



Flood Risk Assessment

Householder application for proposed extension
Land south of Ashfield Road
Norton Little Green
Bury St Edmunds

Mr & Mrs Jennings
Version 1 – April 2024



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Document Control Sheet

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1 Introduction

- 1.1 BHA Consulting Ltd (BHA) have been commissioned by Mr and Mrs Jennings to produce a Flood Risk Assessment in support of a householder application for a proposed extension, on land south of Ashfield Road, Norton Little Green, to be referred hereafter as 'the Site'. A Development Plan is provided in **Appendix A**.
- 1.2 The purpose of this report is to provide information on the flood risks associated with the proposed development and present mitigation measures as necessary to enable the development to proceed and meet the relevant design criteria. This is to be achieved by ensuring that the development is safe from flooding to recognised standards and does not increase the risk of flooding to neighbouring properties.
- 1.3 The report follows the guidance set out in:
 - National Planning Policy Framework (NPPF)
 - National Planning Practice Guidance.
- 1.4 The following data was reviewed as part of this assessment:
 - Environment Agency (EA) Flood Data
 - Babergh & Mid Suffolk Level 1 Strategic Flood Risk Assessment (SFRA) Final Report, JBA Consulting, August 2020
 - British Geological Survey's (BGS) 'Geology of Britain' on-line maps
 - We have also utilised our knowledge of the local area and experience in dealing with similar related matters.

2 Site Appraisal

Location

- 2.1 The Site is located on land south of Ashfield Road, Norton Little Green, approximately 1.4km north east Norton village, as shown in **Figures 2.1 and 2.2** below.



Figure 2.1: Site Location Plan

Figure 2.2: Site Location Plan: Aerial View

- 2.2 The Topographic Survey Plan (**Appendix B**) indicates that levels generally fall to the north west from around 60.5mAOD at the south eastern corner, to 59.7mAOD at the north western corner. Levels within the wider area generally fall to the west towards the Black Bourn.

Geology and Hydrogeology

- 2.3 The British Geological Survey (BGS) website lists the bedrock underlying the Site as the Crag Group (Sand). This is masked by superficial deposits of the Lowestoft Formation (Diamicton).
- 2.4 The Crag Group is designated as a Principal Aquifer (usually providing a high level of water storage to support water supply and/or river base flow on a strategic scale) and is a drinking water Source Protection Zone 3 (the outer protection zone) at this location.
- 2.5 The overlying superficial Lowestoft Formation is designated as a Secondary (Undifferentiated) Aquifer meaning it has variable permeability and drainage properties.

Hydrology

- 2.6 The Site is not connected to the wider watercourse network.

Flood Map for Planning

- 2.7 The development area of the Site is in a fluvial Flood Zone 1 as shown in **Figure 2.3** below. Land in a fluvial Flood Zone 1 has a less than 0.1% (<1 in 1000) annual exceedance probability (AEP) of flooding from rivers and/or the sea.



Figure 2.3: Flooding Map for Planning (Rivers and Sea) – Undefended Risk

3 Flood Risk

Potential Sources of Flooding

3.1 Potential sources of flooding that may affect the site have been reviewed and are summarised in the table below:

SOURCE	LIKELIHOOD
<p>Rivers and Sea:</p> <p>River flooding happens when a river cannot cope with the amount of water draining into it from the surrounding land. Sea flooding happens when there are high tides and stormy conditions.</p> <p>*This risk considers the presence and effect of flood defences in the area (defended). These defences reduce but do not completely stop the chance of flooding as they can be overtopped or fail.</p>	<p>Low</p> <p>(Source: EA Risk of Flooding from Rivers and Sea map, Figure 3.1)</p>
<p>Surface Water:</p> <p>This can result when high intensity rainfall falling onto impermeable surfaces (i.e. roofs and paved areas) or low permeability soils and geology (such as clayey soils) is unable to enter drainage systems or soak into the ground sufficiently rapidly. When this happens, the excess water can flow across the ground surface, including adjoining sites, and potentially cause flooding.</p> <p>Surface water flood risk is discussed in detail in Section 3.2 of this report. 0.1%AEP, 1%AEP and 3.3% AEP flood maps are provided as Appendix C.</p>	<p>Very Low to High</p> <p>(Source: EA Risk of Flooding from Surface Water map, Figure 3.2)</p>
<p>Groundwater:</p> <p>This can occur in areas where the groundwater level is high, when rainfall raises the prevailing groundwater level to an extent such that structures within the ground become at risk of inundation. Typically, this might include basements or drainage infrastructure.</p> <p>Information within the SFRA indicates that groundwater flooding in the whole study area is limited and very localised.</p>	<p>Negligible</p> <p>(Source: SFRA, Figure 3.3)</p>
<p>Adopted Drains:</p> <p>Sewer failure can be the result of overloading, leading to surcharge and the escape of water from manholes, gullies, etc. or, more commonly, because of blockage.</p> <p>*Any new sewers will be built to Building Regulation standards or adoptable standards, as applicable.</p>	<p>Very Low*</p> <p>(Source: SFRA, Figure 3.4)</p>
<p>Private Drains:</p> <p>The failure of small diameter private sewers is likely to be more common through lack of maintenance, but the consequences are likely to be less severe.</p>	<p>Very Low</p>
<p>Dam/Reservoir Breach:</p> <p>There are no reservoirs near the development site.</p>	<p>Very Low</p> <p>(Source: EA Risk of Flooding from reservoirs map, Figure 3.5)</p>
<p>Canals:</p> <p>There are no canals near the development site.</p>	<p>N/A</p>
<p>Flood Defences:</p> <p>There are no flood defences near the development site</p>	<p>N/A</p>
<p>Historical Flooding (Published Record Search):</p> <p>There are no recorded flood outlines shown near to the Site.</p>	<p>(Source: Groundsure, Figure 3.6)</p>

Table 3.1: Sources of Flooding

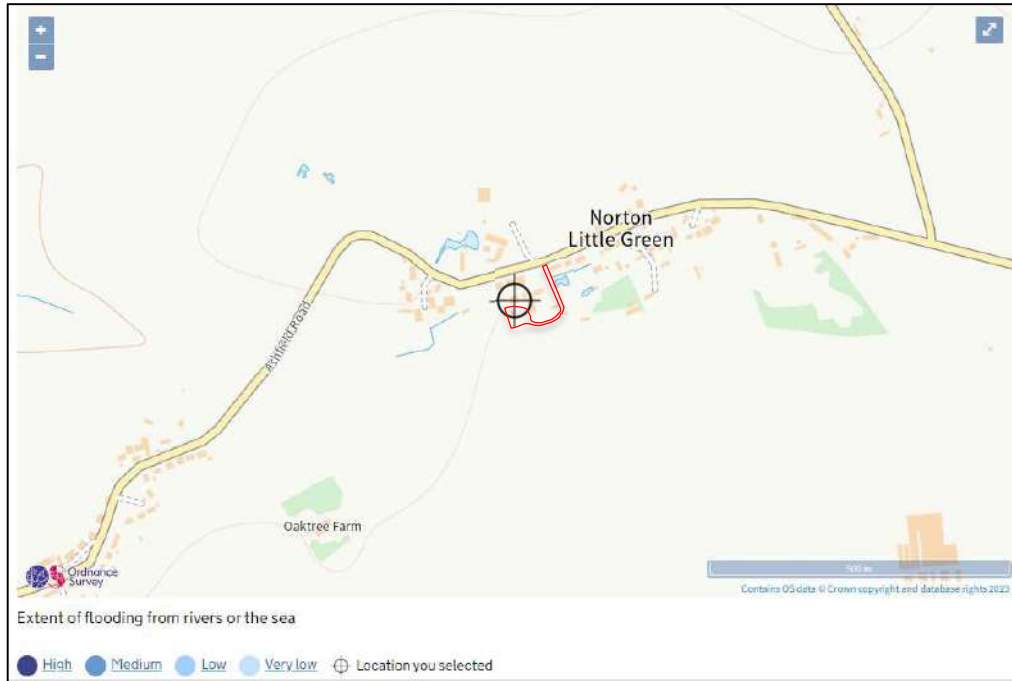


Figure 3.1: EA Risk of Flooding from Rivers and Sea Map (Defended – reflects the presence and effect of flood defences)

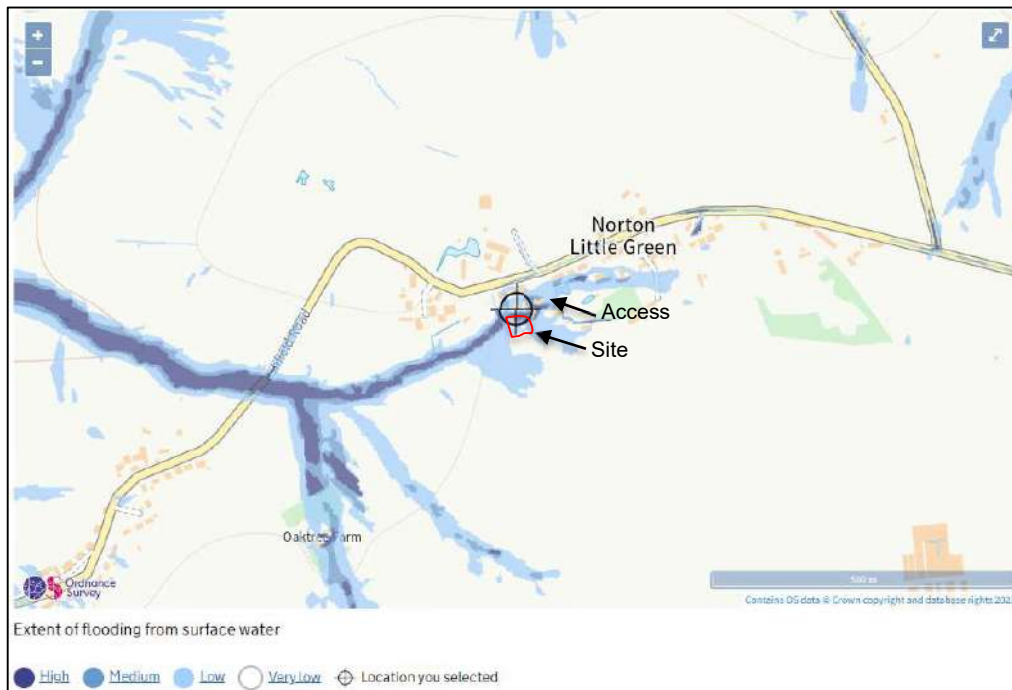


Figure 3.2: EA Risk of Flooding from Surface Water Map – All Risks

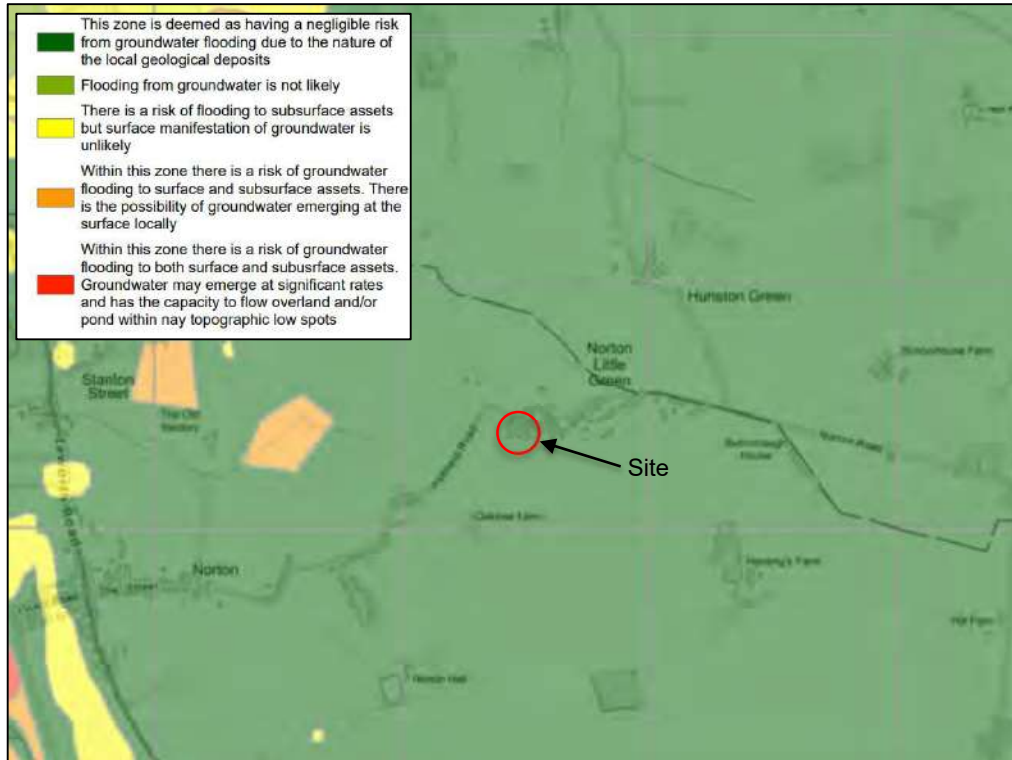


Figure 3.3: Risk of Flooding from Groundwater – SFRA

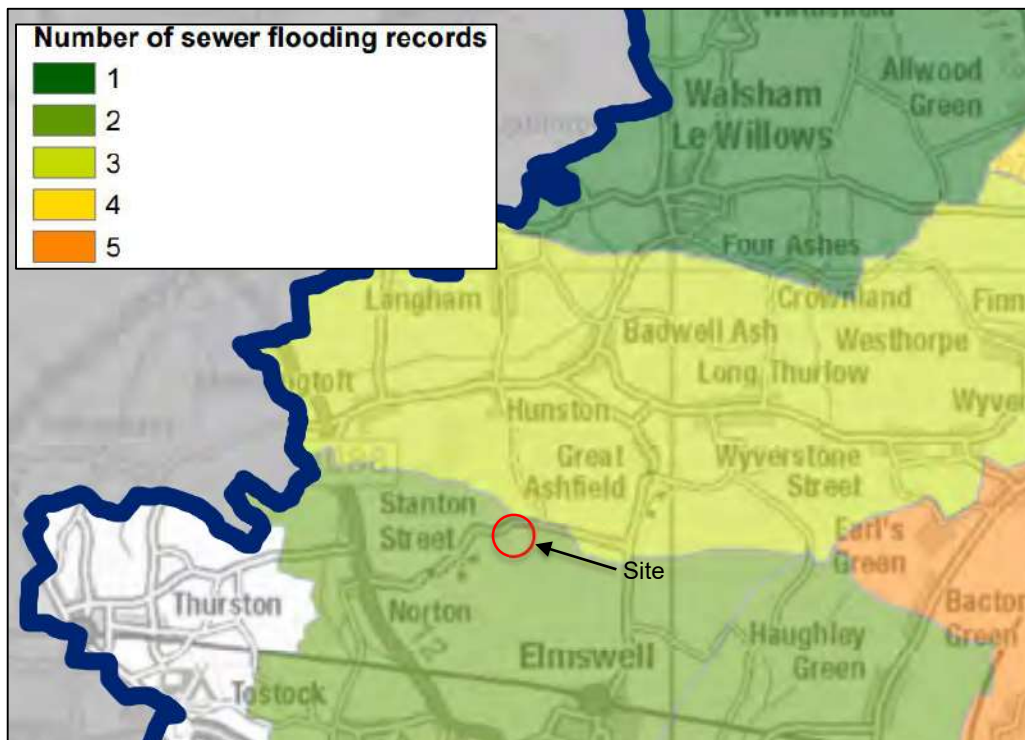


Figure 3.4: Anglian Water Sewer Flooding Records – SFRA

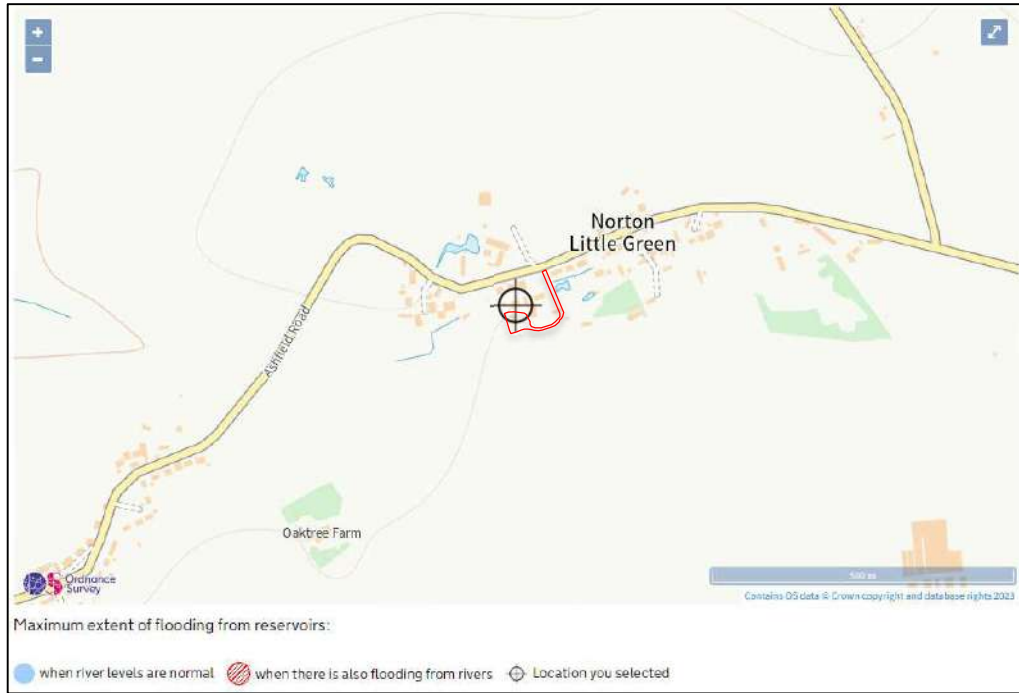


Figure 3.5: EA Risk of Flooding from Reservoirs



Figure 3.6: Recorded Flood Outlines (Source: Groundsure)

Flood Risk Summary

- 3.2 The Site lies in Flood Zone 1. Land and property in Flood Zone 1 have a less than 0.1% (<1 in 1000) annual exceedance probability (AEP) of flooding from rivers and/or the sea (very low risk).
- 3.3 The Site is at low risk from all other sources of flooding except for surface water flooding which is discussed in detail in **Section 4**.
- 3.4 There are no recorded historical flood events that have affected the Site.

4 Assessment of Surface Water Flood Risk and Mitigation Measures

- 4.1 The surface water flood maps generated from Environment Agency open-source data (data.gov.uk) in QGIS for the 3.3% AEP, 1% AEP and 0.1% AEP flood depths and flow directions are presented in full in **Appendix C**.
- 4.2 The required standard of protection from fluvial flood risk, as stipulated in the National Planning Practice Guidance is the 1 in 100 year (1%) AEP plus climate change flood event. The same standard of protection can be applied to areas at risk from surface water flooding. Extracts of the 1% AEP and 0.1% AEP surface water flood maps are annotated and presented below. The 1% AEP (low risk) is generally accepted to represent a present day scenario. The 0.1% AEP (very low risk) is generally accepted to represent the 1% AEP + climate change flood event (i.e flood protection for the development lifetime.)

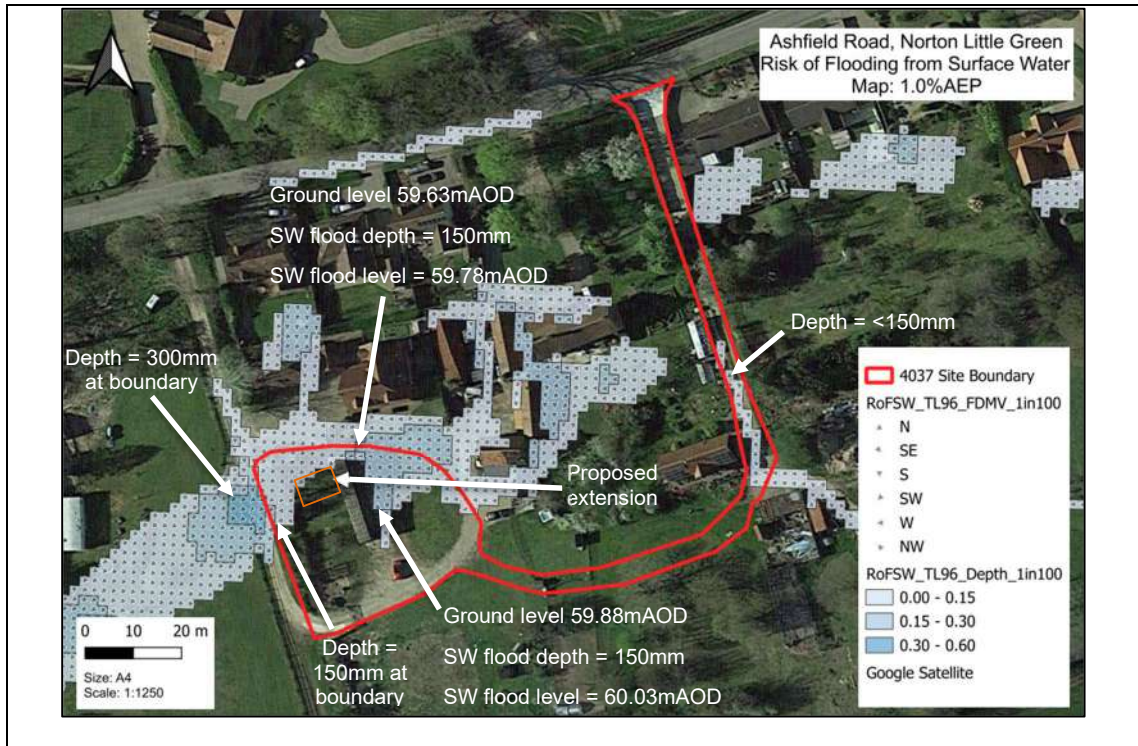


Figure 3.7: Surface water flood map 1% AEP (low risk) overlaid on aerial image.

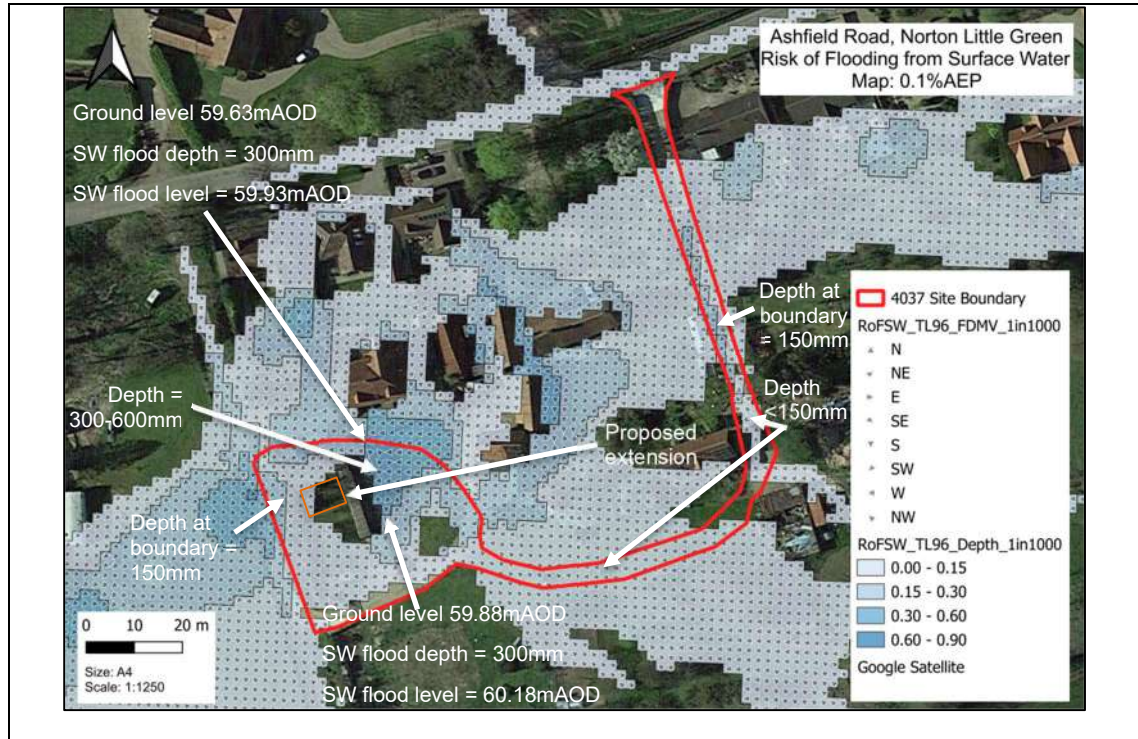


Figure 3.8: Surface water flood map 0.1% AEP (very low risk) overlaid on aerial image (~1%AEP + climate change)

Surface Water Flood Risk to Existing Access Road

- 4.3 **Figure 3.7** above indicates that for the 1% AEP (low risk) surface water flood event, the proposed access route is affected by localised areas of <150mm depth surface water flooding. **Figure 3.8** indicates that for the 0.1% (very low risk) surface water flood event, the flood area increases, however, the depth of flooding generally remains <150mm, or slightly greater in localised areas.
- 4.4 It is concluded that the risk of surface water flooding to the proposed access road does not significantly increase between the low risk and very low risk events, and thus for the development lifetime. Flood depths for the proposed access road are predominantly <150mm, with localised areas <300mm.

Surface Water Flood Risk to Existing Dwelling

- 4.5 **Figure 3.7** above indicates the 1% AEP low risk surface water flood depth, predominantly alongside the north and east of the existing dwelling, to be between 0mm and 300mm depth. However, there are two 150mm depth boundaries which have been used to aid a comparison between the 1% AEP low risk and 0.1% AEP very low risk surface water flood events. **Figure 3.8** indicates that the depth of flooding at these depth boundary increases to 300mm for the 0.1% very low risk surface water flood event.
- 4.6 Topographic levels taken from the two surface water depth boundaries indicate ground levels of 59.63m AOD and 59.88m AOD with corresponding surface water flood levels of 59.78m AOD and

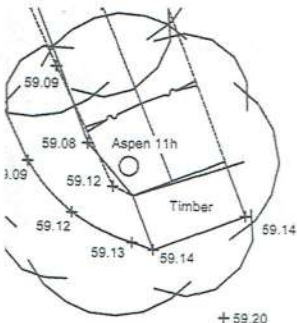
60.03mAOD, respectively, for the 1% AEP low risk surface water flood event which increase to 59.93mAOD and 60.18mAOD for the 0.1% AEP very low risk flood event. Levels information is provided on **Figures 3.7** and **3.8**, respectively.

- 4.7 It is concluded that to ensure the protection of people and property for the development lifetime the finished floor level of the extension should be set at 60.48mAOD. This provides a 300mm freeboard against surface water flood levels.

5 Conclusions and Recommendations

- 5.1 This flood risk assessment has been commissioned in support of a householder application for a proposed extension, on land south of Ashfield Road, Norton Little Green.
- 5.2 The Site is at low risk from all sources of flooding except for surface water flooding which has been discussed in detail in **Section 4**.
- 5.3 The evaluation of the potential risk of surface water flooding affecting the site access reveals that the depth of surface water flooding on the proposed access road does not exhibit a significant increase between the low risk and very low risk surface water flood events, and flood depths remain <300mm for up to the 0.1% AEP (very low risk) scenario.
- 5.4 It is recommended to set the finished floor level of the proposed extension at 60.48mAOD. This provides a 300mm freeboard against potential surface water flood levels.
- 5.5 In summary, the recommendations presented in this report are designed to ensure the protection of both people and property throughout the development lifetime. Furthermore, by incorporating a sustainable drainage strategy that includes infiltration and rainwater harvesting opportunities off site flood risk will not be increased.

Appendix A: Development Plan



EL 62.23
Private garden

+59.23 Gravel
+59.20

Private garden

Private garden

Grass

59.28
59.26

MH CL 59.39

RL 63.31

EL 61.83

Small trees/brambles 5h

DP

Pan 1.8h

Grass

1.5h

Grass

59.47

59.50

59.51

EL 62.84

59.63

59.83

59.57

59.68

59.68

59.68

59.68

59.68

59.68

59.68

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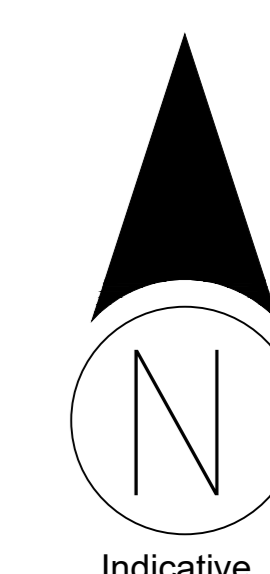
59.68

59.68

59.68

59.68

Appendix B: Topographic Survey



General

The contractor must check and verify all site and building dimensions, levels, utilities and drainage details and connections prior to commencing work. Any errors or discrepancies must be notified to Alpha Surveys immediately.

The accuracy of the digital data is the same as the plotting scale implies. All dimensions are in metres unless otherwise stated.

The survey control listed is only to be used for topographical surveys at the stated scale. All control must be checked and verified prior to use. Please do not scale from this drawing.

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Control Table

Control ID	Easting	Northing	Elevation	Description
ST01	597576.076	266406.984	59.963	Mag Nail
ST02	597591.995	266364.476	59.184	Mag Nail
ST03	597608.671	266319.719	60.263	Nail
ST04	597636.754	266332.589	60.609	Mag Nail
ST05	597660.014	266341.857	60.903	Nail
ST06	597686.208	266337.827	61.837	Nail
ST07	597703.348	266365.362	61.832	Mag Nail
ST08	597680.949	266420.151	61.078	Mag Nail

SURVEY GRID AND LEVEL DATUM

The coordinate system established for this survey is related to OSGB36-15 (OS) national grid at a single point using Leica GPS and then orientated to grid north with a scale factor of 1.000.

The level datum established for this survey is related to OSGB36-15 (OS) using Leica GPS.

REV	DESCRIPTION	DRAWN	DA

SITE ADDRESS
**LITTLE OWL LODGE, ASFIELD ROAD,
 NORTON, BURY ST EDMUNDS, SUFFOLK.**

DRAWING DESCRIPTION
TOPOGRAPHICAL SURVEY

CLIENT
MR & MRS JENNINGS

SURVEYOR	SURVEY DATE	DWG STATUS	REVISION	ISSUE DATE
MGC	15.11.2021	FINAL	-	18.11.202

DRAWING NUMBER	SCALE
AS1603-01	1:200-A1


Alpha Surveys

Tel No: 01359 232649
 Mob No: 07775 847287
 alphasurveys@outlook.com
 Topographical Surveys - Measured Building Survey





Appendix C: Risk of Flooding from Surface Water Maps - 0.1%, 1% and 3.3% AEP

Ashfield Road, Norton Little Green
Risk of Flooding from Surface Water
Map: 0.1%AEP




 4037 Site Boundary

RoFSW_TL96_Depth_1in1000

-  0.00 - 0.15
-  0.15 - 0.30
-  0.30 - 0.60
-  0.60 - 0.90

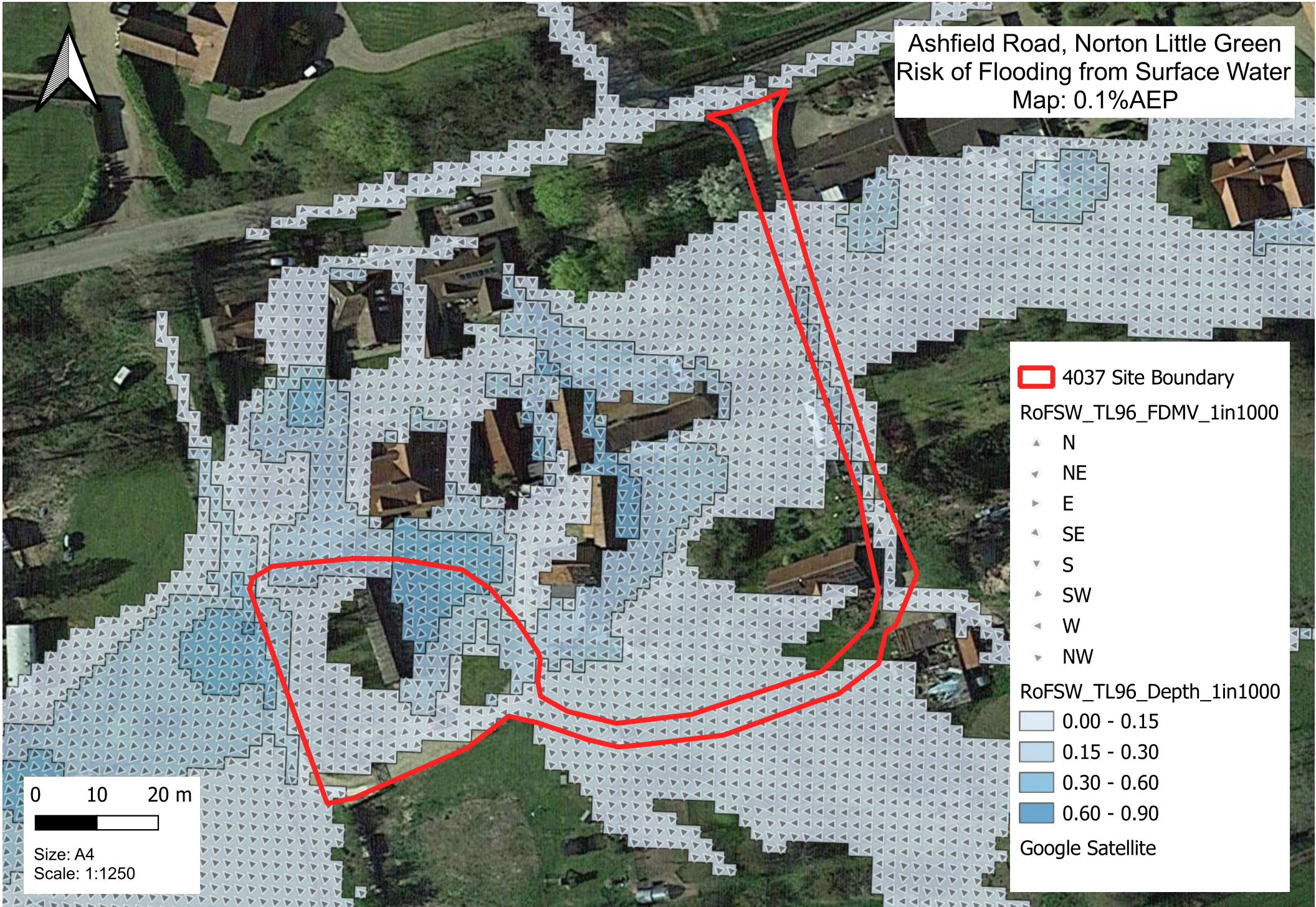
Google Satellite

0 10 20 m



Size: A4
Scale: 1:1250

Ashfield Road, Norton Little Green
Risk of Flooding from Surface Water
Map: 0.1%AEP



Ashfield Road, Norton Little Green
Risk of Flooding from Surface Water
Map: 1.0%AEP




- 4037 Site Boundary
- RoFSW_TL96_Depth_1in100
 - 0.00 - 0.15
 - 0.15 - 0.30
 - 0.30 - 0.60
- Google Satellite







0 10 20 m
Size: A4
Scale: 1:1250

Ashfield Road, Norton Little Green
Risk of Flooding from Surface Water
Map: 1.0%AEP






 4037 Site Boundary

RoFSW_TL96_FDMV_1in100

-  N
-  SE
-  S
-  SW
-  W
-  NW

RoFSW_TL96_Depth_1in100

-  0.00 - 0.15
-  0.15 - 0.30
-  0.30 - 0.60

Google Satellite


0 10 20 m




Size: A4
Scale: 1:1250


Ashfield Road, Norton Little Green
Risk of Flooding from Surface Water
Map: 3.3%AEP




 4037 Site Boundary

RoFSW_TL96_Depth_1in30

 0.00 - 0.15

 0.15 - 0.30

 0.30 - 0.60

Google Satellite


0 10 20 m









Size: A4
Scale: 1:1250

Ashfield Road, Norton Little Green
Risk of Flooding from Surface Water
Map: 3.3%AEP






 4037 Site Boundary

RoFSW_TL96_FDMV_1in30

-  N
-  SE
-  S
-  SW
-  W
-  NW

RoFSW_TL96_Depth_1in30

-  0.00 - 0.15
-  0.15 - 0.30
-  0.30 - 0.60

Google Satellite

0 10 20 m



Size: A4
Scale: 1:1250