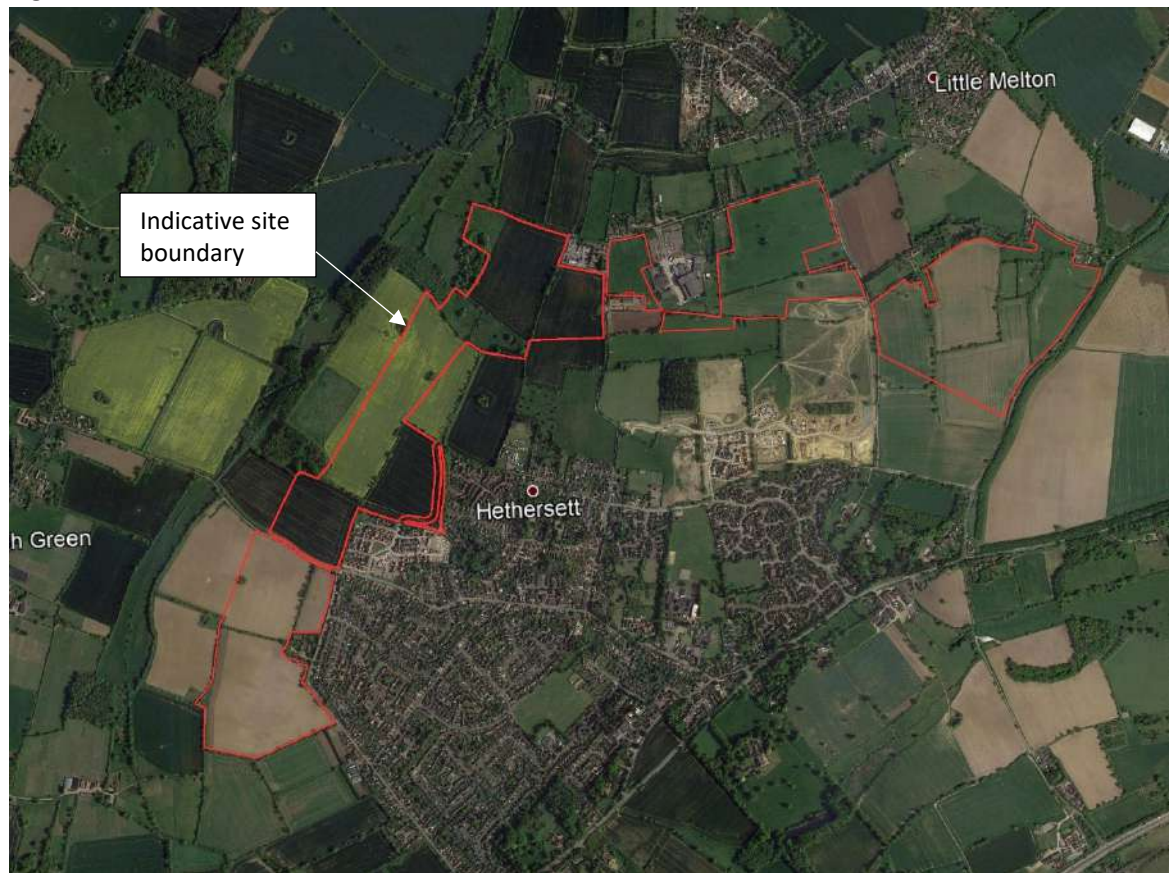
Discharge rates to watercourses will be controlled to the natural (greenfield) runoff rate for the equivalent storm event. Attenuation storage will be provided for up to the 100 year storm event with appropriate allowance for climate change and 'urban creep'.

Exceedance flooding (i.e. surface water runoff in excess of the design storm event) will be routed through the Site to areas of least vulnerability to ensure no flooding of new homes or buildings either on or off the Site.

1 Introduction

- 1.1 This Preliminary Flood Risk Assessment and Drainage Strategy has been prepared on behalf of Pigeon Land 2 Ltd ('Pigeon') and the Hethersett Consortium (the 'Landowners') in respect of land to the North and West of Hethersett (the 'Site')
- 1.2 The purpose of this report is to provide information on the flood risks associated with the Site; and the strategy for managing surface water runoff. Surface water runoff will be managed using a sustainable approach to ensure there are no increased risks of flooding to surrounding areas, and that the Site itself is not at risk of flooding.
- 1.3 The Site location is shown in Fig. 1.1.

Fig. 1.1: Site location

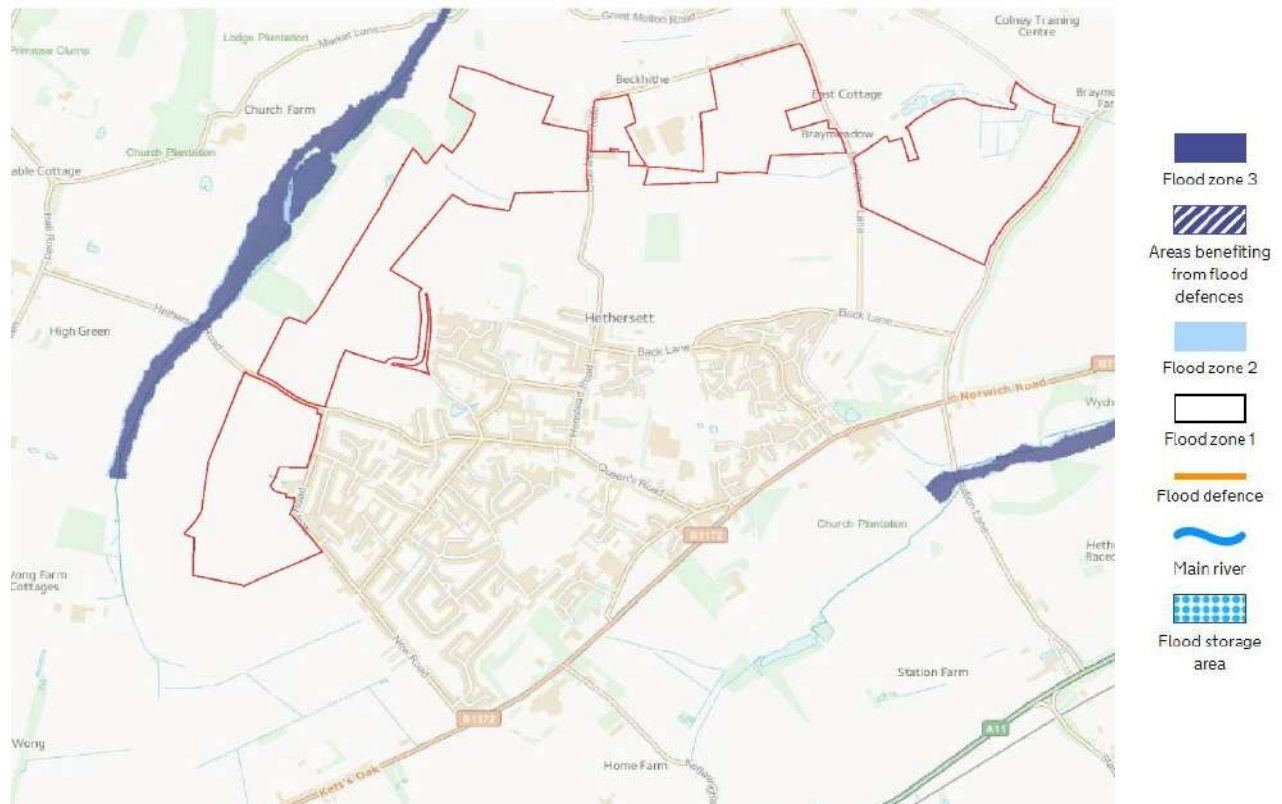


2 Flood Risk Statement

Fluvial Flood Risk

- 2.1 The Site is located within Flood Zone 1 (Low Risk) as shown in Fig. 2.1. Consequently, development meets the requirements of the Sequential Test and is suitable for all forms of development.
- 2.2 The River Tiffey (a tributary of the River Yare to the north) is located to the west of the Site. Flood Zones 2 and 3 associated with this watercourse do not affect the Site.

Fig. 2.1: Flood Risk from Fluvial Sources



Flood Risk from Surface Water

- 2.3 There are minor areas of overland surface water flow within the Site as shown in Fig. 2.2.
- 2.4 It is proposed that these surface water flows will be incorporated within the drainage strategy for the Site through the use of sustainable drainage features, such as swales, thereby ensuring that these flows do not result in flooding.

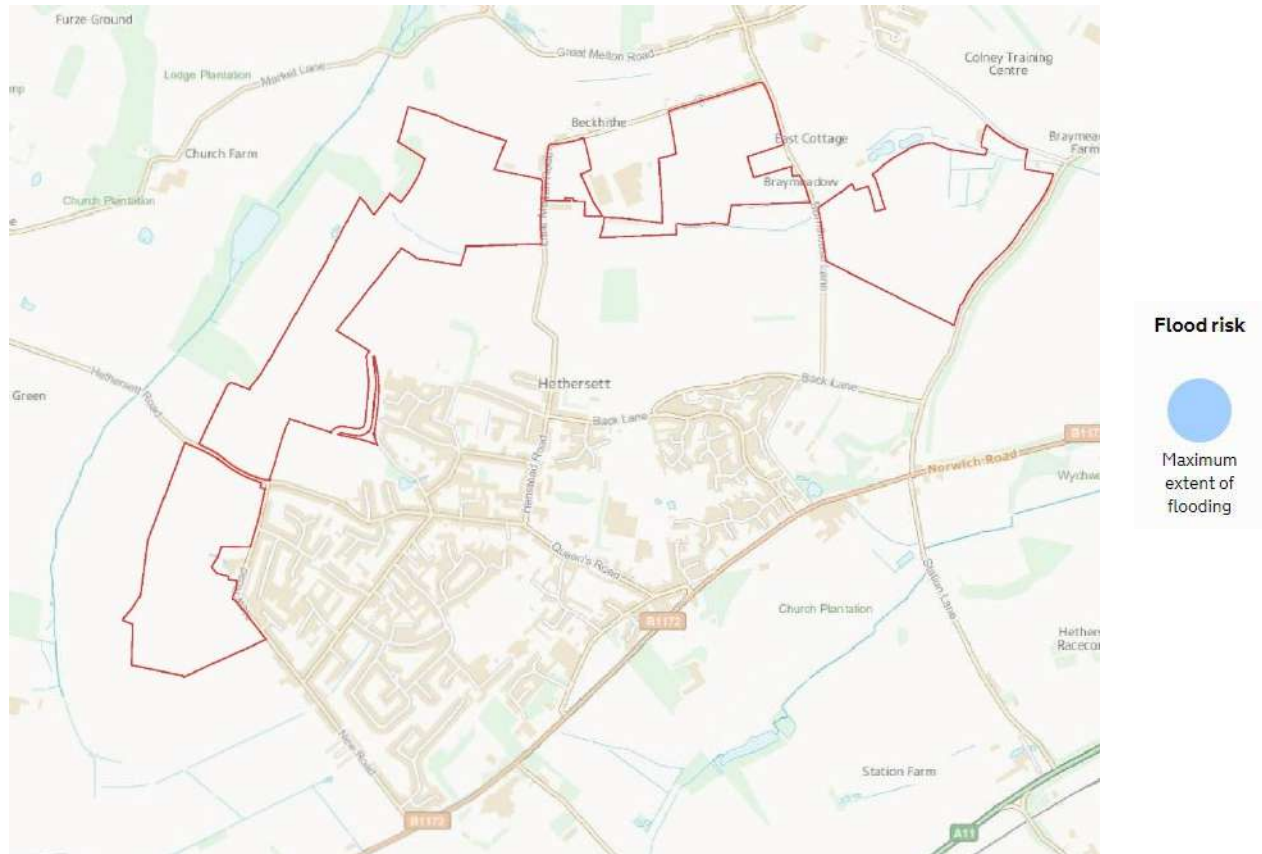
Fig. 2.2: Flood Risk from Surface Water



Flood Risk from Reservoirs

2.5 There are no flood risks from reservoirs and other artificial structures associated with the Site as shown in Fig. 2.3

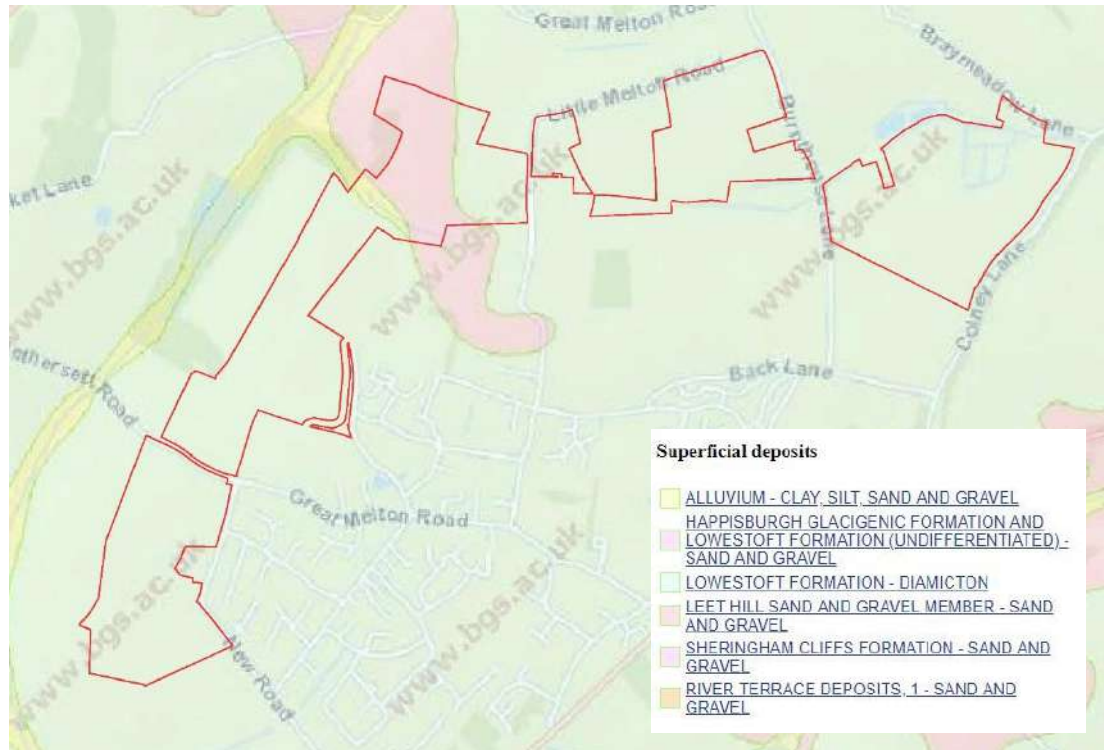
Fig. 2.3: Flood Risk from Reservoirs



3 Surface Water Drainage Strategy

- 3.1 Surface water runoff from the Site will be managed using sustainable drainage (SuDS) methods to ensure that there is no increased flood risk to offsite areas, and that the Site itself is not at risk of flooding.
- 3.2 The surface water drainage strategy will conform to the Surface Water Drainage Hierarchy as described in the SuDS Manual 2015 (C753). The Hierarchy is as follows:
- i. Disposal to the ground
 - ii. Disposal to a watercourse
 - iii. Disposal to a surface water sewer
 - iv. Disposal to a combined sewer
- 3.3 BGS Survey information has been studied to identify the Site's geological properties. The following figures demonstrate the information extracted with the indicative Site boundary identified in red.
- 3.4 Figure 3.1, overleaf, indicates that the Site's superficial deposits are classified as mainly Lowestoft Formation (Diamicton) with an area of Sheringham Cliffs Formations (Sand and Gravel) to the north-west corner.

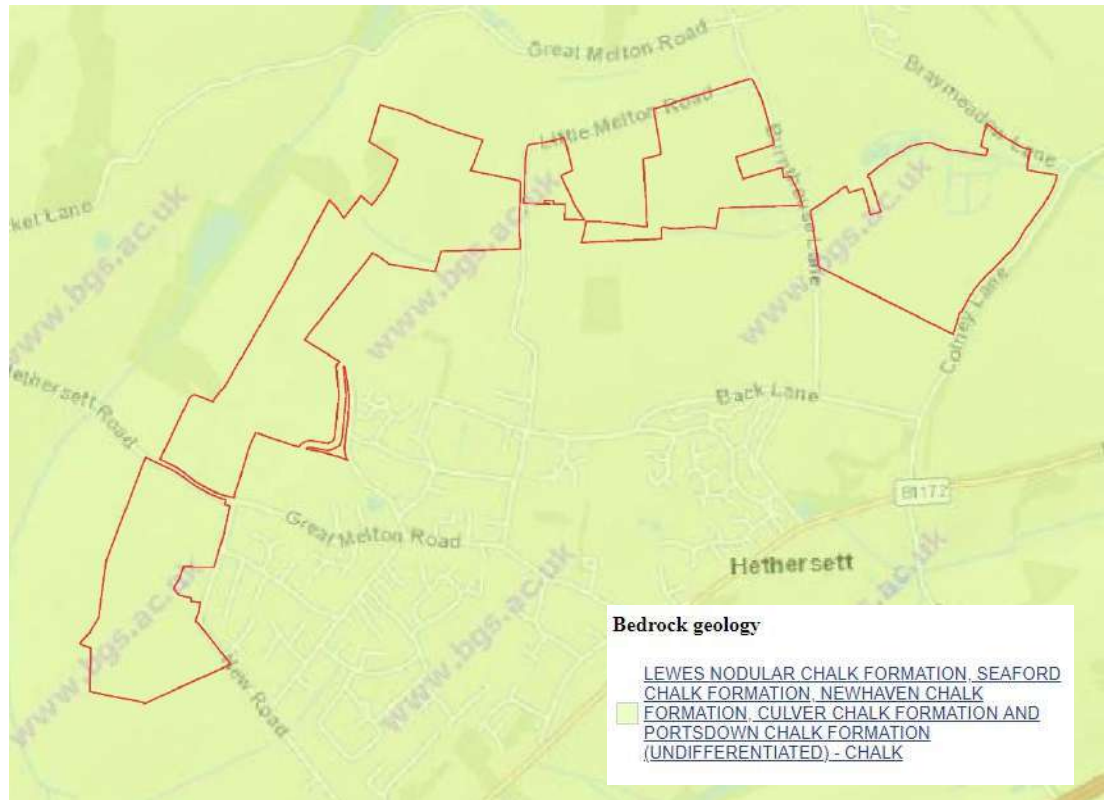
Fig. 3.1: British Geological Surveys – Superficial Geology Map



3.5 The Lowestoft formation (Diamicton) is unlikely to be suitable for infiltration drainage. Ground conditions will be investigated with a comprehensive programme of percolation testing to identify potential areas suitable for infiltration drainage. There is potential for infiltration within the Sheringham Cliffs Formation in the north-west corner of the site, due to topography this will not provide a Site wide drainage solution but an infiltration basin could provide an option for 'Area D' and potentially the Employment Area.

3.6 Figure 3.2, indicates that the Site is underlain by Chalk.

Fig. 3.2: British Geological Surveys – Bedrock Geology Map



3.7 Infiltration testing was undertaken as part of the existing planning permission 11/1804/O to the south/east of the Site. Poor soakage rates were encountered suggesting an alternative surface water solution needs to be identified.

3.8 If, as anticipated, the ground conditions are wholly or partially unsuitable for infiltration drainage then the next level on the Surface Water Drainage Strategy will be followed with a surface water discharge to a watercourse.

- 3.9 Surface water runoff to watercourses will be restricted to the appropriate natural (greenfield) runoff rate for the equivalent storm event. Attenuation storage will be provided for the 1% AEP¹ (100 year storm event) with appropriate allowance for climate change and urban creep. The Preliminary Drainage Strategy Plan is provided in **Appendix A** showing potential locations for attenuation storage structures and watercourses.
- 3.10 Exceedance flows i.e. runoff in excess of the design storm event will be routed to areas of least vulnerability to ensure there is no adverse impact on surrounding areas.

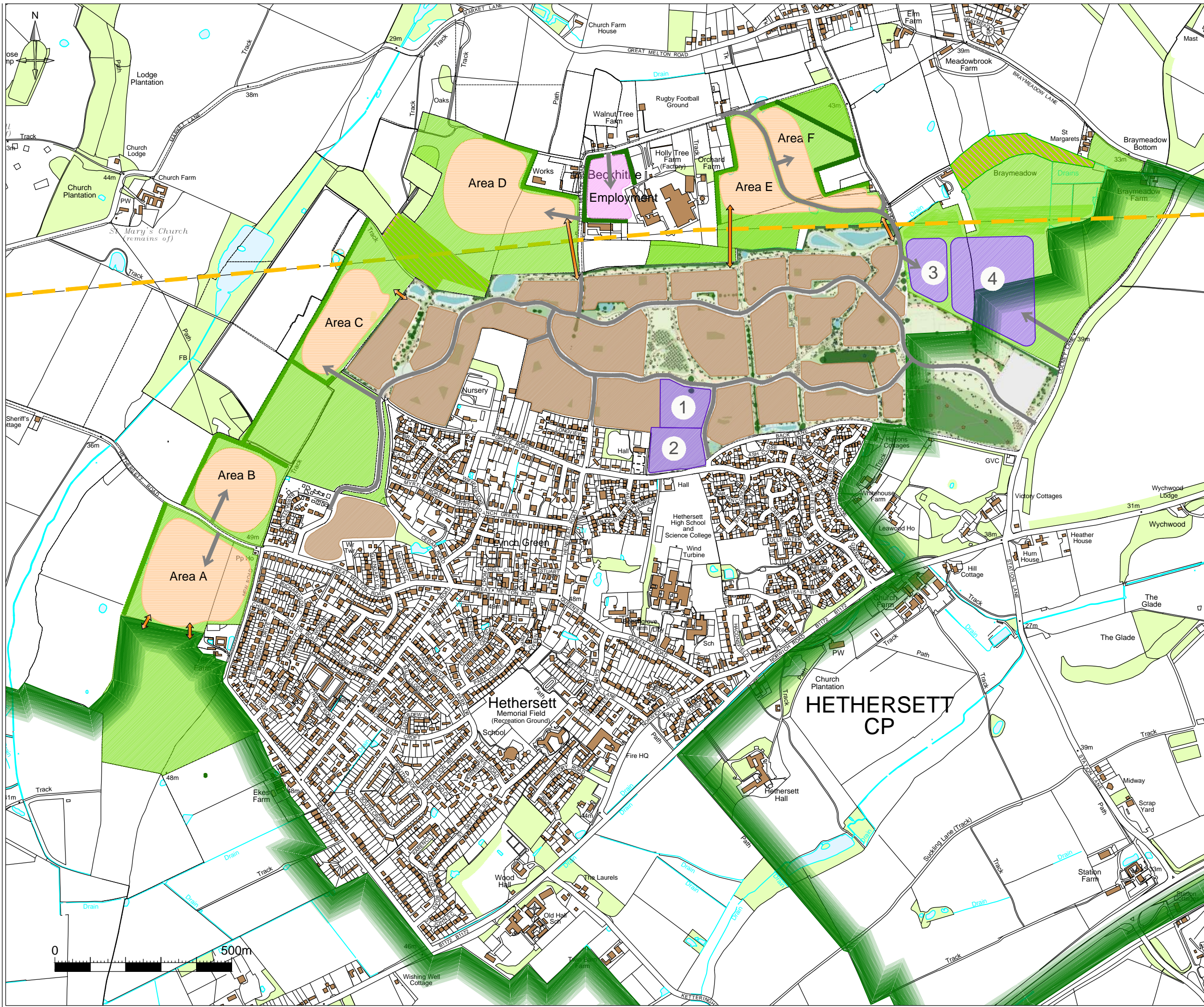
¹ Annual Exceedance Probability

4 Conclusion

- 4.1** This Flood Risk and Drainage Statement demonstrates that the Site is located in an area of Low flood risk and is therefore suitable for development. Surface water runoff can be managed using sustainable drainage methods to ensure no adverse flood risk impact on new and offsite development, or on the wider environment.

APPENDIX A

Concept Masterplan



- KEY**
- New Homes (Under Construction)
 - New Homes (Proposed)
 - Employment (Classes B1/B8)
 - Education
 - ① Site for relocated Woodside Primary School (by others)
 - ② Site for extension to Hethersett Academy (by others)
 - ③ Site for 2 FE Primary and Pre School
 - ④ Site for Combined Key Stage 3 and Sports Campus
 - New Access
 - Green Infrastructure / Amenity Space
 - Power Cable (Pylons Route)
 - County Wildlife Site
 - Strategic Gap
 - Pedestrian / Cycle Links


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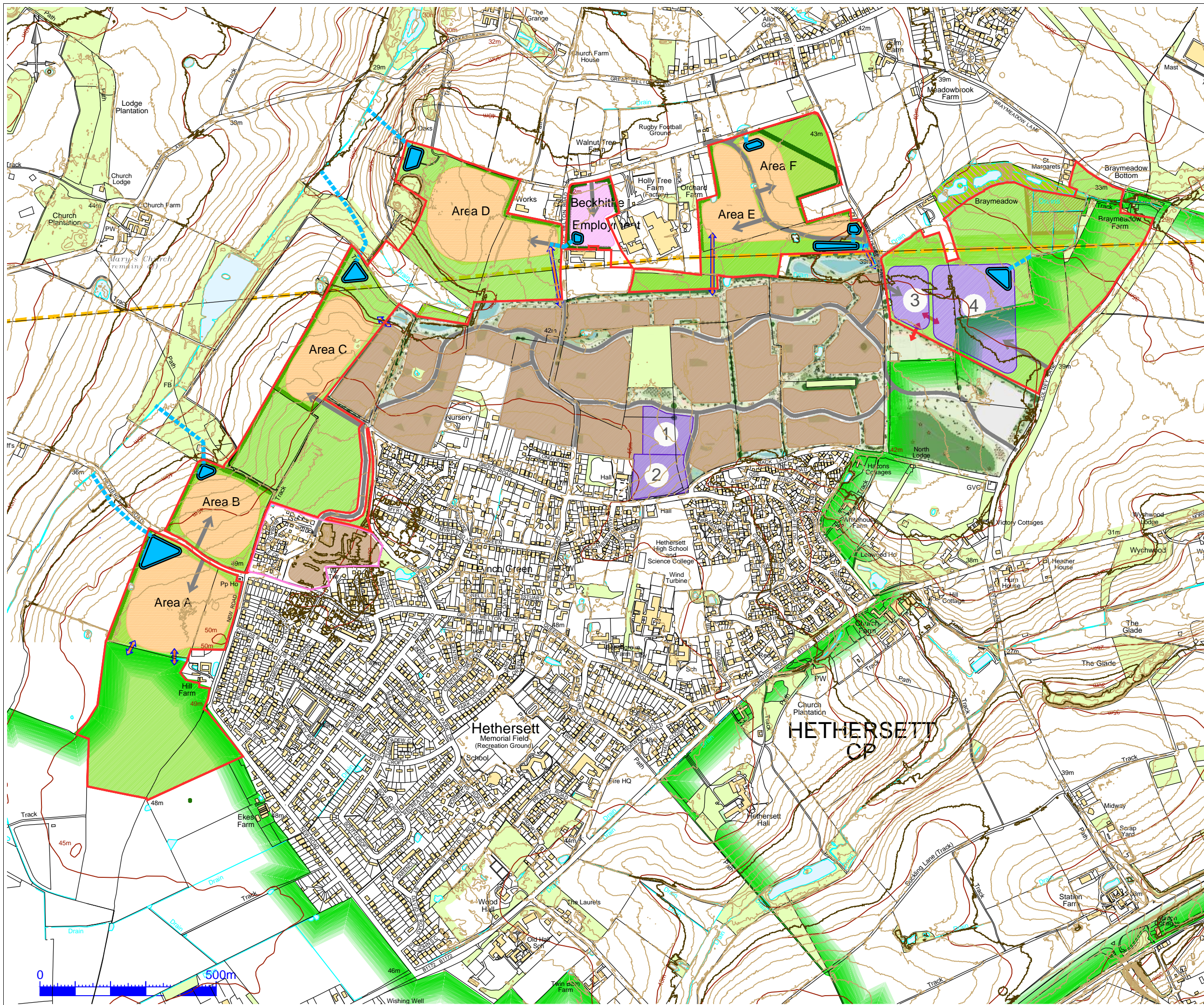
Drawing Title
Concept Masterplan

Project Name
Land North and West of Hethersett

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MP	-	1:10,000	A3
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03/03/2018	0088/004	D	

APPENDIX B

Surface Water Drainage Strategy Plan



Notes

1. Do not scale from this drawing.
2. Any dimensions should be checked on site.

Key

- Development Underway
- Site Boundary
- 10m Contour (Lidar)
- 1m Contour (Lidar)
- Flood Zone 3
- Indicative SuDS Pond
- Surface Water Outfall Route
- Strategic Gap
- Priority Habitats
- Beckhithe Meadow Nature Reserve
- Designated Green Space



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Drawing Title
**Initial Surface Water
 Drainage Strategy Plan**

Project Name
**Hethersett,
 Norfolk, NR9 3NP**

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MP	-	1:10,000	A3
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