



J ROBERTS DESIGN LTD
STRUCTURAL AND CIVIL ENGINEERING CONSULTANTS

New Dwelling
Hillsborough House, Boat Lane
Hoveringham
NG14 7JP

FLOOD RISK ASSESMENT

Client – Grace Machin

2411 / Jan 2021

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1 INTRODUCTION

This assessment has been undertaken in accordance with the National Planning Policy Framework (NPPF). It uses information of the existing topography, existing surface water drainage systems, historical flood records and simulated flood maps. Strategic Flood Risk Analysis (SFRA) published by the Newark and Sherwood District Council and the Greater Nottinghamshire Council have been consulted, the latter being the more recently produced.

Relevant information was also sought from the Environment Agency (EA). Possible sources of flooding will be identified and a careful evaluation will be carried out to determine the level of risk they each pose to the development. The effect of climate change will also be taken into consideration, as well as the off-site impact caused, if any, by the proposed development.

This Flood Risk Assessment has been prepared in support for a proposed development located to the rear of Hillsborough House, Boat Lane, Hoveringham, NG14 7JP. The Site is located approximately 14.9km northeast of Nottingham, grid reference E470222, N346555.

This report aims to assess the risk of flooding for the residential development consisting of a single two-storey dwelling.

Should a risk of flooding be of significance, the report will aim to provide measures to minimise the impact upon the development throughout its design life, as well as the local area, and to protect against the threat to life.

The sequential has been done by a third party and is included within the Appendix. A minimum FFL of **17.54mAOD** is recommended to provide 600mm of protection above the estimated flood level of 16.94mAOD.

2 DEVELOPMENT AND SITE LOCATION

2.1 Site Location

The site is located some 14.88km northeast from the centre of Nottingham. The development site falls within the Greater Nottinghamshire District Council (GNDC). The site also falls within the local Newark and Sherwood District Council, although the SFRA carried out by the GNDC is more current. The Ordnance Survey grid reference for the site is E470222, N346555 (see Site Location in **Appendix A**).

The nearest main rivers are the River Trent and the Dover Beck, which are approximately 270m southeast and 1500m southwest, respectively.

The site is the village of Hoveringham which consists of residential housing and local amenities. The village is surrounded by agricultural land. There are lakes near the town which are approximately 1000m northwest and 770m northeast. There are other bodies of water such as fisheries and small lakes.

The Causeway Dyke draws water from drains that run either side of village of Hoveringham and meet at the north side to drain into the River Trent. There are a number of unnamed drains around Hoveringham.

2.2 Site Description

The development proposal is for a residential development comprising of a single two storey dwelling with landscaping and access roads. A site plan is available in **Appendix B**.

The development would be classed as infill as the land is a greenfield site that is currently a garden to another residential property. The total gross site area amounts to approximately 1055m².

The general levels of the site range from 17.06 to 17.35 metres Above Ordnance Datum (mAOD). There is a slight high spot in the centre of the site which then fall to the east and west of the plot. (see Existing Levels Plan in **Appendix C**).

From BGS data the site is underlain by superficial deposits of Holme Pierrepont sand and gravel member - sand and gravel and bedrock of Gunthorpe member – Mudstone.

2.3 Classification of Vulnerability

Table 2 of the Technical guidance to the NPPF, the classification of the proposed development is in the 'More Vulnerable' category.

2.4 Flood Zone Classification

The Environment Agency's flood map (see Environment Agency information in **Appendix D**), shows the western half of the development is located in Flood Zone 2 and the eastern half in Flood Zone 1.

(Flood Zone 2: This zone comprises land assessed as having between a 1 in 100 and 1 in 1,000 annual probability of river flooding (1% – 0.1%), or between a 1 in 200 and 1 in 1,000 annual probability of sea flooding (0.5% – 0.1%) in any year).

The Newark and Sherwood SFRA identifies the site as being within a Flood Zone 2 (**Appendix E**).

By the SFRA definition a Flood Zone 2 is classified as land having between 1 in 100 and 1 in 1000-year annual probability of fluvial flooding. It is classed as an area of 'medium probability' risk of fluvial flooding.

2.5 Local Development Plan

The district Council is seeking to meet the Objectively Assessed Housing Requirement, which states a requirement of 9080 dwellings by the year 2033. The site is outside of the defined settlement hierarchy.

The Amended Core Strategy 2019 states that a key issue is providing additional housing, including the delivery of affordable homes. Another key issue stated is identifying and securing those infrastructure improvements that need to accompany the significant growth envisaged for the district, highlighting a need for new housing.

The architectural and historic build environment and the District's archaeology should be protected and enhanced. This is especially the case within the Nottingham Derby Greenbelt, in which the site is located (**Figure 1**).

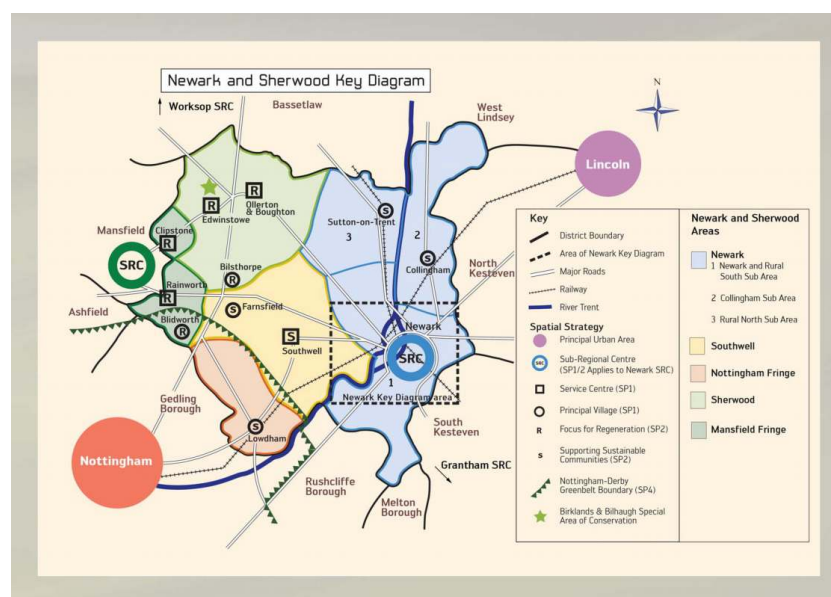


Figure 1 - LDF Newark and Sherwood Key Diagram

The need for new housing is clearly stated by the Core Strategy, providing new buildings and spaces will be well designed, with a strong sense of place that builds on local character.

The site development would be described as an infill which is considered to be consistent with the aims of Local Development Framework (LDF).

2.6 Sequential and Exceptions Test

The site is classified as 'more vulnerable' in Table 2 of the NPPF Technical Guidance, and as such, requires sequential and exceptions tests. The aim of the sequential test is to ascertain whether there is a more suitable location that is not located within a lower flood zone. The Exceptions test is designed to evaluate the value of the proposed development to the local area.

Sequential Test

A sequential test has been undertaken by Grace Machin with the following statement: -

'We have assessed the suitability of other potential sites in Hoveringham however the only realistic option for the applicants, Mr & Mrs Nind, is developing on their own land. Carol Nind has lived in the village for 45 years and Carol and Trevor Nind have lived together in the village for 25 years.'

The Ninds have considered other nearby villages and have been searching for an alternative site or property for several years now but to no avail. They most definitely would prefer to stay in a Hoveringham the village they know, familiar faces, familiar surroundings and local community. They hope support can be given to them so that they can build a modest home suitable for them to live in as they get older. The majority of the application site is in Flood Zone 1. However Flood Zone 2 does cross into the Site. Sites elsewhere in the village are at a higher risk of flooding and in Flood Zone 3. Furthermore all sites appear to be already occupied and we are not aware that the owners have specifically promoted any of these sites for residential development. As a result we consider making a proposal for the development of a single dwelling on their own surplus land at Hillsborough House to be the only realistic and viable option for Carol and Trevor Nind. For these reasons we consider that the sequential test element of this application proposal has been 'passed'.

Exceptions Test

It is considered the proposal will provide wider sustainable benefits in providing higher standard housing to support regeneration of the existing area and would be a benefit the wider area by increasing the level of available housing, whilst also providing additional customers for the local economy.

The Newark and Sherwood Plan Review states a requirement for some 9080 houses over the plan period. According to the Plan Review a number of dwellings have already been completed since the inception of the report. The final figure of dwellings allocated to be built in the plan period 2013-2033 in the Sub-Regional Centre, Service Centres and Principal Villages is 8806.

Development within the village of Hoveringham is addressed in Spatial Policy 3. The village of Hoveringham has reasonable access links to Newark Urban areas, Service Centres and other Principal Villages. Both bus and rail transportation is available within a reasonable distance to the site. Hoveringham also has a range of local services within a reasonable distance. The village of Lowdham is a larger village with more amenities and is 7-10 minutes away by car.

The proposed plans are to build an additional dwelling within the village of Hoveringham that is in keeping with the local aesthetics and character. The development is classed as an infill development. The proposal site is for a single dwelling and does not result in the joining of outlying areas into the village of Hoveringham.

Paragraph 4.25 of the Plan Review specifically supports the building of small-scale developments within gardens, commercial premises, farm yards and community; the former of which is where the proposed dwelling is to be situated.

The proposal site is in the Nottingham-Derby Green Belt, although Spatial Policy 4B states that consideration is given to development of 'Rural Affordable Housing Exceptions Sites' within Hoveringham. The proposal is sufficiently 'small scale'. The national Green Belt Policy need not be applied, given that the site falls within Spatial policy 4B exception criteria.

As it is considered there are no alternative sites in a lower flood zone and this report demonstrates the development will be safe without increasing flooding elsewhere. The development offers wider sustainable benefits by providing additional housing and additional customers for the local economy. It is considered that the proposed development meets the requirements of the Exceptions Test.

3 DEFINITION OF THE FLOOD HAZARD

The sources of flooding that could potentially affect the site are; -

- Flooding from water courses
 - The River Trent
 - Dover Beck
 - Causeway Dyke
- The local water bodies
 - Railway Lake
 - Trent View Fishery
 - Widgeon Lakes
 - Unnamed waterbodies
- Flooding from land
- Flooding from sewers
- Flooding from ground water

The map of the main rivers is attached in **Appendix F**.

3.1 The River Trent

It is considered that fluvial flooding represents the worst-case scenario rather than tidal flooding, and therefore fluvial flooding is considered over tidal flooding. The River Trent located is some 270m to the southeast of the development site at its nearest point and represents the greatest risk of flooding to the site. The River Trent is extensively monitored, being a river that receives a large amount of water and has being known to flood in the past.

Since the historic flood event in 1947 there is increased monitoring of the Trent and better understanding of flood risk/management. The site has never flooded historically in living memory and that Mrs Nind's family have been farmers in the village for three generations.

The section of the River Trent closest to the site has no formal EA maintained flood defences. The EA information includes modelled water level results for various storm events of the River Trent. Table 1 below details a summary of the information most relevant to the site. The modelled EA flood levels for the River Trent flood scenarios can be found in **Appendix D**.

Table 1 - Modelled results of the River Trent at the points closest to the site

| Node Point | Location | 100YR | 100YR + CC | 200YR | 1000yr |
|------------|----------------|-----------------|-----------------|-----------------|-----------------|
| | | Level (mAOD) | Level (mAOD) | Level (mAOD) | Level (mAOD) |
| 403556380 | SK 71217 46936 | 16.33 | 16.54 | 16.43 | 16.90 |
| 403556880 | SK 70782 46458 | 16.54 | 16.73 | 16.63 | 17.04 |
| 403557620 | SK 70178 46110 | 16.82 | 17.05 | 16.94 | 17.41 |

The EA flood map dictates that the site would flood above a 1 in 100 year storm event. Table 1 indicates that a 1 in 100 year +CC (plus climate change) is the worst-case scenario which corresponds with the flood maps provided by the EA.

According to the Trent Floodplain maps the 1 in 100 year + CC flood levels are circa 16.94mAOD. It is proposed that the finished floor level (FFL) of the site will be a minimum of 600mm above this flood level. It is therefore proposed that **the minimum FFL of the site is 17.54mAOD**. The 1 in 1000yr event predicts water levels circa 17.30mAOD therefore provides 240mm of additional flood protection against future climate change.

The average ground level for the location of the new dwelling is around 17.20mOAD, therefore the proposed minimum FFL is 340mm above the existing average ground level.

The River Trent is a wide river surrounded by a low and flat landscape, therefore any flooding would be expected to occur slowly and thus there would be adequate warning.

3.2 Dover Beck

The Dover Beck originates in Woodborough as the culmination of various dykes, streams and drainage ditches. It flows southwest into the River Trent. From the EA data the modelled levels stop increasing after the 1 in 10-year storm event scenario. It is assumed the banks of the Dover Beck have been overtopped and spreads out over the landscape around the watercourse. According to the EA flood maps, the site is not at risk of flooding from the Dover Beck (**Appendix D**).

Table 2 - Modelled results of the Dover Beck at the points closest to the site

| Node Point | Location | 100YR Level (mAOD) | 100YR + CC Level (mAOD) | 200YR Level (mAOD) |
|------------|----------------|--------------------------|-------------------------------|--------------------------|
| DBK_2428 | SK 68464 46393 | 18.07 | 18.07 | 18.07 |
| DBK_2030 | SK 68699 46292 | 17.80 | 17.80 | 17.80 |
| DBK_1829 | SK 68699 46122 | 17.68 | 17.68 | 17.68 |

3.3 Causeway Dyke

The Dyke flows around the village of Hoveringham on two sides, from south to north, converging into one watercourse which then discharges into the River Trent. The purpose of the Dyke is to carry surface water away and around the village of Hoveringham to the River Trent.

The land surrounding Hoveringham flooded in 1947 as a result of flooding occurring from the Causeway Dyke. The development site and large parts of Hoveringham were not affected by the 1947 flood event (see historic flood map in **Appendix E**).

There is no known history of flood waters from the Causeway Dyke affecting the proposal site. The risk of flooding from the Causeway Dyke is therefore considered to be low.

3.4 Flooding from Land

Surface water (pluvial) flooding is defined as flooding caused by rainfall-generated overland flow before the runoff enters a watercourse or sewer. In such events, sewerage and drainage systems and surface watercourses may be entirely overwhelmed. Pluvial flooding will usually be the result of extreme rainfall events, though may also occur when lesser amounts of rain falls on land which has a low permeability and/or is already saturated, frozen or developed. In such cases overland flow and 'ponding' in topographical depressions may occur.

The topography of the immediate surrounding land is of a shallow fall to the southeast of the site. The land surrounding the site also falls in the same direction towards road. Surface water flooding is likely to be contained within the highways and channelled into the local sewer network or run off towards lower lying land.

The Environment Agency Long Term Flood Risk Map (LTFM) identifies that the site is not at risk of any surface water flooding (**Figure 2**). The LTFM identifies:

Low Risk (0.1% (1 in 1000yr) - 1% (1 in 100yr) chance of flooding): - There is no noted surface water flooding.

Medium Risk (1% (1 in 100yr) – 3.3% (1 in 30yr) chance of flooding): - There is no noted surface water flooding.

High Risk (greater than 3.3% (1 in 30yr) chance of flooding): - There is no noted surface water flooding.



Figure 2 – Surface Water Flood Risk

It is considered flooding of the site from overland flows is unlikely.

3.5 Flooding from Sewers

Existing sewers are located within Boat Lane.

There is no apparent history of sewer flooding. In the event of an extreme storm event or a blockage, sewers could be overwhelmed followed by surface flooding within the road infrastructure. Any flood waters would be likely to be contained within the roads and would flow away from the site.

As the site is elevated above the road it is very unlikely sewer flooding would affect the site.

The risk of flooding of the site from sewers is therefore considered to be very low.

3.6 Flooding from Ground Water

Groundwater flooding is the emergence of water from beneath the ground, either at a specific point or at different locations. The effect is usually local and does not usually pose a significant risk to life. Groundwater flooding can, however, cause significant property damage and lead to ground instability.

There are several factors that can lead to groundwater flooding including prolonged rainfall, high in bank river levels, artificial structures, groundwater rebound and mine water rebound. Developments that are in areas susceptible to groundwater will not always be suited to SuDS, dependent on a detailed site investigation and risk assessment. The SFRA groundwater susceptibility is only an indicator of where water might emerge, not the probability that it will emerge. The SFRA states the site is >75% susceptible to groundwater flooding, see **Figure 3** below.

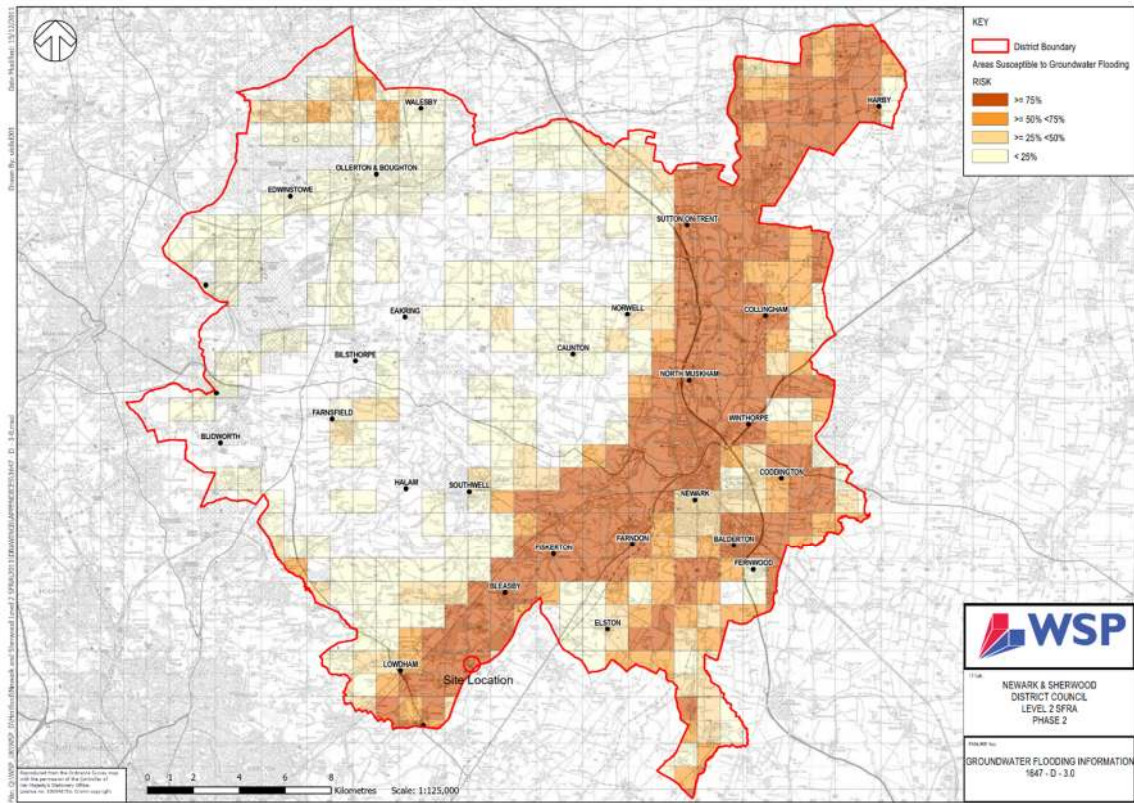


Figure 3 – SFRA Groundwater Potential

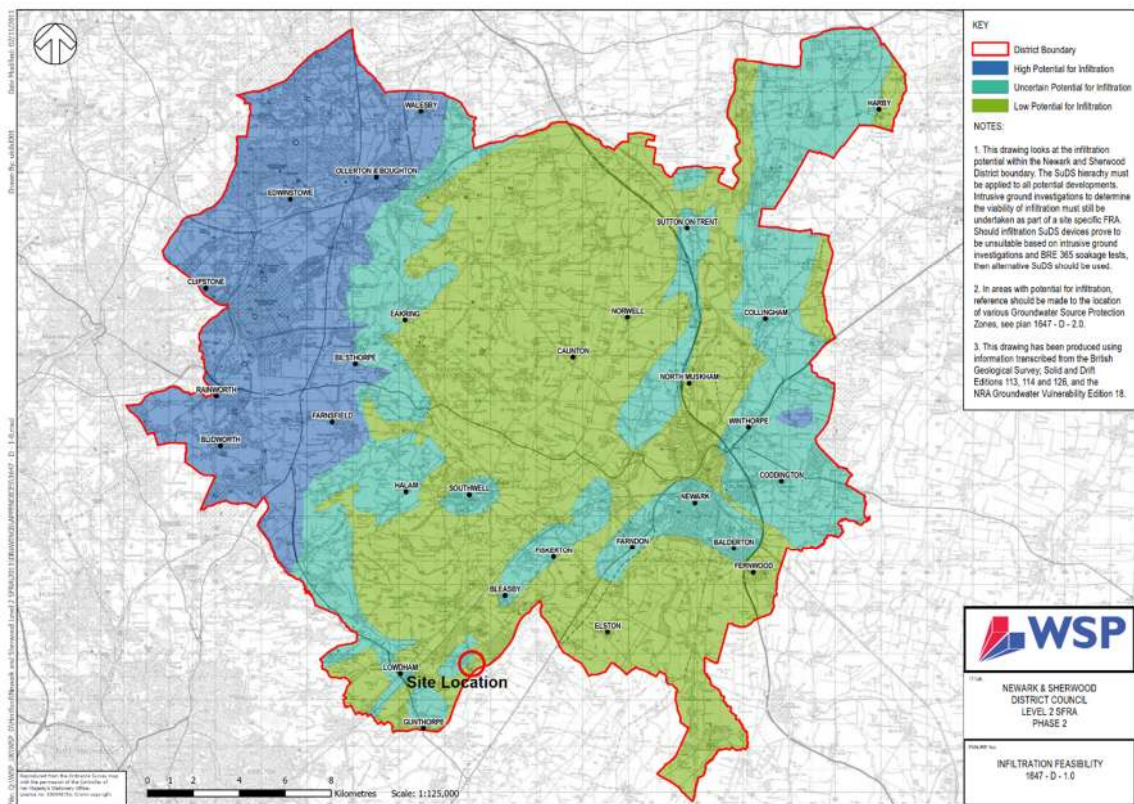


Figure 4 - Infiltration Potential

The SFRA identifies that the potential for infiltration is low (**Figure 4**).

There are no known records of ground water flooding in the vicinity of the site. It is recommended that percolation testing is commenced to confirm the ground condition and it is recommended to check the site ground water table is at sufficient depth as not to be a risk, or source of flooding, for the development site.

From BGS data the site is on superficial deposits of Holme Pierrepont sand and gravel member - sand and gravel. The site sits above a bedrock of Gunthorpe member - mudstone. There is no relevant data for nearby boreholes on the British Geological Survey (BGS) website to further confirm the bearing strata.

3.7 Flooding from Waterbodies

The risk of direct flooding from the surrounding waterbodies is considered to be very low as large water bodies tend to be actively managed. The water levels are likely to be linked with the water levels within the surrounding water courses and the River Trent, therefore the highest risk to the development is flooding from the River Trent.

4 THE PROBABILITY OF FLOODING

4.1 Probability of Flooding

According to the EA and SFRA flood maps the site is located within Flood Zone 2: This zone comprises land assessed as having between a 1 in 100 and 1 in 1,000 annual probability of river flooding (1% – 0.1%), or between a 1 in 200 and 1 in 1,000 annual probability of sea flooding (0.5% – 0.1%) in any year. The Newark and Sherwood's SFRA also locates the site within a flood zone 2.

The EA do not maintain any defences along the particular stretch of the River Trent that is relevant to the site.

Overtopping is generally unlikely as the River Trent is a well-maintained river with wide embankments, however during extreme weather events the banks could potentially be overtopped. The flow is slow over a wide section of river. Should the banks overtop, it would occur slowly, allowing sufficient time for warnings to be issued.

The Dover Beck is unlikely to cause any flooding to the site. According to the EA data the Dover Beck may overtop in less severe storm events, although during an 'any year flood event' there is negligible risk to the site.

According to the EA it is considered unlikely that overtopping of the Causeway Dyke will occur. Should an extreme flood event occur, the Causeway Dyke may flood but the flood water should not affect the proposal site.

Should particularly high rainfall intensities take place, surface water ponding may occur in the vicinity of the site. Flood waters would be slow and gradual, surface water ponding would be for a short period and is not seen to be a significant risk to the development.

In review of the EA flood extents the modelled flood 1 in 100yr + climate change level is estimated as 16.94mAOD. To provide future flood risk protection a minimum **FFL of 17.54mAOD** is required, which is 600mm above the predicted flood level.

The site is considered to be at low risk of flooding from the River Trent, which can be mitigated by raising the site levels to the recommended FFL. Flood risk is considered very low from other local watercourses or from local drains and sewers. As the flood risk is managed locally the proposed site should remain safe throughout its lifetime.

4.2 Surface Water and Foul Water Discharge

There are no known surface water drainage systems within the development site itself.

The development proposal includes the construction of a single two storey dwelling with access road, parking and a landscaping.

It is recommended that the surface water discharge from the site be via infiltration structures. Should infiltration systems not be viable for the site following testing, the surface water should be attenuated within the site and discharge at a controlled rate agreed to a local water course. Approval from the local water authority or Environment Agency, dependent on the location of the surface water discharge point may be required under this scenario.

If soakaways are not viable then the surface water may be required to be redirected though third-party land to the Causeway Dyke. Detailed land levels would be required to determine the viability of this option to check a gravity connection is possible.

Any new foul water drainage would be expected to discharge into the nearest public sewer within Boat Lane.

5 CLIMATE CHANGE EFFECT

National Planning Policy Framework (Technical Guidance) (NPPF-TG) Table 5 suggests that a 20% increase in peak river flows will result from climate change in the period to 2115. The predicted water levels within the channel of the River Trent do not appear to exceed the bank levels for this increase in flow based on the information provided. However, the channel does have some remaining freeboard given the predicted water levels.

The rise in water levels marginally increases the risk of a breach or overtopping occurring.

NPPF-TG suggests that a 30% increase in rainfall intensity will result from climate change in the period to 2115. Levels should be fixed so surfaces fall away from buildings or dwellings and any temporary surface water ponding does not pose a risk of flooding adjacent to the other nearby buildings. It is likely that Trent Valley IDB with The EA will continue to monitor the Surface Water drainage network to mitigate any surface water flooding that may occur as a result. Continual improvements to the land drainage systems will be undertaken.

The EA modelled flood levels for a 1 in 1000-year flood event indicate that flood levels would be circa 17.30mAOD, meaning that the proposed FFL would still have 240mm clearance from predicted flood levels. The proposal site will be safe for the expected lifetime of the development.

6 FLOOD RISK MEASURES

The proposed development is deemed to be in the 'More Vulnerable' category of NPPF Table 2. Therefore, flood resilient construction in the lower parts of the dwellings should be considered where appropriate, in accordance with the document "Improving the Flood Performance of New Buildings – Flood Resilient Construction" (ISBN 9781 85946 2874).

Such measures may include: -

- All services to be routed in the ceiling void and brought down walls to terminate at least 0.6m above floor level.
- Water sensitive apparatus such as boilers, water heaters and their controllers, to be mounted at least 1.2m above ground floor level.

- Ground floor construction to be solid concrete slab with floor insulation to be water resistant.
- Wall insulation to be of a closed cell water resistant material up to at least 900mm above ground floor level.
- If brickwork is proposed, then up to at least 0.6m above ground floor level should be of a low porosity (e.g. engineering brick) in order to minimise water absorption.
- Where possible chipboard and Medium Density Fibreboard should be avoided within 900mm of ground floor level.
- Openings in walls are to be minimised below 900mm above floor level.
- The dwelling should be registered on the Environment Agency's Flood Warning scheme.
- The finished floor level (FFL) of the proposed dwellings is to be a **minimum of 17.54mAOD**, 600mm above the predicted flood level 16.94mAOD for a 1 in 100 year +CC event.
- The dwelling should be registered on the Environment Agency's Flood Warning scheme.

The above minimum floor level and construction details will ensure that flood risk at the site arising from the identified sources of flooding is minimized during the lifetime of the dwellings.

7 OFF SITE IMPACTS

7.1 Increase of Flood Risk Elsewhere

The development proposal will increase the impermeable area of the site, although properly managed this will have negligible impact upon areas elsewhere.

As the site is within a large flood zone, the loss of storage from the dwelling will be insignificant and will have negligible overall effect on the flood levels within the flood zone 2, should such an extreme flood event occur.

If soakaways are to be used to manage the water at source, this will minimise the risk of any potential off-site flooding. If soakaways are not viable then consultation is advised concerning an alternative drainage strategy.

7.2 Management of Remaining Risks Over Lifetime of Development

The River Trent has been identified as the highest risk to the development. With the Proposed FFL of **17.54mAOD** this will minimise the risk to the dwelling for the life of the development.

The proposed development should include a drainage design that incorporates Sustainable Drainage Systems (SuDs) where practical. Should infiltration structures not be viable, discharge into a local watercourse should be investigated. Such consideration will serve to reduce impact of the development upon the local area.

In the event of potential flooding of the site during an extreme event the property should be evacuated to safety. A flood evacuation plan has been prepared that will be provided to all occupants of the dwelling. Refer to **Appendix G**.

8 RESIDUAL RISKS

8.1 Remaining Flood Risks After Implementation of Protection measures

It is inevitable that rare and extreme rainfall events will involve volumes of water that exceed the design standard of the surface water drainage which will lead to temporary surface ponding around the site. The final site levels of the proposed dwelling will be fixed so that in extreme conditions surface water flows away from them towards low lying landscaping. This will ensure to reduce the flood risk to the development during extreme rainfall events.

In extreme events it is possible The River Trent may overtop or breach its banks. The topography of the wider surrounding land rises from the River Trent towards the site. This will cause flood water to dissipate over the lower lying areas. The flood water will both spread and rise slowly allowing for warnings to be received and the necessary action taken.

Access to the proposed development will be via Boat Lane and new private driveway. Should flooding of the area surrounding the site occur, access and egress of the site should remain available to allow evacuation from the site should it be necessary. Evacuation should be to Thurgarton Lane and continue to where it intersects with Sailing Club Lane. This is outside the flood zone 2, although if the north side of Thurgarton can be easily reached it is recommended that persons evacuate there.

It is proposed to raise the floor levels above the existing ground level to a **minimum of 17.54mAOD**. The residual risk will be managed for the lifetime of the development as far as practicable for the intended purpose of the development.

Should the access or egress from the site not be possible then refuge is available on the first floor of the proposed dwellings.

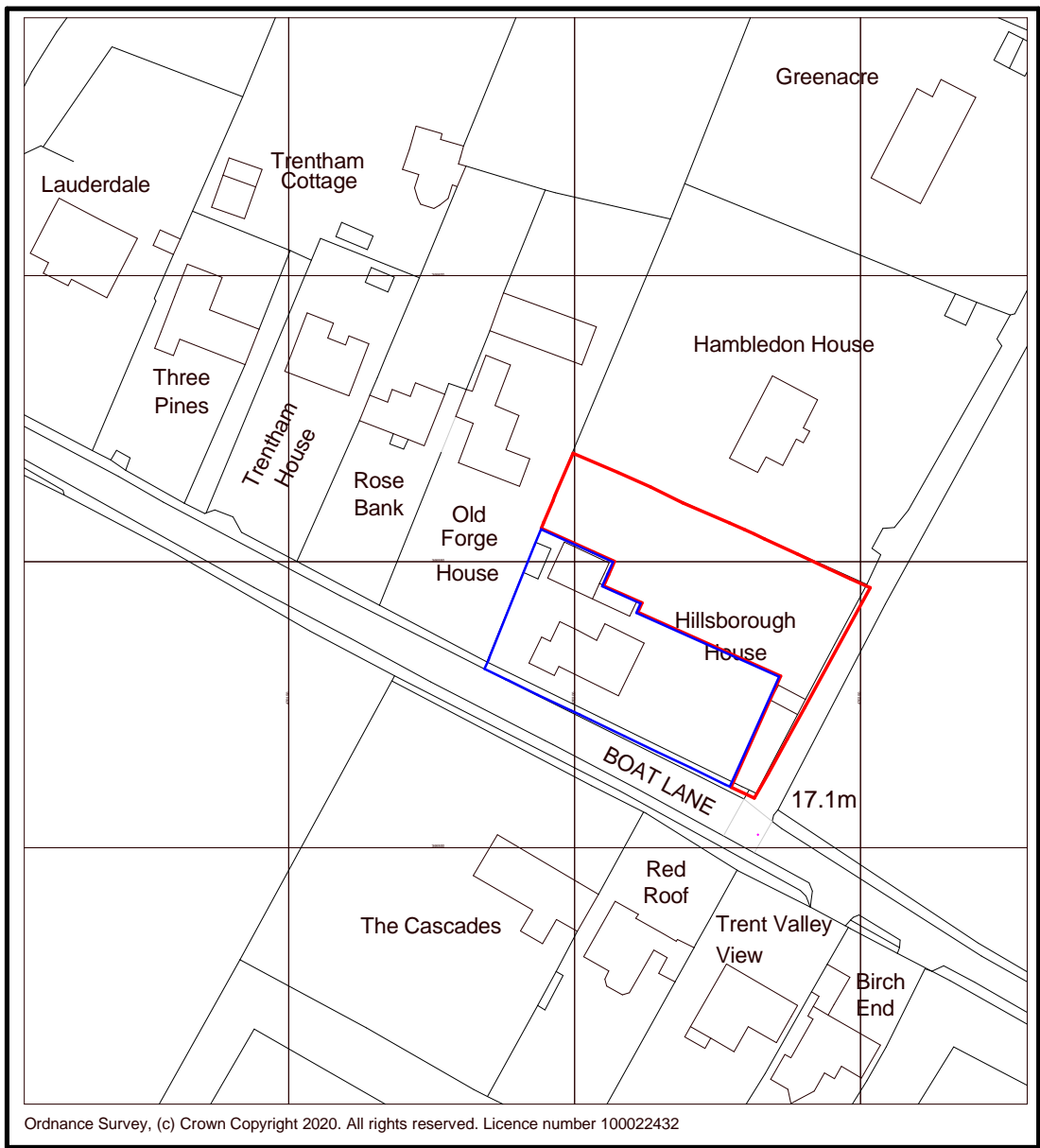
8.2 Management of Remaining Risks Over the Lifetime of Development

The residual risk should be managed by the designers and the construction team for the development, who should ensure that its design and construction incorporates the points and recommendations contained within this assessment.

The development should be registered for automated flood warnings from the Environment Agency as soon as the development is in use.

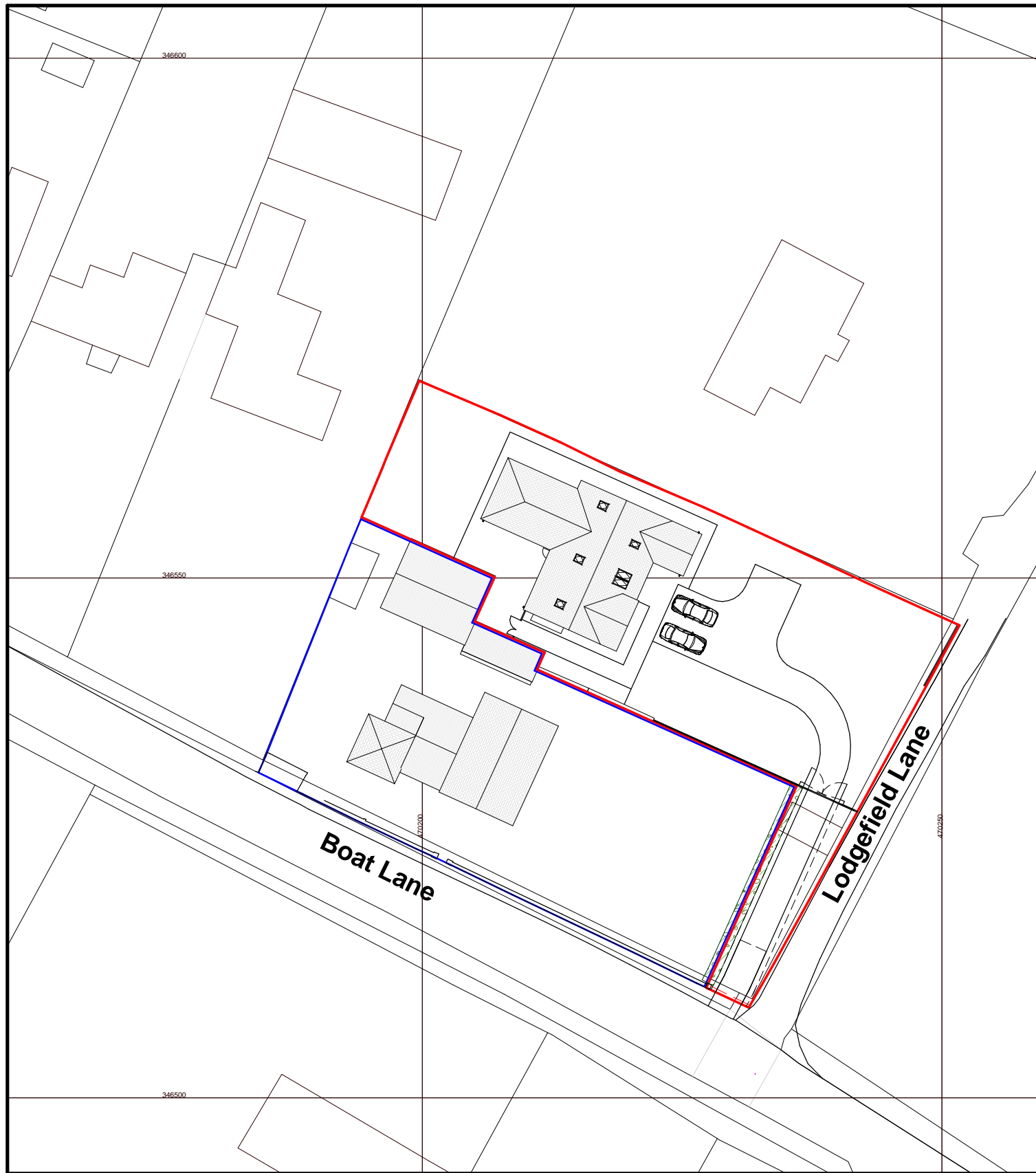
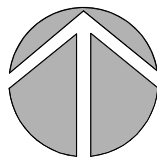
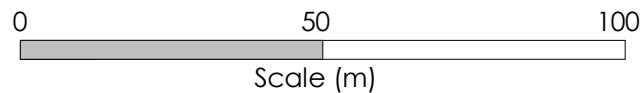
A flood evacuation plan has been prepared that will be provided to all occupants of the dwelling. Refer to **Appendix G**.

APPENDIX A – Site Location



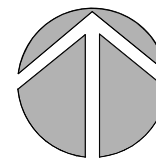
1 Site Location Plan

1 : 1250



2 Site Block Plan

1 : 500



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A3

Original Sheet Size

STATUS
Planning

| rev | date | issued | description |
|-----|----------|--------|----------------------------|
| B | 08.12.20 | JK | Design revisions |
| A | 11.05.20 | JK | Red line boundary adjusted |

PROJECT
New dwelling adjacent to existing house
Hillsborough House
Boat Lane
Hoveringham
NG14 7JP

CLIENT
Mr and Mrs Nind

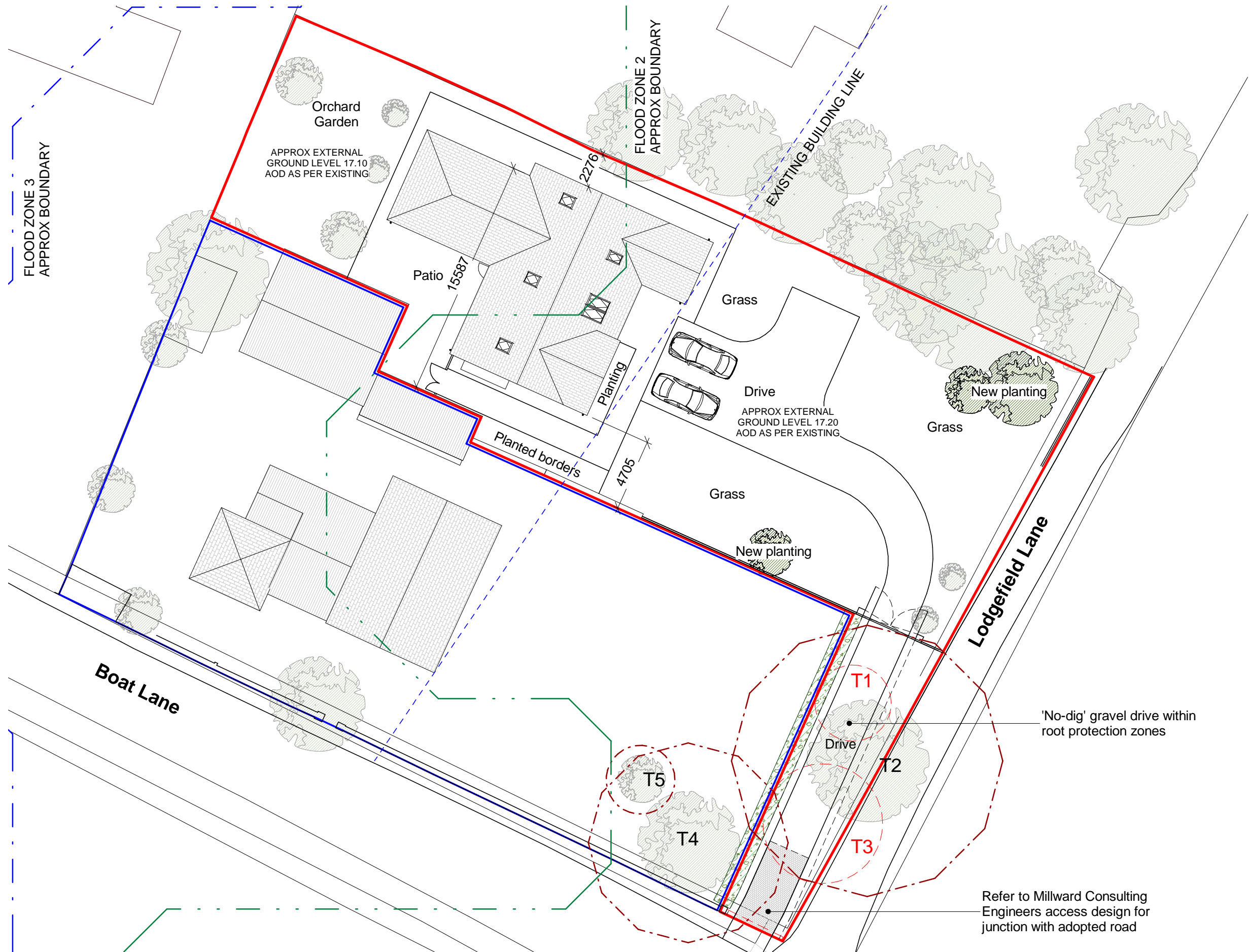
DRAWING
Site Location and Block Plan

| SCALE | DATE | DRAWN | CHK | DRAWING |
|--------------|----------|-------|-----|-----------------|
| As indicated | 03.03.20 | JK | - | 2006-001 |

REV
B

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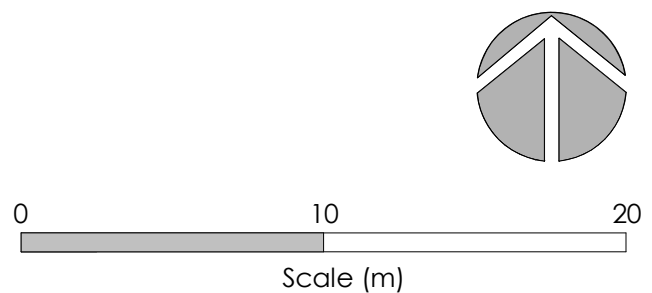
APPENDIX B – Site Plan



Key:

- Existing trees
- Proposed trees
- Root protection zones
- Trees to be removed

Site Area: 1174sqm



Cleveley King Architects

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ARCHITECTS

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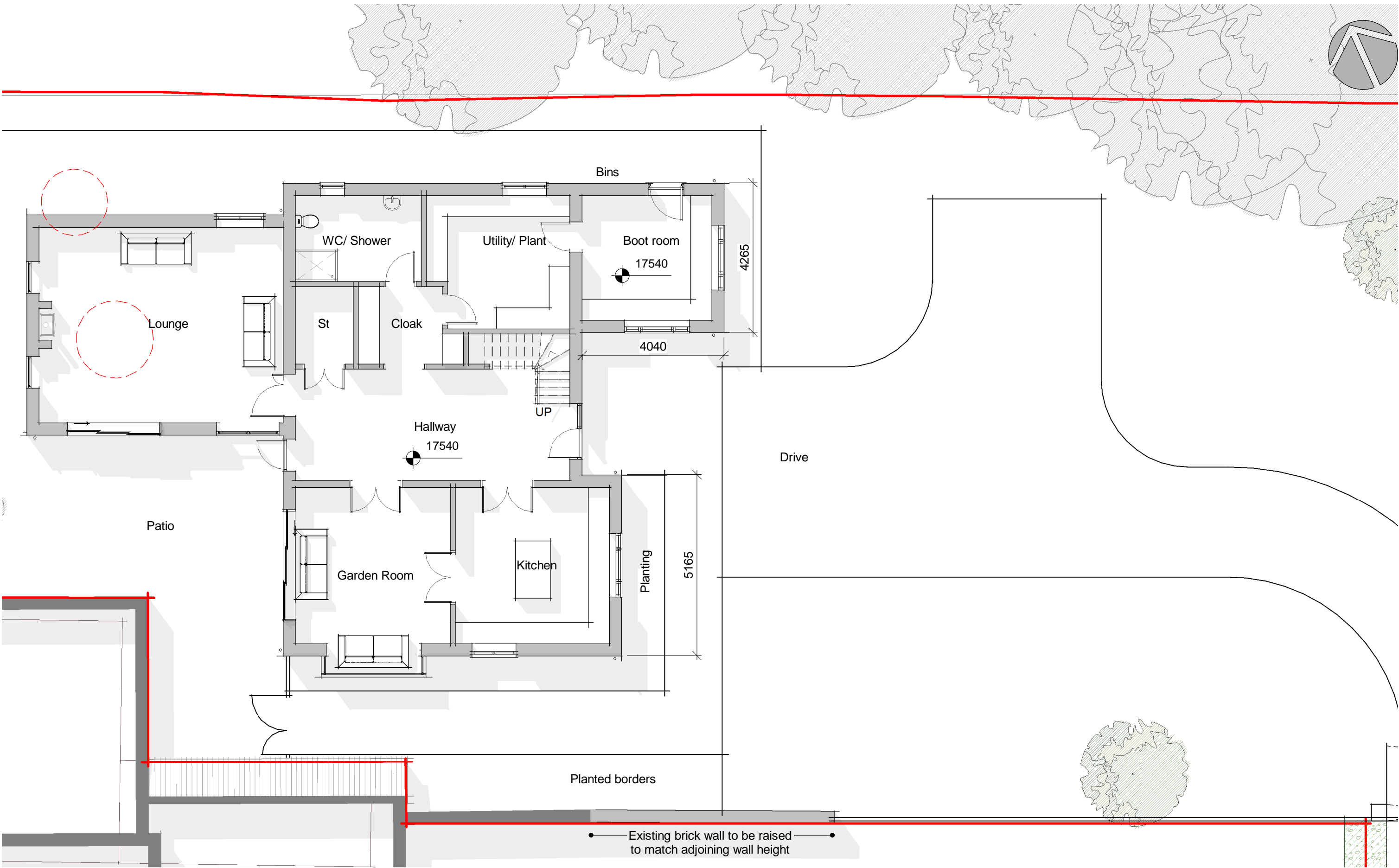
A3
Original Sheet Size
STATUS
Planning

| rev | date | issued | description |
|-----|----------|--------|--|
| C | 08.12.20 | JK | Design revisions |
| B | 23.11.20 | JK | Design revisions to dwelling and site layout |
| A | 26.05.20 | JK | Roof pitch adjusted, eaves height reduced and building moved west 1.5m |

| | | | | | |
|---|------------------|-------------|----------|----------------------------|-----------------|
| PROJECT New dwelling adjacent to existing house Hillsborough House Boat Lane Hoveringham NG14 7JP | | | | CLIENT Mr and Mrs Nind | |
| DRAWING Site Plan | | | | | |
| SCALE As indicated | DATE 03.03.20 | DRAWN JK | CHK - | DRAWING 2006-060 | REV C |

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A3

Original Sheet Size

STATUS
Planning

| rev | date | issued | description |
|-----|----------|--------|--|
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| A | 26.05.20 | JK | Roof pitch adjusted, eaves height reduced and building moved west 1.5m |

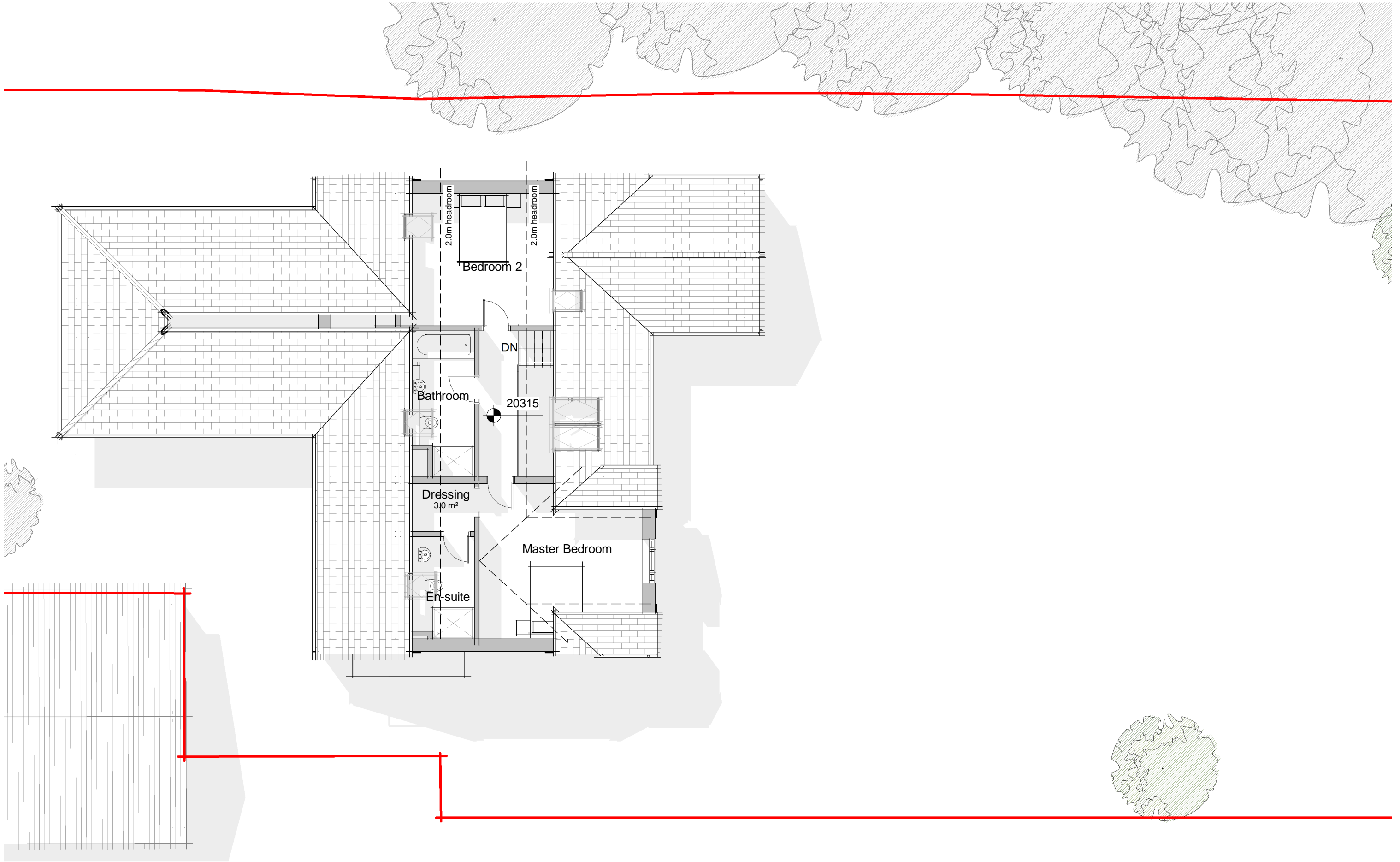
PROJECT
New dwelling adjacent to existing house
Hillsborough House
Boat Lane
Hoveringham
NG14 7JP

CLIENT
Mr and Mrs Nind

DRAWING
Ground Floor Plan

| SCALE | DATE | DRAWN | CHK | DRAWING | REV |
|---------|----------|-------|-----|----------|-----|
| 1 : 100 | 03.03.20 | JK | - | 2006-110 | C |

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A3

Original Sheet Size

STATUS
Planning

| rev | date | issued | description |
|-----|----------|--------|--|
| C | 08.12.20 | JK | Design revisions |
| B | 23.11.20 | JK | Design revisions to dwelling and site layout |
| A | 26.05.20 | JK | Roof pitch adjusted, eaves height reduced and building moved west 1.5m |

PROJECT
New dwelling adjacent to existing house
Hillsborough House
Boat Lane
Hoveringham
NG14 7JP

CLIENT
Mr and Mrs Nind

DRAWING
First Floor Plan

| SCALE | DATE | DRAWN | CHK | DRAWING | REV |
|---------|----------|-------|-----|----------|-----|
| 1 : 100 | 03.03.20 | JK | - | 2006-111 | C |

© COPYRIGHT



East Elevation
1 : 100

Material Key

1. Red brick with engineer brick below DPC
2. Non-interlocking pantile roof
3. Stained timber cladding
4. PPC aluminium/ timber windows/ doors
5. Structurally glazing oriel window bay
6. Flush rooflights
7. Corbelled brick verge/ eaves
8. Half round cast-iron effect uPVC guttering on rise and fall brackets with downpipes
- OB Obscured glass to windows



South Elevation
1 : 100

0 5 10
Scale (m)

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A3

Original Sheet Size

STATUS
Planning

| rev | date | issued | description |
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| C | 08.12.20 | JK | Design revisions |
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PROJECT
New dwelling adjacent to existing house
Hillsborough House
Boat Lane
Hoveringham
NG14 7JP

CLIENT
Mr and Mrs Nind

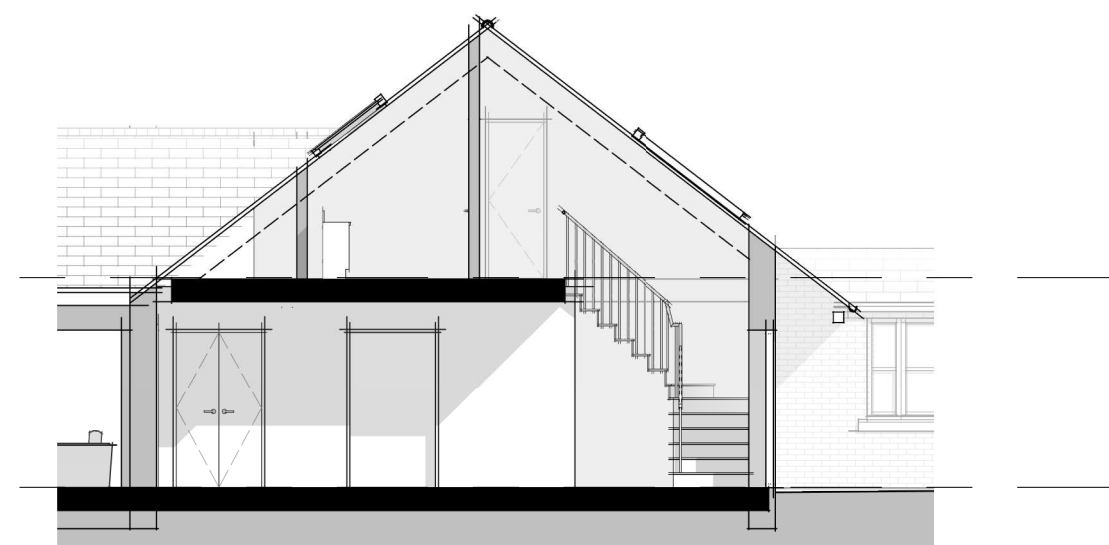
DRAWING
East and South Elevations

| SCALE | DATE | DRAWN | CHK | DRAWING | REV |
|---------|----------|-------|-----|-----------------|----------|
| 1 : 100 | 03.03.20 | JK | - | 2006-210 | C |

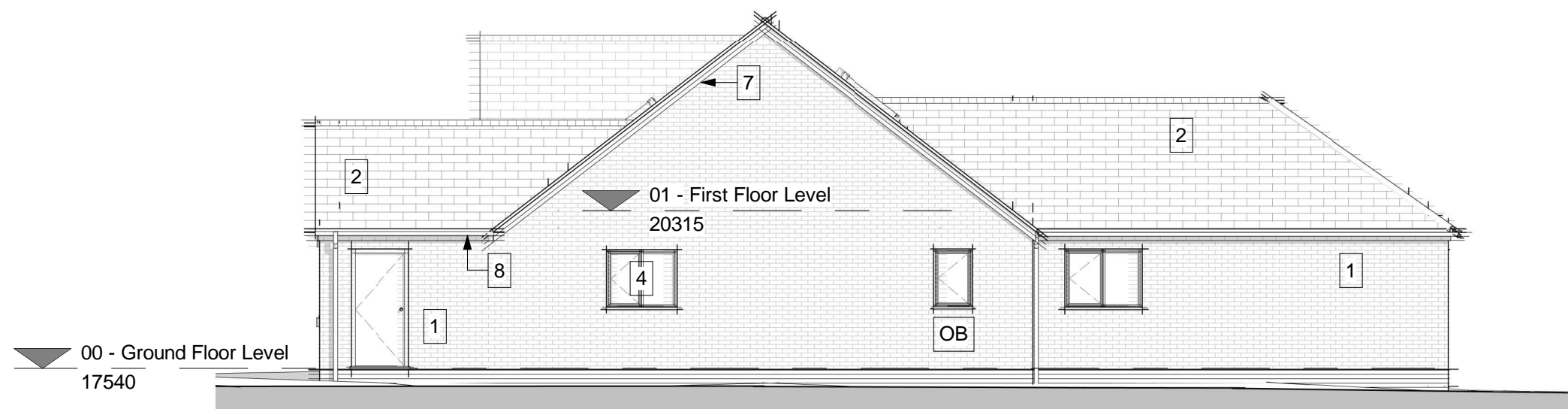
© COPYRIGHT



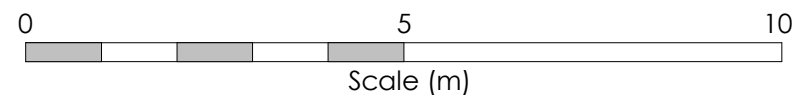
West Elevation
1 : 100



Indicative section through hallway
1 : 100



North Elevation
1 : 100



Material Key

1. Red brick with engineer brick below DPC
2. Non-interlocking pantile roof
3. Stained timber cladding
4. PPC aluminium/ timber windows/ doors
5. Structurally glazing oriel window bay
6. Flush rooflights
7. Corbelled brick verge/ eaves
8. Half round cast-iron effect uPVC guttering on rise and fall brackets with downpipes
- OB Obscured glass to windows

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A3

Original Sheet Size

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| A | 26.05.20 | JK | Roof pitch adjusted, eaves height reduced and building moved west 1.5m |

PROJECT
New dwelling adjacent to existing house
Hillsborough House
Boat Lane
Hoveringham
NG14 7JP

CLIENT
Mr and Mrs Nind

DRAWING
West and North Elevations

| SCALE | DATE | DRAWN | CHK | DRAWING | REV |
|---------|----------|-------|-----|-----------------|----------|
| 1 : 100 | 03.03.20 | JK | - | 2006-211 | C |

APPENDIX C – Existing Site Levels



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A3

Original Sheet Size

STATUS
Planning

| rev | date | issued | description |
|-----|----------|--------|------------------|
| A | 08.12.20 | JK | Design revisions |

PROJECT
New dwelling adjacent to existing house
Hillsborough House
Boat Lane
Hoveringham
NG14 7JP

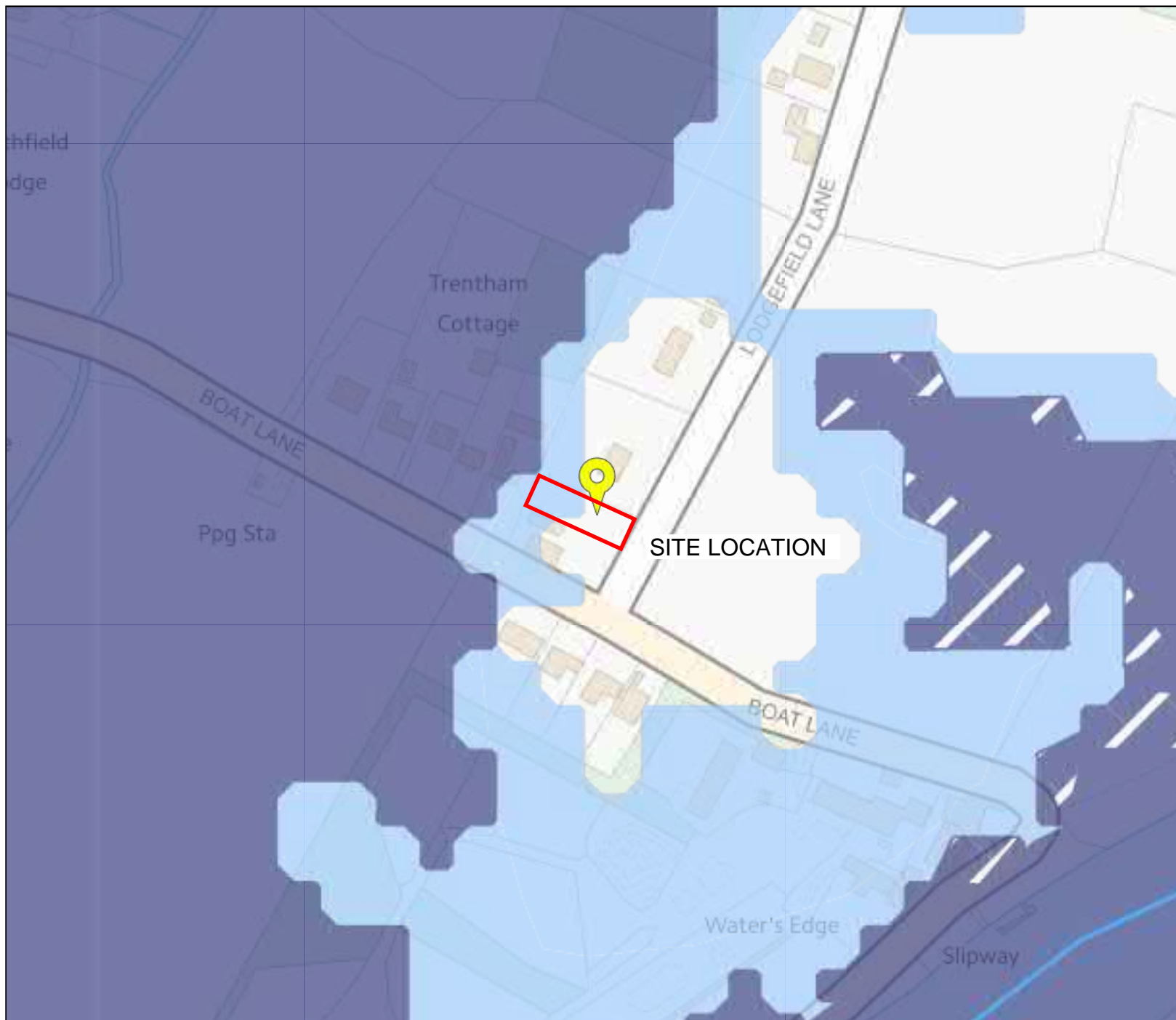
CLIENT
Mr and Mrs Nind

DRAWING
Existing Site Plan

| SCALE | DATE | DRAWN | CHK | DRAWING | REV |
|---------|----------|-------|-----|----------|-----|
| 1 : 250 | 03.03.20 | JK | - | 2006-050 | A |

© COPYRIGHT

APPENDIX D – EA Data I



Flood map for planning

Your reference

Hoveringham

Location (easting/northing)









470227/346550

Scale

1:2500

Created

29 Jan 2020 17:21

-  Selected point
-  Flood zone 3
-  Flood zone 3: areas benefiting from flood defences
-  Flood zone 2
-  Flood zone 1
-  Flood defence
-  Main river
-  Flood storage area

0 20 40 60m

EMD151839

Flood Map for Planning

The Flood Map for Planning is now classed as Open Data. As such it can be downloaded free of charge under an open data licence from the following address: <https://data.gov.uk/publisher/environment-agency>

Alternatively it can be viewed at the following address: <https://flood-map-for-planning.service.gov.uk/>

Modelled Information

The following information, including the modelled extents mapping, has been produced including the effect of any local defences.

| Node point reference | Location | 50% (1 in 2 year) modelled level (mAOD) | 50% (1 in 2 year) modelled flow (m³/s) | 20% (1 in 5 year) modelled level (mAOD) |
|-----------------------------|-----------------|--|--|--|
| DBK_2428 | SK 68464 46393 | 17.98 | 2.88 | 18.06 |
| DBK_2030 | SK 68699 46292 | 17.72 | 2.88 | 17.79 |
| DBK_1829 | SK 68699 46122 | 17.60 | 2.88 | 17.67 |

Source: Nottingham Tributaries SFRM, JBA, January 2014

| Node point reference | Location | 20% (1 in 5 year) modelled flow (m³/s) | 10% (1 in 10 year) modelled level (mAOD) | 10% (1 in 10 year) modelled flow (m³/s) |
|----------------------|----------------|--|--|---|
| DBK_2428 | SK 68464 46393 | 3.48 | 18.07 | 3.67 |
| DBK_2030 | SK 68699 46292 | 3.27 | 17.80 | 3.31 |
| DBK_1829 | SK 68699 46122 | 3.27 | 17.68 | 3.31 |

Source: Nottingham Tributaries SFRM, JBA, January 2014

| Node point reference | Location | 5% (1 in 20 year) modelled level (mAOD) | 5% (1 in 20 year) modelled flow (m³/s) | 2% (1 in 50 year) modelled level (mAOD) |
|----------------------|----------------|---|--|---|
| DBK_2428 | SK 68464 46393 | 18.07 | 3.71 | 18.07 |
| DBK_2030 | SK 68699 46292 | 17.80 | 3.31 | 17.80 |
| DBK_1829 | SK 68699 46122 | 17.68 | 3.31 | 17.68 |

Source: Nottingham Tributaries SFRM, JBA, January 2014

| Node point reference | Location | 2% (1 in 50 year) modelled flow (m ³ /s) | 1.33% (1 in 75 year) modelled level (mAOD) | 1.33% (1 in 75 year) modelled flow (m ³ /s) |
|----------------------|----------------|---|--|--|
| DBK_2428 | SK 68464 46393 | 3.73 | 18.07 | 3.73 |
| DBK_2030 | SK 68699 46292 | 3.32 | 17.80 | 3.32 |
| DBK_1829 | SK 68699 46122 | 3.31 | 17.68 | 3.32 |

Source: Nottingham Tributaries SFRM, JBA, January 2014

| Node point reference | Location | 1% (1 in 100 year) modelled level (mAOD) | 1% (1 in 100 year) modelled flow (m ³ /s) | 0.5% (1 in 200 year) modelled level (mAOD) |
|----------------------|----------------|--|--|--|
| DBK_2428 | SK 68464 46393 | 18.07 | 3.74 | 18.07 |
| DBK_2030 | SK 68699 46292 | 17.80 | 3.32 | 17.80 |
| DBK_1829 | SK 68699 46122 | 17.68 | 3.32 | 17.68 |

Source: Nottingham Tributaries SFRM, JBA, January 2014

| Node point reference | Location | 0.5% (1 in 200 year) modelled flow (m³/s) | 0.1% (1 in 1000 year) modelled level (mAOD) | 0.1% (1 in 1000 year) modelled flow (m³/s) |
|-----------------------------|-----------------|--|--|---|
| DBK_2428 | SK 68464 46393 | 3.75 | 18.07 | 3.80 |
| DBK_2030 | SK 68699 46292 | 3.35 | 17.80 | 3.38 |
| DBK_1829 | SK 68699 46122 | 3.35 | 17.68 | 3.37 |

Source: Nottingham Tributaries SFRM, JBA, January 2014

| Node point reference | Location | 1% + 20% flow (1 in 100 year plus climate change) modelled level (mAOD) | 1% + 20% flow (1 in 100 year plus climate change) modelled flow (m³/s) |
|-----------------------------|-----------------|--|---|
| DBK_2428 | SK 68464 46393 | 18.07 | 3.75 |
| DBK_2030 | SK 68699 46292 | 17.80 | 3.35 |
| DBK_1829 | SK 68699 46122 | 17.68 | 3.35 |

Source: Nottingham Tributaries SFRM, JBA, January 2014

The following information, including the modelled extents mapping, has been produced including the effect of any local defences.

| Node point reference | Location | 20% (1 in 5 year) modelled level (mAOD) | 20% (1 in 5 year) modelled flow (m³/s) | 10% (1 in 10 year) modelled level (mAOD) |
|-----------------------------|-----------------|--|---|---|
| 403556380 | SK 71217 46736 | 15.76 | 617.99 | 15.94 |
| 403556880 | SK 70782 46458 | 15.93 | 596.68 | 16.12 |
| 403557620 | SK 70178 46110 | 16.14 | 589.72 | 16.33 |

Source: Trent and Tributaries at Newark SFRM2, Halcrow, July 2011

| Node point reference | Location | 10% (1 in 10 year) modelled flow (m³/s) | 5% (1 in 20 year) modelled level (mAOD) | 5% (1 in 20 year) modelled flow (m³/s) |
|-----------------------------|-----------------|--|--|---|
| 403556380 | SK 71217 46736 | 669.32 | 16.07 | 729.09 |
| 403556880 | SK 70782 46458 | 644.27 | 16.26 | 704.32 |
| 403557620 | SK 70178 46110 | 623.51 | 16.48 | 675.04 |

Source: Trent and Tributaries at Newark SFRM2, Halcrow, July 2011

| Node point reference | Location | 2% (1 in 50 year) modelled level (mAOD) | 2% (1 in 50 year) modelled flow (m³/s) | 1.33% (1 in 75 year) modelled level (mAOD) |
|-----------------------------|-----------------|--|--|---|
| 403556380 | SK 71217 46736 | 16.21 | 794.64 | 16.26 |
| 403556880 | SK 70782 46458 | 16.41 | 786.42 | 16.47 |
| 403557620 | SK 70178 46110 | 16.66 | 746.04 | 16.74 |

Source: Trent and Tributaries at Newark SFRM2, Halcrow, July 2011

| Node point reference | Location | 1.33% (1 in 75 year) modelled flow (m³/s) | 1% (1 in 100 year) modelled level (mAOD) | 1% (1 in 100 year) modelled flow (m³/s) |
|-----------------------------|-----------------|---|---|---|
| 403556380 | SK 71217 46736 | 822.94 | 16.33 | 855.79 |
| 403556880 | SK 70782 46458 | 820.19 | 16.54 | 862.68 |
| 403557620 | SK 70178 46110 | 775.08 | 16.82 | 808.44 |

Source: Trent and Tributaries at Newark SFRM2, Halcrow, July 2011

| Node point reference | Location | 0.5% (1 in 200 year) modelled level (mAOD) | 0.5% (1 in 200 year) modelled flow (m³/s) | 0.1% (1 in 1000 year) modelled level (mAOD) |
|----------------------|----------------|--|---|---|
| 403556380 | SK 71217 46736 | 16.43 | 895.66 | 16.90 |
| 403556880 | SK 70782 46458 | 16.63 | 917.13 | 17.04 |
| 403557620 | SK 70178 46110 | 16.94 | 852.32 | 17.41 |

Source: Trent and Tributaries at Newark SFRM2, Halcrow, July 2011

| Node point reference | Location | 0.1% (1 in 1000 year) modelled flow (m³/s) | 1% + 20% flow (1 in 100 year plus climate change) modelled level (mAOD) | 1% + 20% flow (1 in 100 year plus climate change) modelled flow (m³/s) |
|----------------------|----------------|--|---|--|
| 403556380 | SK 71217 46736 | 1,019.86 | 16.54 | 930.99 |
| 403556880 | SK 70782 46458 | 1,126.74 | 16.73 | 973.30 |
| 403557620 | SK 70178 46110 | 1,044.73 | 17.05 | 900.28 |

Source: Trent and Tributaries at Newark SFRM2, Halcrow, July 2011

Please note: The flows provided represent **in channel flow only** and do not take into account flow on the floodplain.

Updated Climate Change Guidance

On 19th February 2016, the [Flood risk assessments: climate change allowances](#) was published on www.gov.uk website. It has replaced previous guidance [Climate Change Allowances for Planners](#).

The climate change guidance can be found at: <https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances>
If your RFI is to assist with a Flood Risk Assessment (FRA) for a future planning application, please review this guidance to consider which allowances should be used for your site.

Defence Information

There are no Environment Agency maintained raised defences in this area.

Historic Information

We have records of historic fluvial flooding at this location in 1947, 1977 and 2000. Please note that we may or may not hold the original records in question. We do not make any claim as to the reliability of recorded flood extents or that all flood events in the area have been recorded. Please also be aware that flood defences may have been built subsequent to these historic flood events. Note - This information relates to the area the above named property is in, and is not specific to the property itself - it **does not** provide an indicator of flood risk **at individual property level**.

Open Data Information

The below datasets are now classed as Open Data and as such can be downloaded free of charge under an open data licence from the following address: <https://data.gov.uk/publisher/environment-agency>

- Risk of Flooding from Rivers and Sea (RoFRS) data
- LiDAR Data
- Flood Map for Planning (Rivers and Sea)
- Historic Flooding Data

Permitting Information

Under the Environmental Permitting (England and Wales) Regulations 2016, any permanent or temporary works in, over or under a designated main river will require an Environmental Permit for Flood Risk Activities from the Environment Agency.

Any permanent or temporary works within 8 metres of the top of bank of a designated main river, or landward toe of a flood defence may require an Environmental Permit for Flood Risk Activities from the Environment Agency. In addition, any permanent or temporary works within the floodplain of a designated main river may also require an Environmental Permit for Flood Risk Activities.

To find out whether your activity requires a permit or falls under a relevant exclusion, exemption or standard rule please follow the link below:

<https://www.gov.uk/guidance/flood-risk-activities-environmental-permits>

Please note that a permit is separate to and in addition to any planning permission granted.

Product Information

Below is a brief overview of which Product is likely to be most appropriate for your needs. This information will only be provided where it is available as we do not hold detailed information on all watercourses.

Product 4 – Producing a Flood Risk Assessment (FRA) where you:

- Require mapped and tabulated outputs from an Environment Agency model *e.g flood levels for a range of events*
- Require information on local defences and historic flooding events
- Do not need to undertake additional hydraulic modelling

Product 6 – Producing a Flood Risk Assessment (FRA) where you:

- Require raw modelling results files
- Require modelling results in GIS format

Product 7 - Producing a Flood Risk Assessment (FRA) where you:

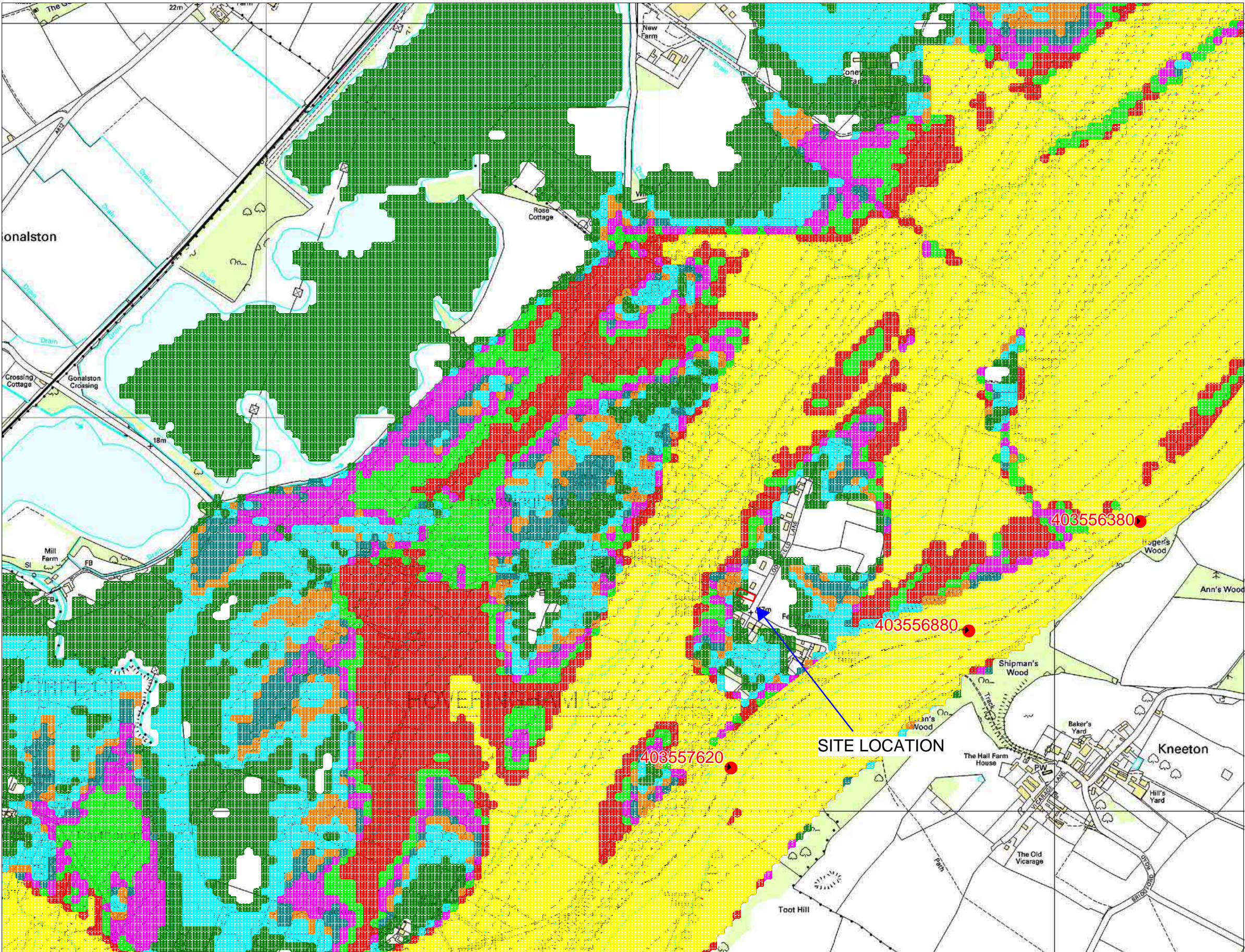
- Do need to undertake additional hydraulic modelling using an existing Environment Agency model

In most instances to supply Product 6 and Product 7 data a hard drive will need to be supplied due to the large file sizes associated with this information. Please note that this information will require specialist modelling software to view and run.

A Product 5 (Model Report) will be supplied with all Product 6 and 7 requests and can also be requested separately.

APPENDIX D – EA Data II – Trent Flood Maps

**Modelled Extents Map centred on Boundary House, Hoveringham -
created 29 November 2019 Ref: [EMD152062]**



Legend

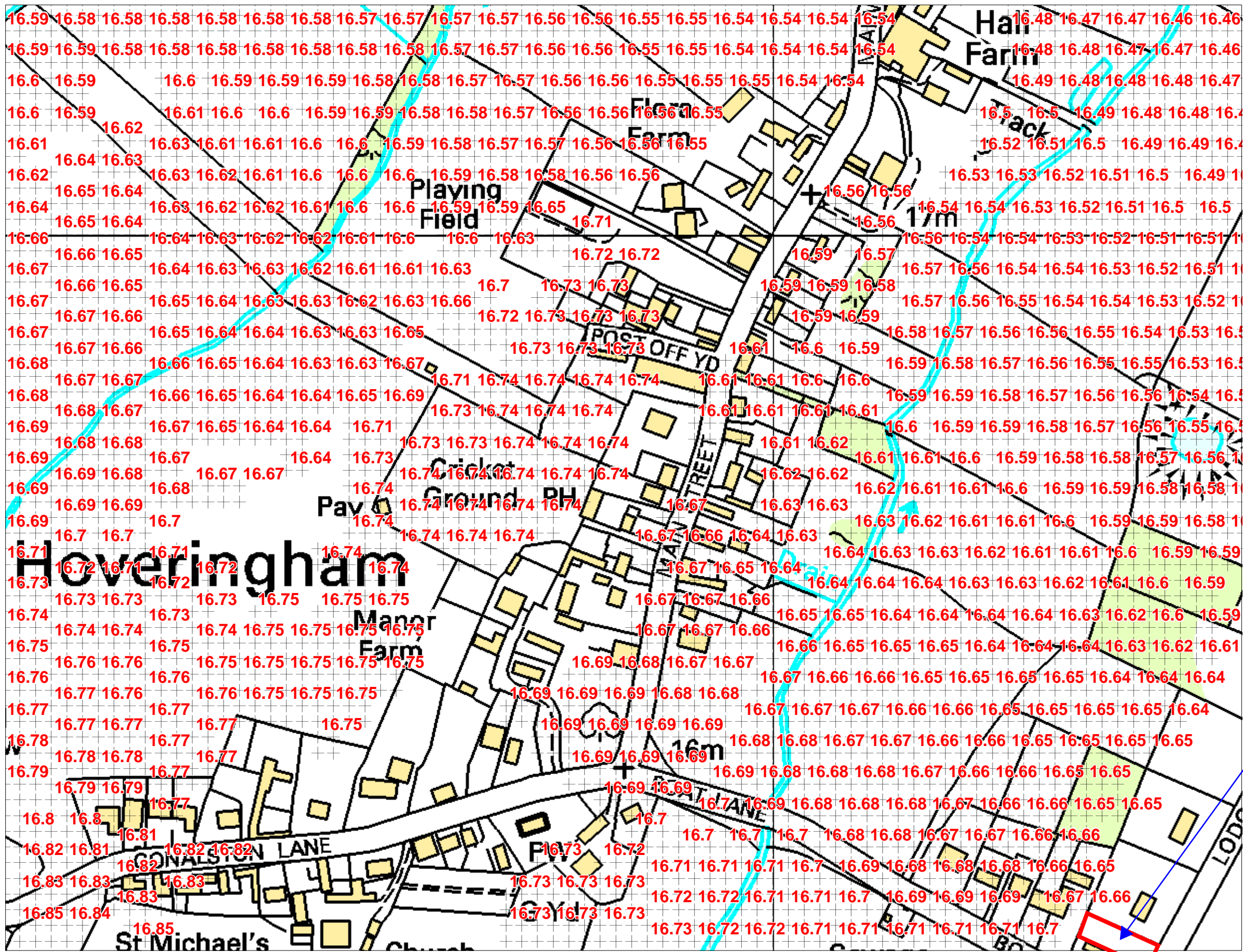
- 1 in 5 year Modelled Extent
- 1 in 10 year Modelled Extent
- 1 in 20 year Modelled Extent
- 1 in 50 year Modelled Extent
- 1 in 75 year Modelled Extent
- 1 in 100 year Modelled Extent
- 1 in 100 year Modelled Extent (including climate change forecast)
- 1 in 200 year Modelled Extent
- 1 in 1000 year Modelled Extent

Modelled Node Location and Reference

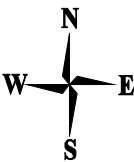
Source:
Trent and Tributaries at Newark SFRM2,
Halcrow, July 2011

A Strategic Flood Risk Assessment may be available, providing further information for this site. Please contact your Local Planning Authority to access this information as it will need to be considered within any Flood Risk Assessment submission.

Floodplain Heights Map centred on Boundary House, Hoveringham - created 29 November 2019 Ref: [EMD152062]



Scale 1:2500



Legend

x.xx

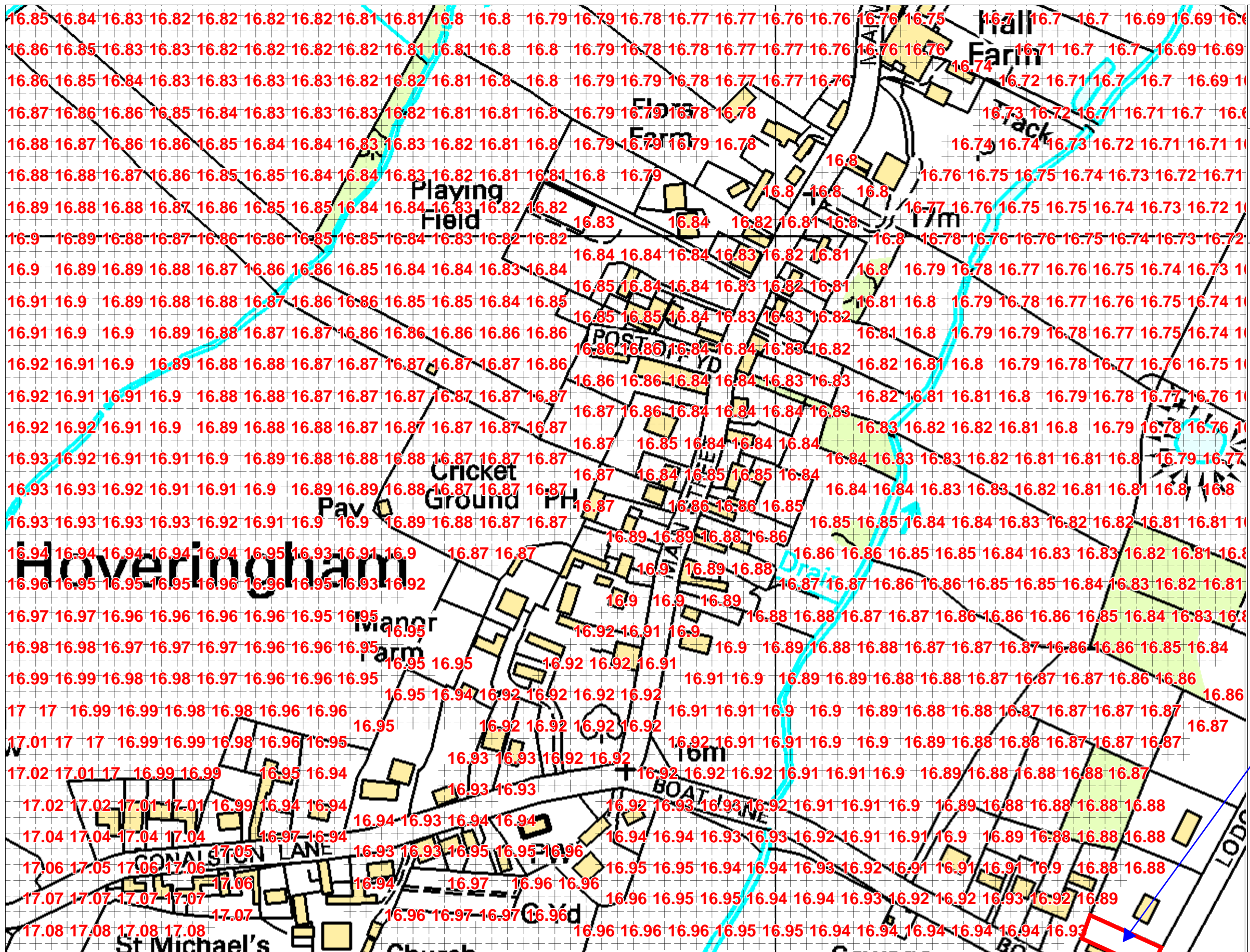
1 in 100 year
Floodplain Level (mAOD)

Source:
Trent and Tributaries at Newark SFRM2,
Halcrow, July 2011

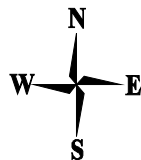
SITE LOCATION

A Strategic Flood Risk Assessment may be available, providing further information for this site. Please contact your Local Planning Authority to access this information as it will need to be considered within any Flood Risk Assessment submission.

Floodplain Heights Map centred on Boundary House, Hoveringham - created 29 November 2019 Ref: [EMD152062]



Scale 1:2500



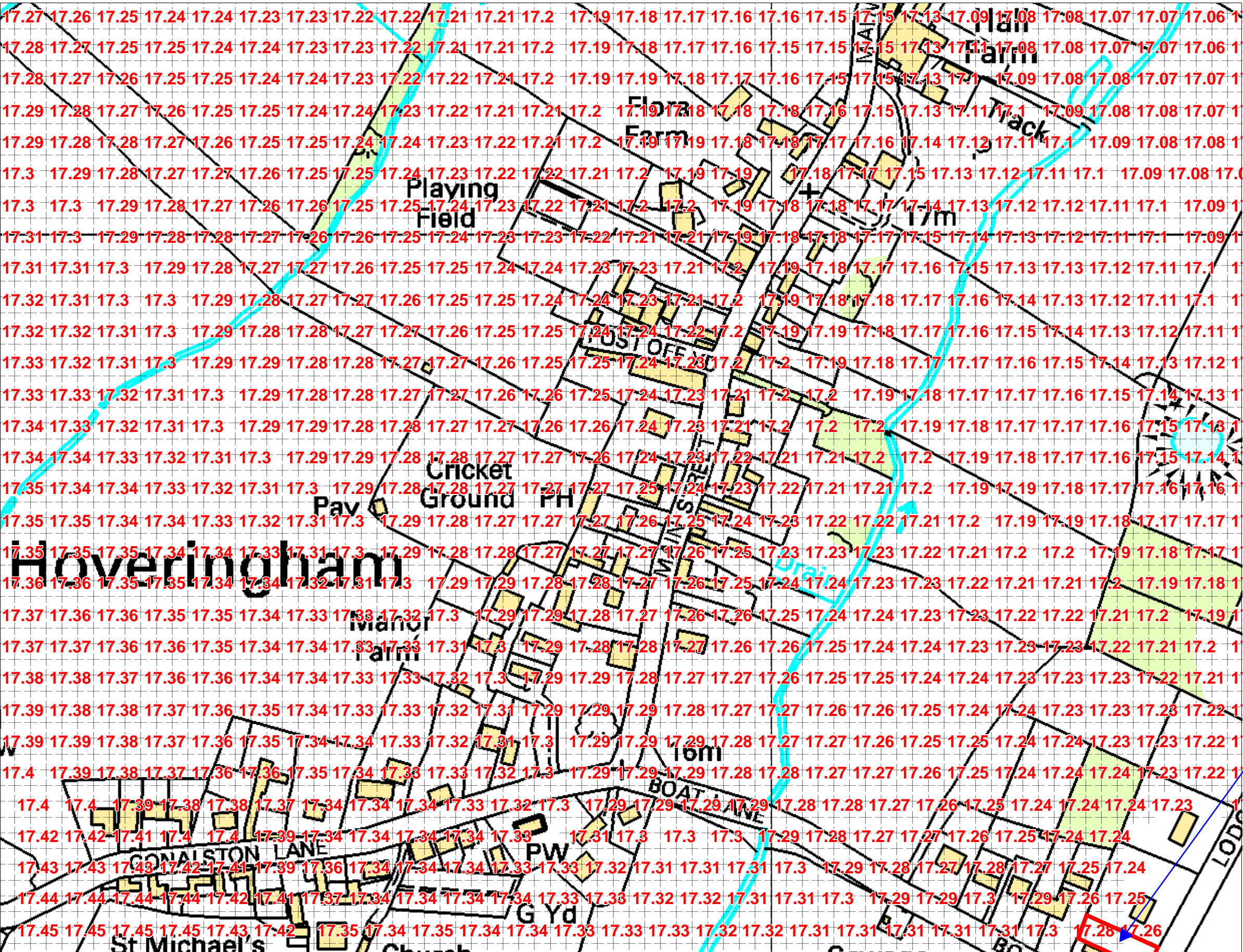
Legend

- x.xx
+ 1 in 100 year
Floodplain Level (mAOD)
(plus climate change forecast)
- Source:
Trent and Tributaries at Newark SFRM2,
Halcrow, July 2011

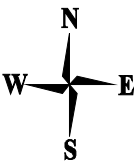
SITE LOCATION

A Strategic Flood Risk Assessment may be available, providing further information for this site. Please contact your Local Planning Authority to access this information as it will need to be considered within any Flood Risk Assessment submission.

Floodplain Heights Map centred on Boundary House, Hoveringham - created 29 November 2019 Ref: [EMD152062]



Scale 1:2500



Legend

x.xx

1 in 1000 year
Floodplain Level (mAOD)

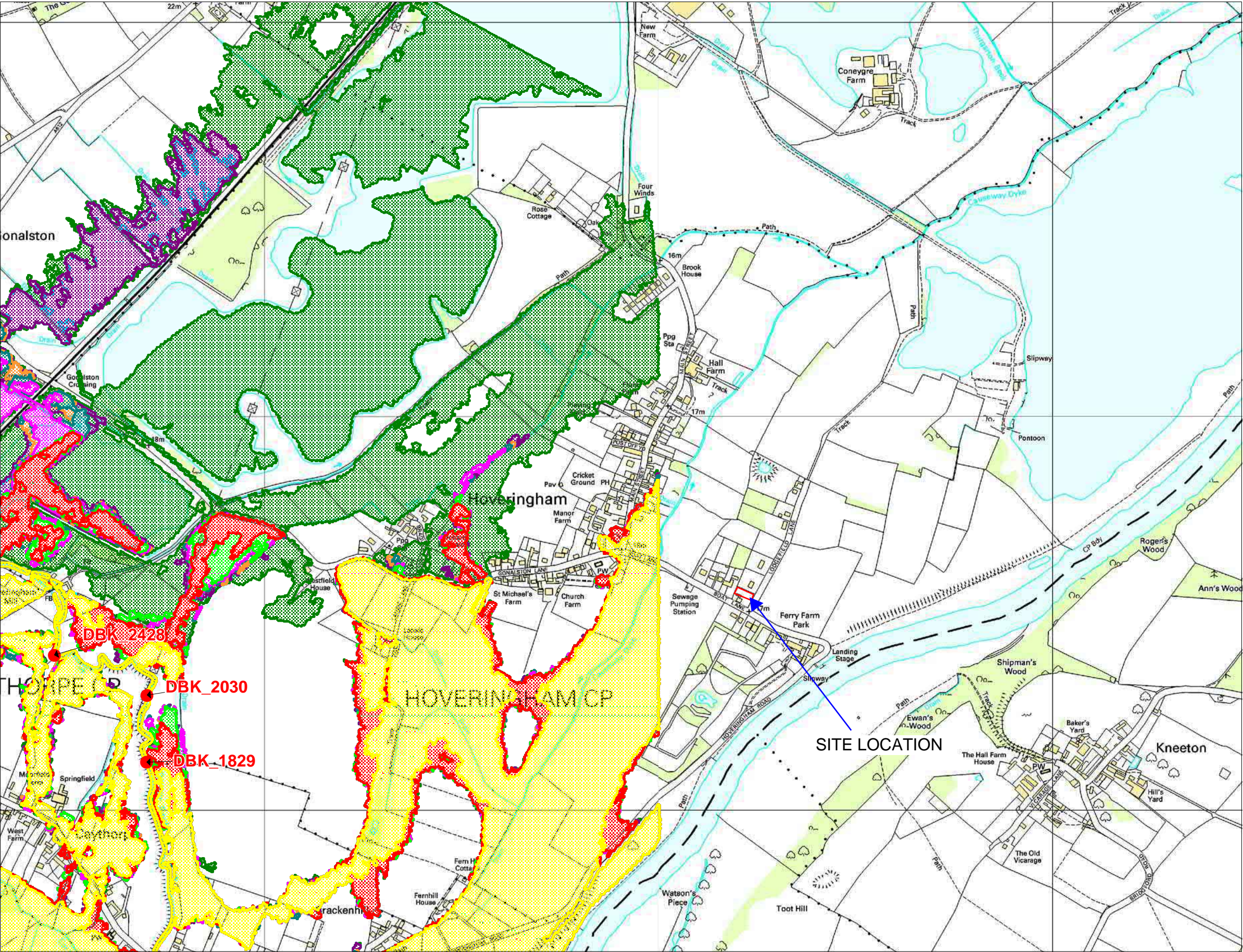
Source:
Trent and Tributaries at Newark SFRM2,
Halcrow, July 2011

SITE LOCATION

A Strategic Flood Risk Assessment may be available, providing further information for this site. Please contact your Local Planning Authority to access this information as it will need to be considered within any Flood Risk Assessment submission.

APPENDIX D – EA Data III – Dover Beck Flood Maps

Modelled Extents Map centred on Boundary House, Hoveringham - created 29 November 2019 Ref: [EMD152062]



Legend

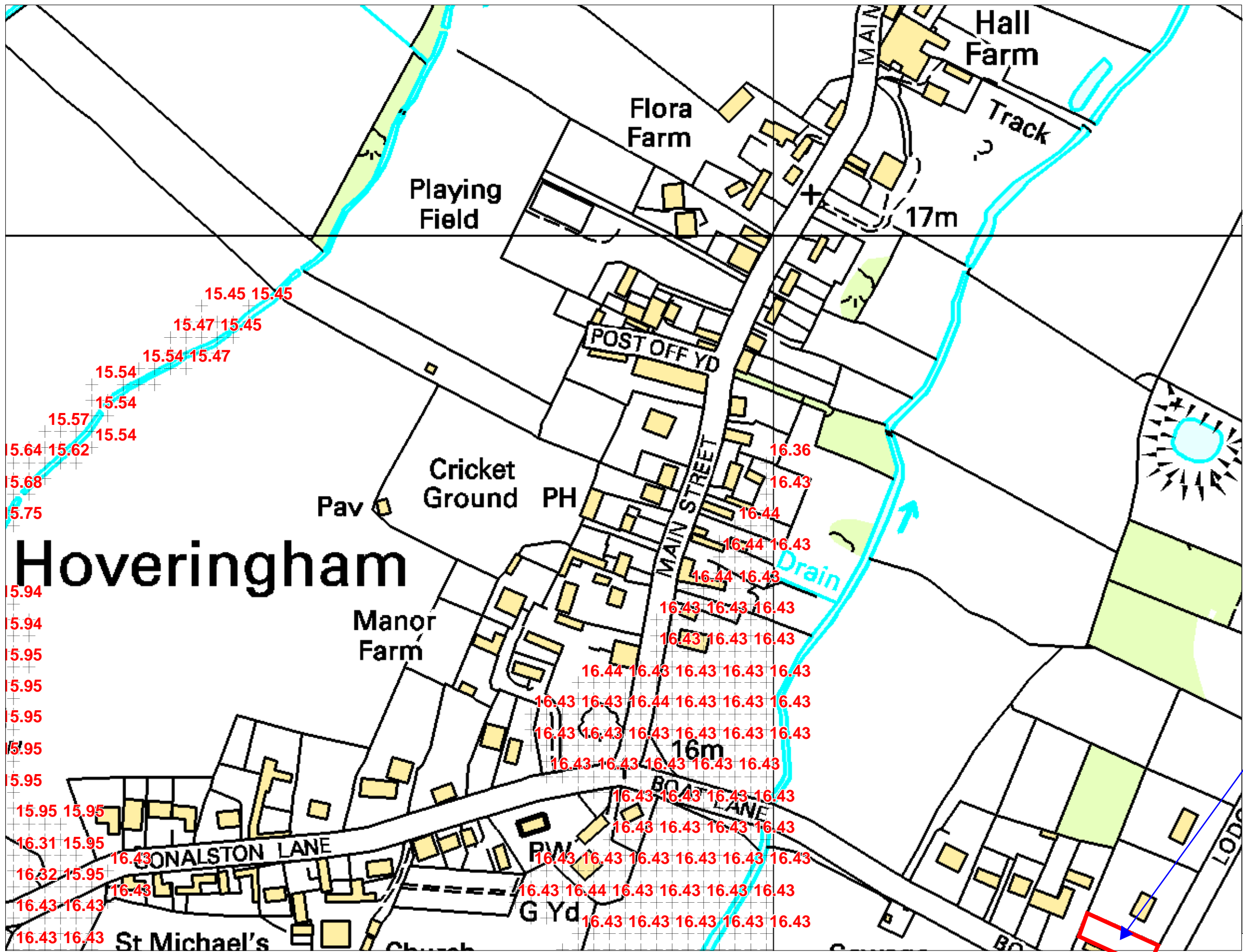
-  1 in 5 year Modelled Extent
-  1 in 10 year Modelled Extent
-  1 in 20 year Modelled Extent
-  1 in 50 year Modelled Extent
-  1 in 75 year Modelled Extent
-  1 in 100 year Modelled Extent
-  1 in 100 year Modelled Extent (including climate change forecast)
-  1 in 200 year Modelled Extent
-  1 in 1000 year Modelled Extent

 Modelled Node Location and Reference

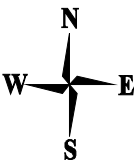
Source:
Nottingham Tributaries SFRM,
JBA, January 2014

A Strategic Flood Risk Assessment may be available, providing further information for this site. Please contact your Local Planning Authority to access this information as it will need to be considered within any Flood Risk Assessment submission.

Floodpain Heights Map centred on Boundary House, Hoveringham -
created 29 November 2019 Ref: [EMD152062]



Scale 1:2500



Legend

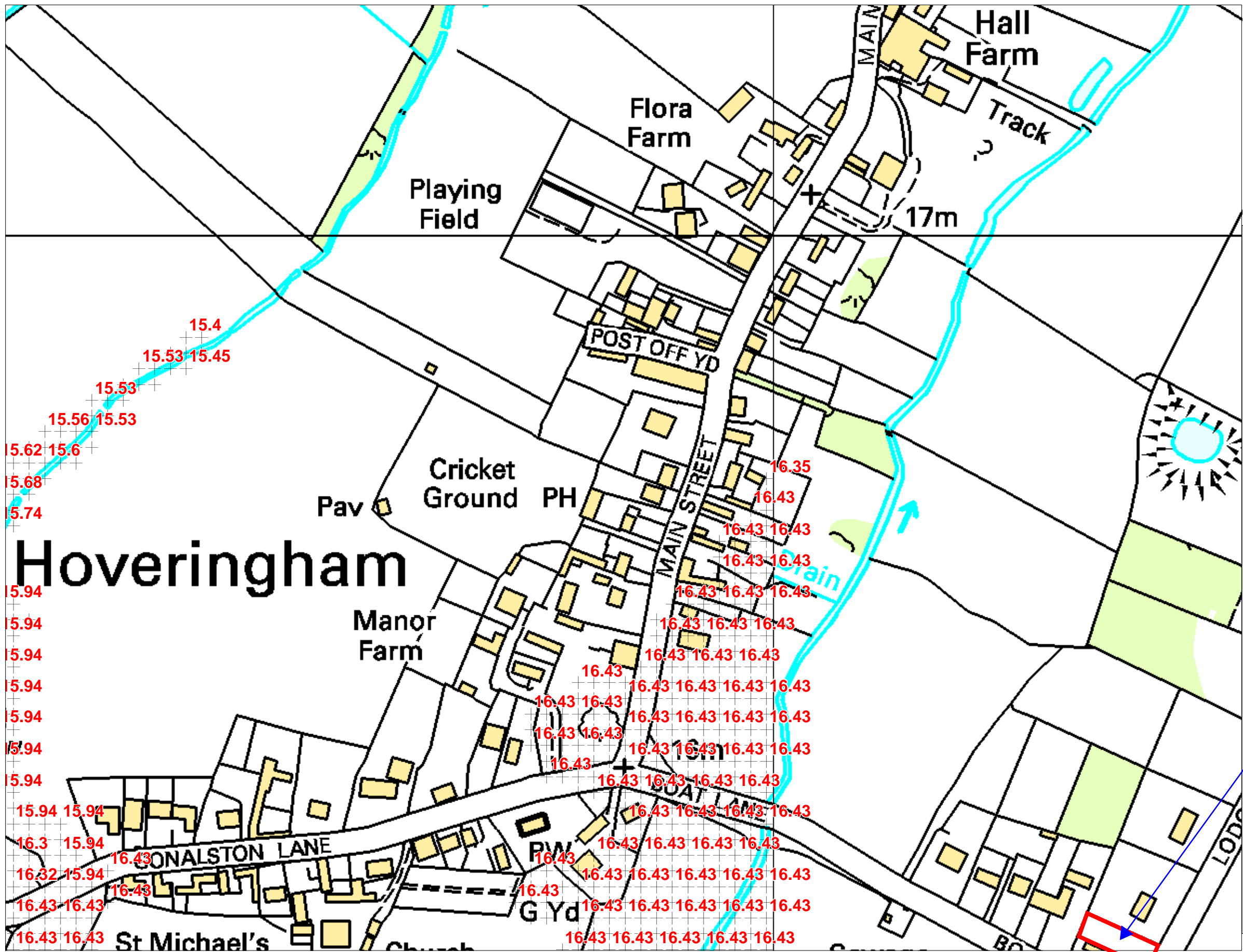
x.xx
+
1 in 100 year
Floodplain Level (mAOD)
(plus climate change forecast)

Source:
Nottingham Tributaries SFRM, JBA,
January 2014

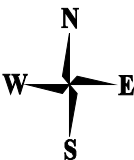
SITE LOCATION

A Strategic Flood Risk Assessment may be available, providing further information for this site. Please contact your Local Planning Authority to access this information as it will need to be considered within any Flood Risk Assessment submission.

Floodpain Heights Map centred on Boundary House, Hoveringham -
created 29 November 2019 Ref: [EMD152062]



Scale 1:2500



Legend

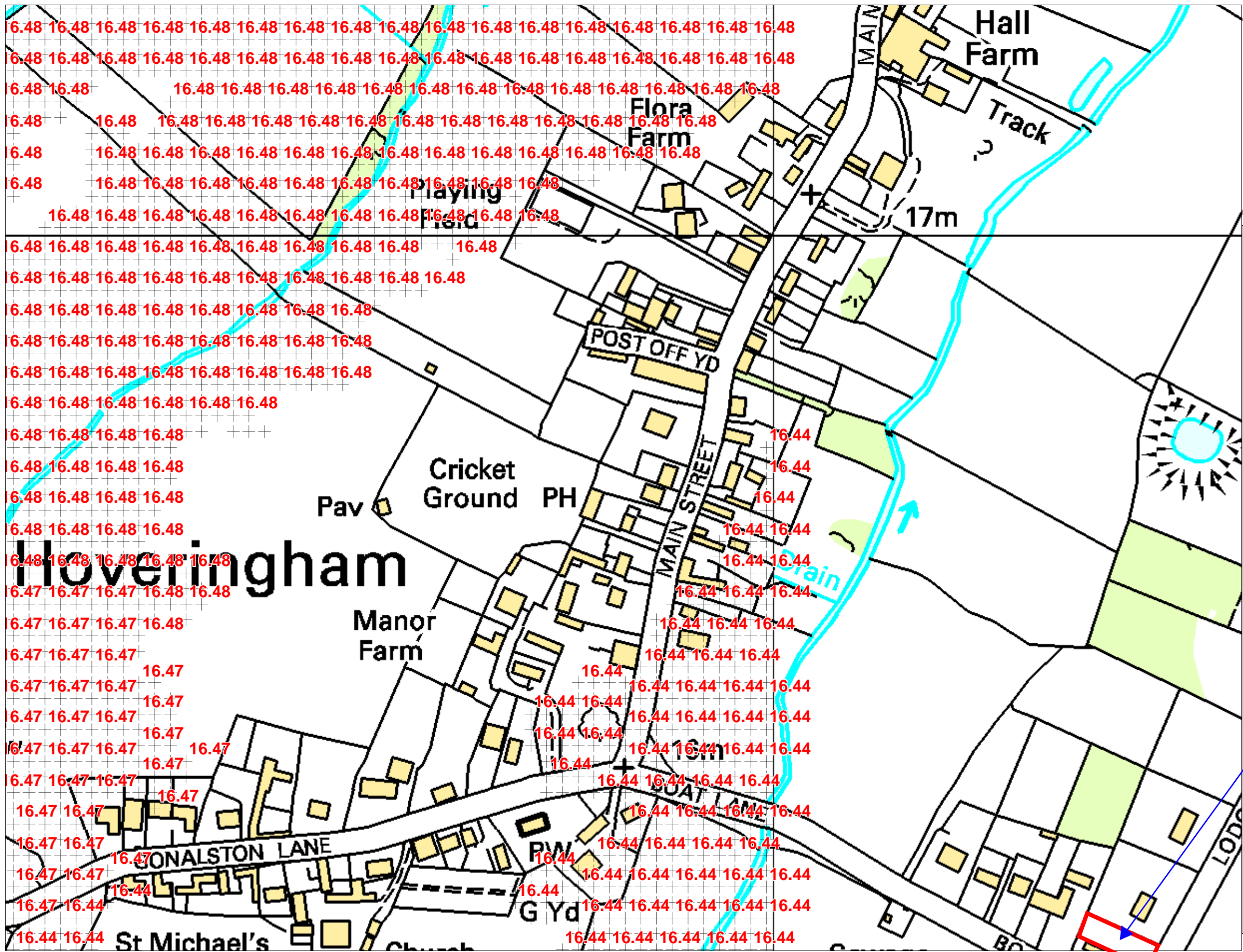
x.xx
+
1 in 100 year
Floodplain Level (mAOD)

Source:
Nottingham Tributaries SFRM, JBA,
January 2014

SITE LOCATION

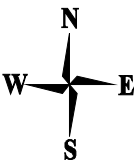
A Strategic Flood Risk Assessment may be available, providing further information for this site. Please contact your Local Planning Authority to access this information as it will need to be considered within any Flood Risk Assessment submission.

Floodpain Heights Map centred on Boundary House, Hoveringham -
created 29 November 2019 Ref: [EMD152062]



No Window

Scale 1:2500



Legend

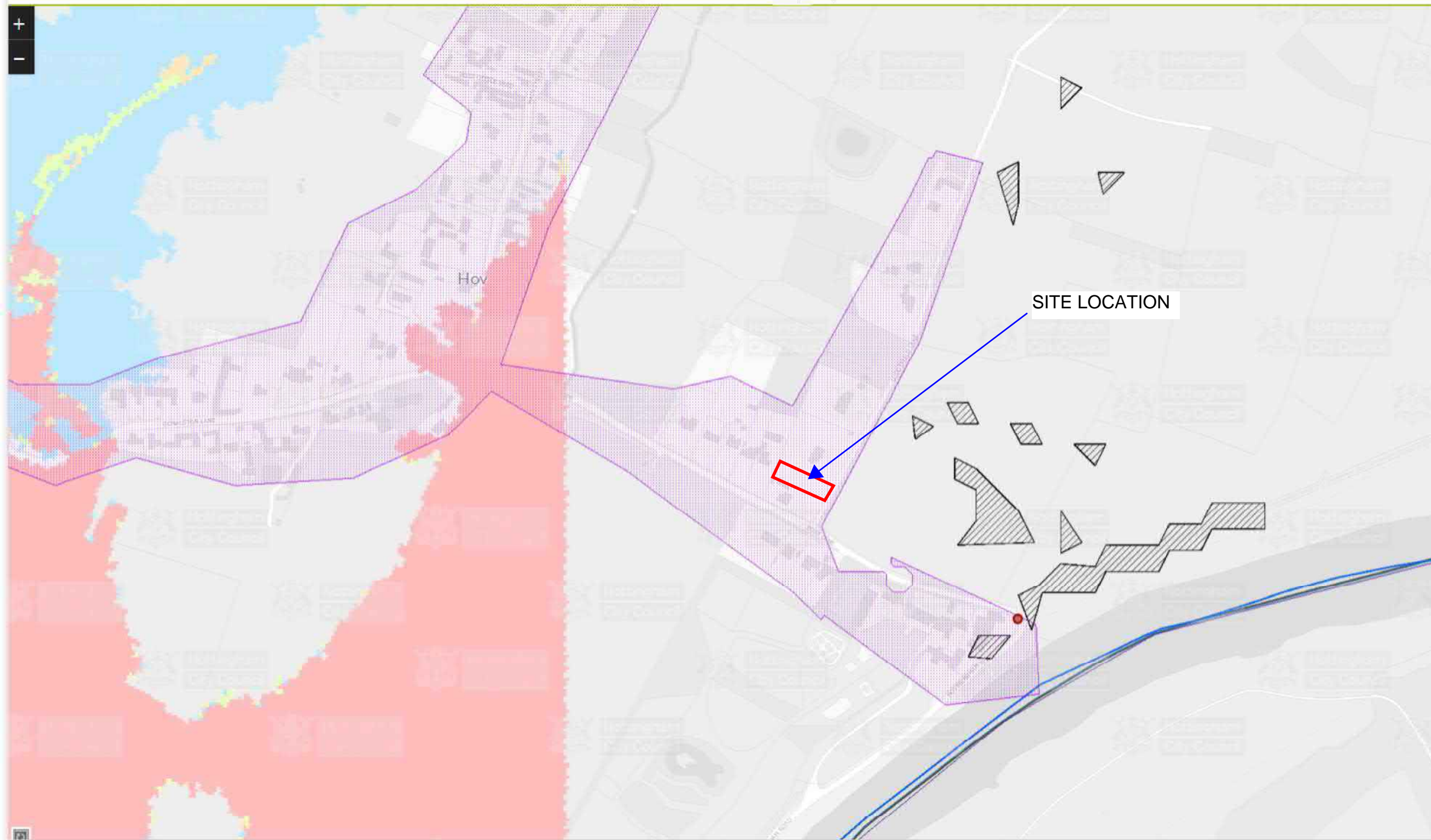
x.xx
+
1 in 1000 year
Floodplain Level (mAOD)
(plus climate change forecast)

Source:
Nottingham Tributaries SFRM, JBA,
January 2014

SITE LOCATION

A Strategic Flood Risk Assessment may be available, providing further information for this site. Please contact your Local Planning Authority to access this information as it will need to be considered within any Flood Risk Assessment submission.

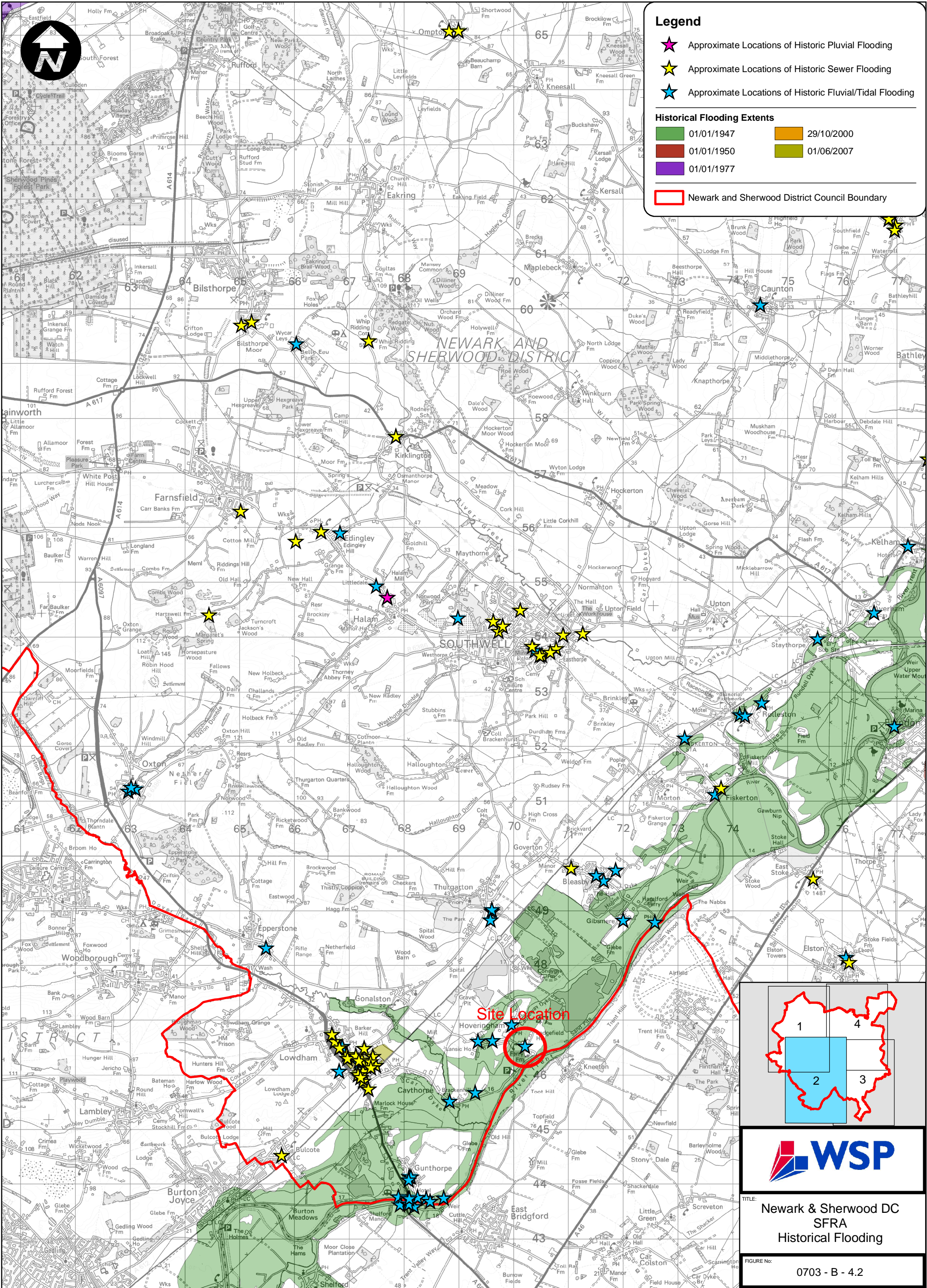
APPENDIX E – SFRA Data



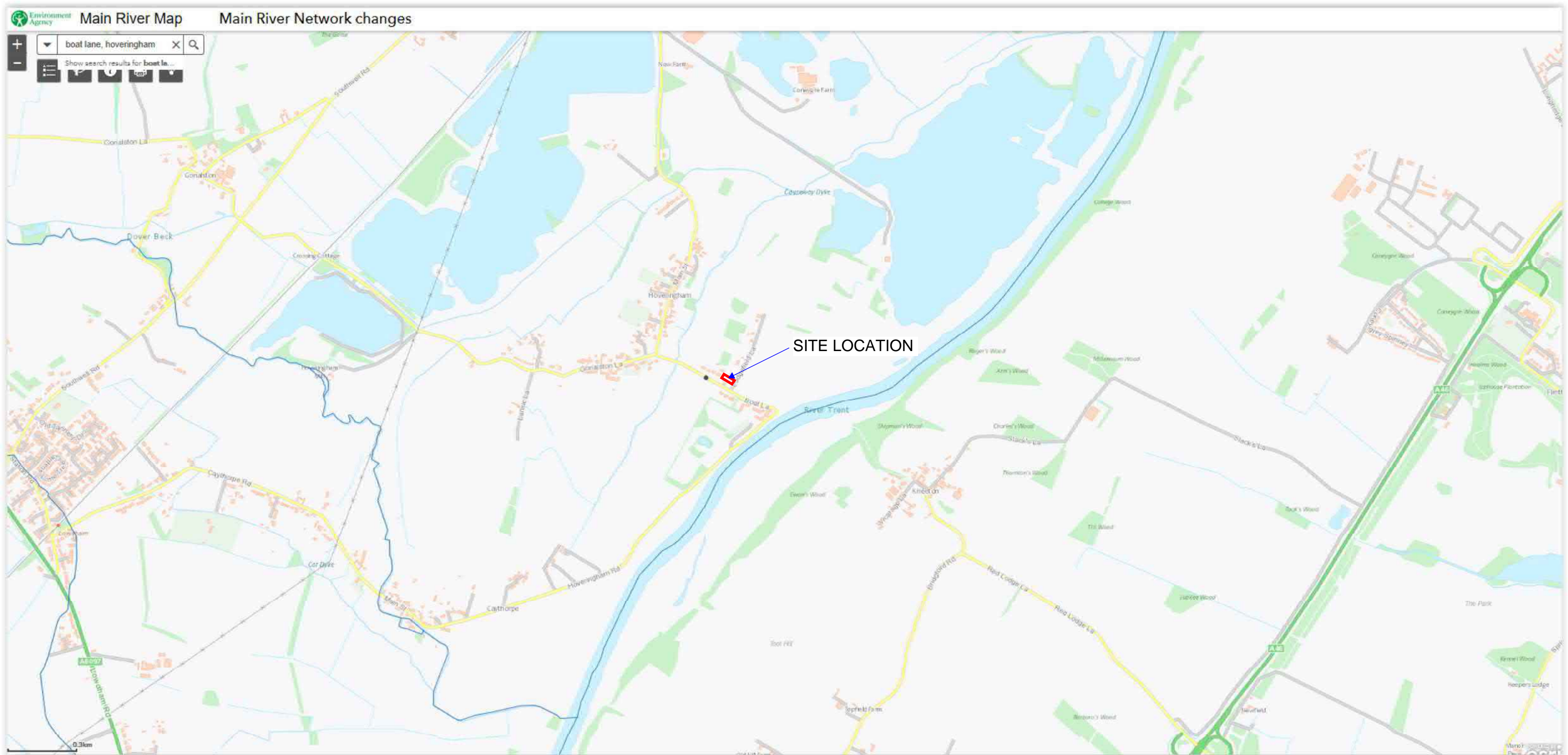
Layers

Base map Greyscale

- ☐ Defences
 - ☒ Areas Benefiting from Flood Defences
 - ☐ Flood Alert Areas
 - ☐ Flood Storage Areas
 - ☒ Flood Warning Areas
- ☐ Fluvial Sources
 - ☐ River Derwent
 - ☐ River Erewash
 - ☐ River Leen
 - ☒ River Trent
 - ☒ Crock Dumble
 - ☒ Dover Beck
 - ☒ Fairham Brook
 - ☒ Greater Nottingham SFRA
 - ☒ Greythorne Dyke
 - ☒ River Trent CC + Breach Study
 - ☒ Trent Fluvial Strategy
- ☐ Whole Extent Undefended
- ☐ GN District-Borough Boundaries
- ☐ Groundwater Sources
- ☒ Hydrology
- ☐ Pluvial Sources



APPENDIX F – Main River and Watercourses



APPENDIX G – Flood Evacuation Plan

1. Objectives

This Flood Evacuation Plan details the measures and procedures that are considered necessary to ensure the safety of the users. The following are the main objectives of the plan:

- To safely evacuate users from the site when a flood warning has been indicated by the Environment Agency.
- To implement a flood risk induction for all new users to the site. A copy of this evacuation plan is to be handed to each new user.
- To establish responsibility for procedures and implementation of the evacuation plan.




2. Flood Risk

As indicated in the main body of the report the site lies within Flood Zone 2 and 3a with a risk of flooding from the River Torne (assuming no river defences are present or a breach / over topping occurs).

3. Registration of the Site for Flood Warnings

The site will be registered to receive the Environment Agency's flood warning service. Should flooding be forecast for the area, the EA will issue a flood warning.

4. Environment Agency Flood Warning Codes:

| Flood Warning Code | What it Means | What To Do |
|---|---|--|
|  | Flooding is possible. Be prepared. When it's used Two hours to two days in advance of flooding. | <ul style="list-style-type: none">• Be prepared to act on your flood plan.• Prepare a flood kit of essential items.• Monitor local water levels and the flood forecast on our website. |
|  | Flooding is expected. Immediate action required. When it's used Half an hour to one day in advance of flooding. | <ul style="list-style-type: none">• Move family, pets and valuables to a safe place.• Turn off gas, electricity and water supplies if safe to do so.• Put flood protection equipment in place if applicable. |
|  | Severe flooding. Danger to life. When it's used When flooding poses a significant threat to life. | <ul style="list-style-type: none">• Stay in a safe place with a means of escape.• Be ready should you need to evacuate from your home.• Co-operate with the emergency services. |

| | | |
|------------------------------------|--|---|
| | | <ul style="list-style-type: none"> • Call 999 if you are in immediate danger. |
| Warnings no longer in force | <p>No further flooding is currently expected in your area.</p> <p>When it's used</p> <p>When river or sea conditions begin to return to normal.</p> | <ul style="list-style-type: none"> • Be careful. Flood water may still be around for several days. • If you've been flooded, ring your insurance company as soon as possible. |

5. Floodline Warning Direct

5.1 Site Owner must sign up to register for this service to receive Flood Alerts/Warnings via telephone, fax, SMS & email.

Registration is essential to ensure the success of this evacuation plan.

5.2 Registration for Flood Warnings:

5.2.1 Via the internet (Gov.uk Website):

<https://www.gov.uk/sign-up-for-flood-warnings>

5.2.2 Telephone:

EA Floodline Number 0345 988 1188

6. Flood Evacuation Procedure

| | |
|-------------------------------|--|
| Flood Warning Received | <p>Monitor Weather</p> <p>Monitor flood warning status</p> <p>Inform all users of the site</p> |
| Severe Flood Warning Received | <p>Evacuate to Thurgarton Lane and continue to where it intersects with Sailing Club Lane. This is outside the flood zone 2, although if the north side of Thurgarton can be easily reached it is recommended that persons evacuate there.</p> <p>Secure Site</p> <p>Inform emergency services of evacuation and maintain contact. Monitor situation and update flood status from Floodline.</p> |
| Warning no Longer in Force | On downgrade instruct users to return to site. |
| Other sources of information | Local Radio Stations |
| EA Flood Warning | https://flood-warning-information.service.gov.uk/ |

7. Conclusions

Implementation of this flood evacuation plan will ensure the safe evacuation of the site in a severe flood event.

APPENDIX H – Glossary of Terms

| | |
|-------------------------------|--|
| Attenuation | Slowing down the rate of flow to prevent flooding and erosion, with a consequent increase in the duration of flow. |
| Balancing Pond | A pond designed to attenuate flows by storing runoff during peak periods and releasing the water after the flood peak has passed. The pond always contained water. Storage periods may not be long enough to improve water quality. |
| Catchment | A river catchment is the whole area which drains either naturally or with artificial assistance to a river. It includes the drainage channels, tributaries, floodplains and washlands associated with a river and an estuary where one is present. |
| Climate Change | Flood risk may increase due to environmental changes, and one of the key uncertainties in assessing flood risk at present is the extent to which climate is changing and may change in the future. NPPF Table 5 advocates a precautionary approach to deal with uncertainties of how climate change may affect sea levels, river flows and flood risk. Current best practice recommends allowing for a 10% increase in peak rainfall intensity and a 20% increase in peak river flow to 2055. Recommended allowances for net sea level rise in the East of England are 4mm/year to 2025 and then 8.5mm/year onwards to 2055. |
| Critical Ordinary Watercourse | Ordinary watercourses which the Environment Agency and other operating authorities agree are critical because they have the potential to put large numbers of people and property at risk from flooding. |
| Design flood level | The flood level to which defences or mitigation measures are designed. This is typically the 1% (1 in 100 year) flood level. More extensive flooding and higher levels due to more extreme conditions than the design event or as a result of obstructions of the watercourse may occur at any time. |
| Development | In accordance with the definitions given in Section 55 of Town and Country Planning Act 1990, with certain exceptions development means the carrying out of building, engineering, mining or other operations, in on over or under land or the making of any material change in use of any buildings or other land. |
| Drainage (land drainage) | <p>The Water Resources Act 1991 (as amended by the Environment Act 1995) defines drainage as including:</p> <ul style="list-style-type: none">a) defence against water, including sea water;b) irrigation other than spray irrigation;c) warpingd) the carrying on, for any purpose, of any other practice which involves management of the level of water in a watercourse. |
| Exception Test | If, following application of the Sequential Test (see below), it is not possible for proposed development to be located in zones of lower probability of flooding, the Exception Test can be applied as detailed in |

| | |
|---------------------------------|--|
| | the NPPF. For the Exception Test to be passed the Flood Risk Assessment must demonstrate the proposed development provides wider sustainability benefits to the community that outweigh the estimated flood risk. |
| Flood Defence | Flood defence means the drainage of land (as defined above), and the provision of flood warning systems. |
| Flood Estimation Handbook (FEH) | The primary national guide to flood probability estimation in the UK, developed by CEH Wallingford. The use of the FEH ensures national consistency in estimating the probability of flooding, although users must be aware of the need to exercise good judgment and recognise the uncertainty inherent in flood estimation. Prediction of flood flows is not an exact science and therefore the results of estimation cannot be guaranteed, and the users make use of them at their own risk. |
| Flood return period/risk | The risk of flooding to floodplain areas and property is often described in terms of a return period. Statistical return periods relate to the long-term average time interval between events of a particular magnitude. The 1 in 100year return period flood has a one percent chance of occurring in any one year. i.e. the odds of it happening are one hundred to one. It does <u>not</u> mean that flooding of this magnitude will only occur once every 100 years. |
| Flood Zone Maps | These were produced by the Environment Agency after the 1998 and 2000 floods to improve public awareness of flood risk and updated in 2004 alongside the release of the new FRA guidance. The floodplain envelopes indicate where flooding from rivers, streams, watercourses or the sea is possible or has occurred, but ignore the presence of all flood defences such as embankments, pumping stations and walls, although the locations of flood defence structures are indicated. The maps therefore only give a general indication of potential areas at risk of flooding, generally based on either 1% probability assessments or historic flood levels. (www.environment-agency.gov.uk/subjects/flood/?lang=e) |
| Flooding | Inundation by river or sea water whether caused by inadequate or slow drainage, or by breaches or overtopping of banks or defences. |
| Floodplain | All land adjacent to a watercourse over which water flows in times of flood. |
| Fluvial Flooding | Is the process of flooding arising from a watercourse |
| Greenfield | Land which has not been developed. |
| Greenfield rate of run off | Rate of water flow which would occur over the ground surface of undeveloped land to the drainage system. |
| Hydrology | The study of water resources. |
| Main River | Watercourses shown as such on the statutory main river maps held by the Department for Environment, Flood and Rural Affairs. Main rivers are maintained by the Environment Agency and are generally larger arterial watercourses. |

| | |
|-----------------------|--|
| NPPF | National Planning Policy Framework and Technical Guidance published by Communities and Local Government in March 2012. Technical Guidance explains how flood risk should be considered at all stages of the planning and development process in order to reduce future damage to property and loss of life. |
| Ordinary Watercourses | Any watercourse that does not form part of Main River. Internal Drainage Boards maintain certain designated common watercourses within Internal Drainage Districts. Local Authorities maintain certain 'awarded' common watercourses and highway ditches outside Internal Drainage Districts. Generally, other common watercourses are the responsibility of riparian owners. |
| PAGN/FCDPAG | The DEFRA Flood Coastal Defence Project Appraisal Guidance (FCDPAG) documents provide advice on best practice for the appraisal of flood and coastal defence projects. A brief summary of these documents and the applicable standards (tables 6.1 & 6.2) are appended to this glossary. |
| Pluvial Flooding | Is the process of flooding arising from rainfall and associated surface water runoff. |
| Riparian | Relating to/or situated on the banks of a river or watercourse. |
| Runoff | Water flow over the ground surface to the drainage system. This occurs if the ground is impermeable or if permeable ground is saturated. |
| Sequential test | NPPF advocates that planners use a sequential test when considering land allocations for development to avoid flood risk where possible. Details of this test are summarised in the NPPF. |
| Soakaway | A subsurface structure into which surface water is conveyed, designed to promote infiltration. |
| Source Control | The control of runoff at or near to its source. |
| Storage Compensation | Due to the cumulative impacts of developments on the extent and function of the floodplain, the EA may require compensation storage to be provided at a site where a loss of storage in the floodplain occurs, irrespective of the negligible impacts of individual developments. In other words, an area of ground above the floodplain level must be found that can be excavated to compensate for the floodplain storage volume lost by the developing building area. In addition, the EA may insist that compensation is provided on a 'level-for-level' basis, i.e. providing compensation areas at the same level as where storage has been lost, so that there is a minimal impact on the flood patterns in the area. |
| SuDS | Sustainable Drainage Systems: A strategy, supported by a range of techniques, for dealing with surface water drainage that seeks to promote sustainable and environmentally beneficial or least damaging solutions. Developing a 'greenfield' site can significantly alter the way rainfall runs off the site. Impermeable areas such as tarmac mean that rainwater cannot infiltrate into the ground, and is instead channelled directly into rivers via drains and sewers. Flood risk may therefore be increased by the rapid flow of surface water run-off from developed areas into the watercourse. SuDS were developed initially with urban |

drainage in mind but the approach has broad application over all development drainage. SuDS techniques include Source Control.

| | |
|-------------|---|
| Swale | A grass-lined channel designed to drain water from a site as well as controlling the flow and quality of the surface water. |
| Watercourse | Any natural or artificial channel which conveys surface water. |
| Wetland | A pond that has a high proportion of emergent vegetation in relation to open water that provides a variety of habitats. |

NPPF Technical Guidance - The Sequential and Exception Tests

As set out in the National Planning Policy Framework, the aim of the Sequential Test is to steer new development to areas with the lowest probability of flooding. The flood zones (see table 1) are the starting point for this sequential approach. Zones 2 and 3 are shown on the flood map¹ with Flood Zone 1 being all the land falling outside Zones 2 and 3. These flood zones refer to the probability of sea and river flooding only, ignoring the presence of existing defences.

Strategic Flood Risk Assessments refine information on the probability of flooding, taking other sources of flooding and the impacts of climate change into account. They provide the basis for applying the Sequential Test, on the basis of the flood zones in table 1. Where Table 1 indicates the need to apply the Exception Test (as set out in the National Planning Policy Framework), the scope of a Strategic Flood Risk Assessment will be widened to consider the impact of the flood risk management infrastructure on the frequency, impact, speed of onset, depth and velocity of flooding within the flood zones considering a range of flood risk management maintenance scenarios. Where a Strategic Flood Risk Assessment is not available, the Sequential Test will be based on the Environment Agency flood zones.

The overall aim should be to steer new development to Flood Zone 1. Where there are no reasonably available sites in Flood Zone 1, local planning authorities allocating land in local plans or determining planning applications for development at any particular location should take into account the flood risk vulnerability of land uses (see table 2) and consider reasonably available sites in Flood Zone 2, applying the Exception Test if required (see table 3). Only where there are no reasonably available sites in Flood Zones 1 or 2 should the suitability of sites in Flood Zone 3 be considered, taking into account the flood risk vulnerability of land uses and applying the Exception Test if required.

¹ To access the flood map, see the Environment Agency's website at:

<http://www.environment-agency.gov.uk/homeandleisure/floods/default.aspx>

Table 1: Flood zones

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

| |
|--|
| <p>Zone 1 - low probability</p> <p>Definition</p> <p>This zone comprises land assessed as having a less than 1 in 1,000 annual probability of river or sea flooding (<0.1%).</p> <p>Appropriate uses</p> <p>All uses of land are appropriate in this zone.</p> <p>Flood risk assessment requirements</p> <p>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.</p> <p>Policy aims</p> <p>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.</p> <p>² Sustainable drainage systems cover the whole range of sustainable approaches to surface drainage management. They are designed to control surface water run off close to where it falls and mimic natural drainage as closely as possible.</p> |
| <p>Zone 2 - medium probability</p> <p>Definition</p> <p>This zone comprises land assessed as having between a 1 in 100 and 1 in 1,000 annual probability of river flooding (1% – 0.1%), or between a 1 in 200 and 1 in 1,000 annual probability of sea flooding (0.5% – 0.1%) in any year.</p> <p>Appropriate uses</p> <p>Essential infrastructure and the water-compatible, less vulnerable and more vulnerable uses, as set out in table</p> |

2, are appropriate in this zone. The highly vulnerable uses are *only* appropriate in this zone if the Exception Test is passed.

Flood risk assessment requirements

All development proposals in this zone should be accompanied by a flood risk assessment.

Policy aims

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

Zone 3a - high probability

Definition

This zone comprises land assessed as having a 1 in 100 or greater annual probability of river flooding (>1%), or a 1 in 200 or greater annual probability of flooding from the sea (>0.5%) in any year.

Appropriate uses

The water-compatible and less vulnerable uses of land (table 2) are appropriate in this zone. The highly vulnerable uses should not be permitted in this zone.

The more vulnerable uses and essential infrastructure should only be permitted in this zone if the Exception Test is passed. Essential infrastructure permitted in this zone should be designed and constructed to remain operational and safe for users in times of flood.

Flood risk assessment requirements

All development proposals in this zone should be accompanied by a flood risk assessment.

Policy aims

In this zone, developers and local authorities should seek opportunities to:

- reduce the overall level of flood risk in the area through the layout and form of the development and the appropriate application of sustainable drainage systems;
- relocate existing development to land in zones with a lower probability of flooding; and
- create space for flooding to occur by restoring functional floodplain and flood flow pathways and by identifying, allocating and safeguarding open space for flood storage.

Table 2: Flood risk vulnerability classification

| |
|---|
| <p>Essential infrastructure</p> <ul style="list-style-type: none"> • Essential transport infrastructure (including mass evacuation routes) which has to cross the area at risk. • Essential utility infrastructure which has to be located in a flood risk area for operational reasons, including electricity generating power stations and grid and primary substations; and water treatment works that need to remain operational in times of flood. • Wind turbines. |
| <p>Highly vulnerable</p> <ul style="list-style-type: none"> • Police stations, ambulance stations and fire stations and command centres and telecommunications installations required to be operational during flooding. • Emergency dispersal points. • Basement dwellings. • Caravans, mobile homes and park homes intended for permanent residential use³. • Installations requiring hazardous substances consent⁴. (Where there is a demonstrable need to locate such installations for bulk storage of materials with port or other similar facilities, or such installations with energy infrastructure or carbon capture and storage installations, that require coastal or water-side locations, or need to be located in other high flood risk areas, in these instances the facilities should be classified as “essential infrastructure”)⁵. |
| <p>More vulnerable</p> <ul style="list-style-type: none"> • Hospitals • Residential institutions such as residential care homes, children’s homes, social services homes, prisons and hostels. • Buildings used for dwelling houses, student halls of residence, drinking establishments, nightclubs and hotels. • Non-residential uses for health services, nurseries and educational establishments. • Landfill and sites used for waste management facilities for hazardous waste⁶. • Sites used for holiday or short-let caravans and camping, <i>subject to a specific warning and evacuation plan</i>.⁷ |
| <p>Less vulnerable</p> <ul style="list-style-type: none"> • Police, ambulance and fire stations which are <i>not</i> required to be operational during flooding. • Buildings used for shops, financial, professional and other services, restaurants and cafes, hot food takeaways, offices, general industry, storage and distribution, non-residential institutions not included in |

“more vulnerable”, and assembly and leisure.

- Land and buildings used for agriculture and forestry.
- Waste treatment (except landfill and hazardous waste facilities).
- Minerals working and processing (except for sand and gravel working).
- Water treatment works which do *not* need to remain operational during times of flood.
- Sewage treatment works (if adequate measures to control pollution and manage sewage during flooding events are in place).

Water-compatible development

- Flood control infrastructure.
- Water transmission infrastructure and pumping stations.
- Sewage transmission infrastructure and pumping stations.
- Sand and gravel working.
- Docks, marinas and wharves.
- Navigation facilities.
- Ministry of Defence installations.
- Ship building, repairing and dismantling, dockside fish processing and refrigeration and compatible activities requiring a waterside location.
- Water-based recreation (excluding sleeping accommodation).
- Lifeguard and coastguard stations.
- Amenity open space, nature conservation and biodiversity, outdoor sports and recreation and essential facilities such as changing rooms.
- Essential ancillary sleeping or residential accommodation for staff required by uses in this category, *subject to a specific warning and evacuation plan.*

³ For any proposal involving a change of use of land to a caravan, camping or chalet site, or to a mobile home site or park home site, the Sequential and Exception Tests should be applied.

⁴ See Circular 04/00: *Planning controls for hazardous substances* (paragraph 18) at:

www.communities.gov.uk/publications/planningandbuilding/circularplanningcontrols

⁵ In considering any development proposal for such an installation, local planning authorities should have regard to planning policy on pollution in the National Planning Policy Framework.

⁶ For definition, see *Planning for Sustainable Waste Management: Companion Guide to Planning*

⁷ See footnote 3.

www.defra.gov.uk/science/ProjectData/DocumentLibrary/FD23203364TRP.pdf

- a. This classification is based partly on Department for Environment, Food and Rural Affairs and Environment Agency research on *Flood Risks to People (FD2321/TR2)*⁸ and also on the need of some uses to keep functioning during flooding.
- b. Buildings that combine a mixture of uses should be placed into the higher of the relevant classes of flood risk sensitivity. Developments that allow uses to be distributed over the site may fall within several classes of flood risk sensitivity.
- c. The impact of a flood on the particular uses identified within this flood risk vulnerability classification will vary within each vulnerability class. Therefore, the flood risk management infrastructure and other risk mitigation measures needed to ensure the development is safe may differ between uses within a particular vulnerability classification.

The DEFRA Flood and Coastal Defence Project Appraisal Guidance (FCDPAG) documents provide advice on best practice for the appraisal of flood and coastal defence projects. Volume 3: Economic Appraisal gives indicative standards for flood and coastal defence in England and Wales. The tables below are provided “as an aid to authorities to help in establishing the range of options to be considered, though they should not constrain the need to consider a full range of alternatives. They do not represent any entitlement to protection or minimum level to be achieved”. Please refer to the FCDPAG documents at <http://www.defra.gov.uk/envIRON/fcd/pubs/pagn/default.htm> for further information.

| Land use band | Indicative standards of protection | | | |
|----------------------|------------------------------------|-----------------------|---------------|-----------------------|
| | Fluvial | | Coastal | |
| | Return period | Annual probability of | Return period | Annual probability of |
| A B | 50-200 | 0.005-0.02 | 100-300 | 0.003-0.01 |
| C D | 25-100 | 0.01-0.04 | 50-200 | 0.005-0.02 |
| E | 5-50 | 0.02-0.20 | 10-100 | 0.01-0.10 |

Table 6.2 **Description of Land Use Bands**

| <i>Land use band</i> | <i>Indicative range of housing units (or equivalent) per km of coastline or single river bank</i> | <i>Description</i> |
|----------------------|---|---|
| A | >=50 | Typically intensively developed urban areas at risk from flooding and/or erosion |
| B | >=25 to <50 | Typically less intensive urban areas with some high-grade agricultural land and/or environmental assets of international importance requiring protection. |
| C | >=5 to <25 | Typically large areas of high-grade agricultural land and/or environmental assets of national significance |
| D | >=1.25 to <5 | Typically mixed agricultural land with occasional, often agriculturally related, properties at risk. Agricultural land may be prone to flooding, water logging or coastal erosion. May also apply to environmental assets of local significance. |
| E | >0 to <1.25 | Typically low-grade agricultural land, often grass, at risk from flooding, impeded land drainage or coastal erosion, with isolated agricultural or seasonally occupied properties at risk, or environmental assets at little risk from frequent inundation. |