

FLOOD RISK ASSESSMENT

PROPOSED HOLIDAY LETS
LEADENHALL FARM HOSPITAL COTTAGES
HOLBEACH St. MARKS
HOLBEACH
PE12 8HB



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August 2020 Version 1

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FLOOD RISK ASSESSMENT FOR PROPOSED HOLIDAY LETS LEADENHALL FARM HOSPITAL COTTAGES HOLBEACH St. MARKS, HOLBEACH, PE12 8HB

INTRODUCTION

The Government has placed increasing priority on the need to take full account of the risk associated with flooding at all stages of the planning and development process. This seeks to reduce the future damage to property and the risk to life from incidents of flooding. Their expectations relating to flooding are contained in the National Planning Policy Framework Feb 2019, (NPPF), which identifies how the issue of flooding is dealt with in the drafting of planning policy and the consideration of planning applications by avoiding inappropriate development in areas at risk from flooding and to direct development away from areas at highest risk.

The NPPF provides that development in areas at risk of flooding should be avoided and seeks to direct development away from areas at highest risk. There is a sequential, risk-based approach to the location of development avoiding where possible, flood risk to people and property managing any residual risk and taking account of the impacts of climate change.

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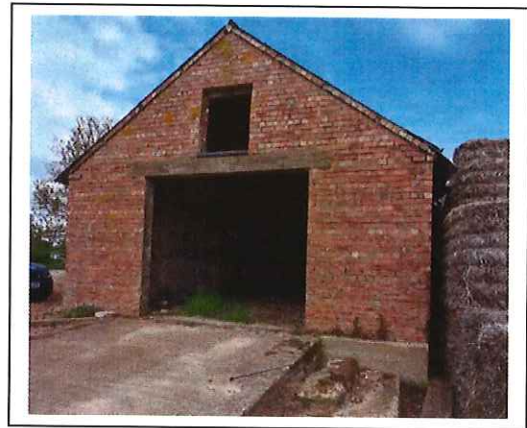
APPLICATION SITE

The proposed site is located at Leadenhall Farm Hospital Cottages, Holbeach St. Marks, Holbeach PE12 8HB, within the administrative area of South Holland District Council. The National Grid Reference is TF36790 33536. **Plan 1**

This flood risk assessment has been prepared for a planning application for the change of use of two, brick single storey, redundant agricultural barns, into two holiday let units, which will not be used for permanent residential purposes. **Plans 2, 3 & 4**



Barn 1



Barn 2

The Site would be classed as Non-Major Development applying the National Planning Policy Guidance (NPPG) as the site is to be developed for less than 1 hectare.

The National Planning Policy Framework Guidance NPPG defines three levels of flood risk depending upon the annual probability of fluvial/sea flooding occurring.

Zone 1 – Low Probability (<0.1%)

Zone 2 – Medium Probability (0.1 – 1.0%)

Zone 3 – High Probability (>1.0%)

The proposed development site is shown mainly to be within Flood Zone 3 High Probability' as detailed on the Environment Agency's Flood Zone Maps **without defences**, and as defined in Table 1 of NPPG. **Map1**

Table 1: Flood Zones Definition

Flood Zone 3- High Probability
Definition 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. The water-compatible and less vulnerable uses of land are appropriate in this zone. The highly vulnerable uses should not be permitted in this zone. The more vulnerable and essential infrastructure uses 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 uses in times of flood Flood Risk Assessments requirements All proposals in this zone should be accompanied by a Flood Risk Assessment. Policy aims 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 techniques. • relocate existing development to land with a lower probability of flooding. • create space for flooding to occur by allocating and safeguarding open space for flood storage.

Applying the Flood Risk Vulnerability Classification in Table 2 of NPPG, the proposed holiday use for the site is classified as "More Vulnerable," Table 1 of NPPG states that such uses are permitted in this zone, subject to a

specific warning and evacuation plan.

Table 2: Flood Risk Vulnerability Classification

More Vulnerable
• 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 waste. • Sites used for holiday or short-let caravan and camping, subject to a specific warning and Evacuation Plan.

Site Levels

From Lidar 2m DTM, to Ordnance Datum, the average site ground levels around Barn 1 average 3.43mODN for Barn 2 average 3.74mODN, with the inner courtyard 3.38mODN. The road level at the site entrance is elevated at 4.19mODN. **Plan 5**

DRAINAGE AUTHORITIES

Environment Agency

The Environment Agency is responsible for reducing the risk of flooding from designated main rivers and from the sea.

The potential source of flooding which could affect the development site has been identified as:

- River Welland/ Wash Estuary

The River Welland lies some 1.4km to the north of the site and the Wash some 2.96km to the east of the site.

The flood zone maps indicate that the area would be flooded without flood defences.). The Flood Map indicates the area at risk of flooding, **assuming no flood defences exist**, for a flood event with a 0.5% chance of occurring in any year for flooding from the sea, or a 1% chance of occurring for fluvial (river) flooding. It also shows the extent of the Extreme Flood Outline which represents the extent of a flood event with a 0.1% chance of occurring in any year, or the highest recorded historic extent if greater. In some locations, such as around the fens and the large coastal floodplains there are many kilometres of raised flood defences. To meet the requirements of the National Planning Policy Framework, these defences are removed in their entirety to produce the Flood Map for Planning (Rivers and Sea). The map therefore shows the full extent of areas that would be at risk of flooding if no defences existed and water could spread out across these large floodplains. This flooding could cover large areas of land but to relatively shallow depths and could leave pockets of locally slightly higher land as isolated dry islands.

Flood Zones

These maps show that the site of the proposed holiday lets is considered at risk from flooding as it is all located within an area zoned as Flood Zone 3a. The maps indicate that the area would be flooded without flood defences, which are in place, (with an annual probability of more than 0.5% i.e. return frequency of less than 1 in 200 years for tidal flooding or more than 1.33% return frequency of less than 1 in 100 years for fluvial flooding). **Map 1**

Risk of Flooding from Rivers & Sea

The risk of flooding from Rivers and Sea Map shows that the site is at a High risk of flooding. **High risk** means that each year this area has a chance of flooding of greater than 3.3%. This takes into account the effect of any flood defences in the area. These defences reduce but do not completely stop the chance of flooding as they can be overtopped or fail. **Map 2**

Tidal defences

The area is not affected by any flooding from a Main River and therefore would only be affected by tidal flooding from the Wash. The Wash Banks constitute the first line of defence against any tidal flooding. These consist of earth embankments along the shores of the wash and are invariably behind an area of intertidal salt marsh which protects them against damage from wave action, though in the relatively sheltered environment of the Wash this is less of a hazard than the North Sea coastline. The site lies behind two lines of earth sea defences

The tidal defences protecting this site consist of earth embankments. They are in fair condition and reduce the risk of flooding (at the defence) to a 0.67% (1 in 150) chance of occurring in any year. The Environment Agency inspect these defences routinely to ensure potential defects are identified. These earth embankments crest levels at the edge of the river is 7.69mODN and the levels of the floodplain vary from 3.50mODN to 3.25mODN. Approximately 650m to the north there is an old sea defence bank at a level 5.75mODN This floodplain which is over 1.5km wide would provide storage of flood water and protect the site from rapid inundation of flood water.

-

Breach Analysis to Wash & River Welland Tidal Defences

From Lincolnshire & Northampton shire Area Tidal Modal Analysis (June 2006) **Map 3**

The base date for the data is 2017 for the still water levels, the Peak tide levels Present Day (2017) at Fosdyke Bridge for the 50% confidence bound 0.1% (1 in 1000year) = 6.29mODN

Higher Central Peak tide levels (2120) at Fosdyke Bridge for the 0.1% (1 in 1000) = 6.29mODN plus climate change from Table 3 (2117 – 2020) 1089mm = 7.48mODN

Taking the precautionary approach, the Hazard Rating following a breach which in Flood Risk Assessment (FD

2320) Guidance for New Development Phase 2 R& D Technical Report these are classified as low <0.75, moderate 0.75-1.25, significant 1.25-2.50 and extreme >2.50 based upon an empirical measure of velocity and depth.

Flood Hazard			Description
	<0.75	Low	Caution – Flood Zone with shallow flowing water or deep standing water.
	0.75 – 1.25	Moderate	Danger for Some - (i.e. children) Danger Flood Zone with deep or fast flowing water.
	1.25 – 2.0	Significant	Danger for Most – Danger Flood Zone with deep fast flowing water.
	>2.0	Extreme	Danger for All – Extreme Danger Flood Zone with deep fast flowing water.

$$HR = d \times (v + 0.5) + DF$$

Where V = Flood flow velocity (m/sec) D = Flood depth (m)

DF = A debris factor included to represent the greater damage, or risk of injury to people, that can occur if debris is swept along with the water. = 0.5 for depths <0.25 or 1.0 for depths

For the degree of Flood Hazard to be classified as low HR must be <0.75.

The Environment Agency has recently carried out a Tidal Hazard Mapping for the Wash following a breach to the defences. Following a breach to the defences, the Lincolnshire & Northampton shire Area Tidal Hazard Maps Scenario year 2006, for the 1 in 1000-year event, shows that Barn 1 is in a Hazard rating area between 1.25 and 2.0 (Danger for Most) with a predicated depth of flow of 0.5 – 1.0m and velocity of flow 0 – 0.3m/sec. Barn 2 is in a Hazard rating area between 0.75 - 1.25 (Danger for Some) with a predicated depth of flow of 0.25 – 0.5m and velocity of flow 0 – 0.3m/sec

With climate change up to year 2115 the maps show that for Scenario annual chance 1 in 1000-year that Barn 1 is in a Hazard rating area Greater than (Danger for All) with a predicated depth of flow of greater than 1.6m and velocity of flow 0.3 – 1.0m/sec. Barn 2 is in a Hazard rating area Greater than (Danger for All) with a predicated depth of flow between 1.0 - 1.6m and velocity of flow 0.3 – 1.0m/sec.

Map 4 shows the Hazard Rating for the present day and **Map 5** shows the results for Hazard Rating, Depth, & Velocity, for year 2115, for the Wash scenario annual chance 1 in 1000, taken from the Environment Agency's, Lincolnshire & Northampton shire Area Tidal Hazard Mapping.

The Environment Agency has also produced maps based on computer modelling of simulated overtopping of defences along the coastline for specific tidal scenarios. The maps only consider the consequences of overtopping of defences and do not show the possible consequences of breaches of the tidal defences. For future climate change scenarios, it is assumed that the defences remain at 2006 heights.

For the scenario year 2006 both barns are not affected by overtopping of the defences **Map 6** and for scenario

year 2115 the 1 in 1000-year annual chance from overtopping, both barns are in a Hazard rating area between 1.25 – 2.0 (Danger for Most) with a predicated depth of flow of between 0.5 – 1.0m and velocity of flow 0 – 0.3m/sec. **Map 7**

The minimum mitigation measures required for single storey developments or developments that do have any ground floor sleeping shall be determined by the flood depths arising from the 2115 0.1% breach scenario. Any proposals that do not included ground floor sleeping shall be determined by the flood depths arising from the 2115 0.5% breach scenario.

With the main risk of flooding to the site being from tidal sources and as the floor level of the holiday lets cannot be raised to be above the worst case flood level, it is recommended that the period of occupancy is restricted so that they will not be occupied between 1st November (or the following Sunday if half term extends into November) in any one year and the 14th March in the succeeding year, this length of season is in line with the current guidance. The restricted season will ensure that the building is not occupied during the winter months when the likelihood of flooding is increased due to the chance of coastal storms and tidal surges. In addition to the occupancy restriction, a robust evacuation and warning plan will be prepared, and the holiday lets would not be occupied when a serve flood warning has been issued by the Environment Agency for the area.

This will ensure that the development remains safe for its residents when taking in to account the restricted occupancy period. The ground floor level for the holiday lets would be below the predicted flood level, following a breach or overtopping of the flood defences, which may result in some damage to the interior of the building.

SOUTH HOLLAND DISTRICT COUNCIL

In order to inform the process of risk assessment and site selection the District Council commissioned Haskoning UK Ltd Consultants to prepare a Strategic Flood Risk Assessment in December 2002. They have carried out an update of this report and this report was published in January 2010 and this was further updated in February 2017.

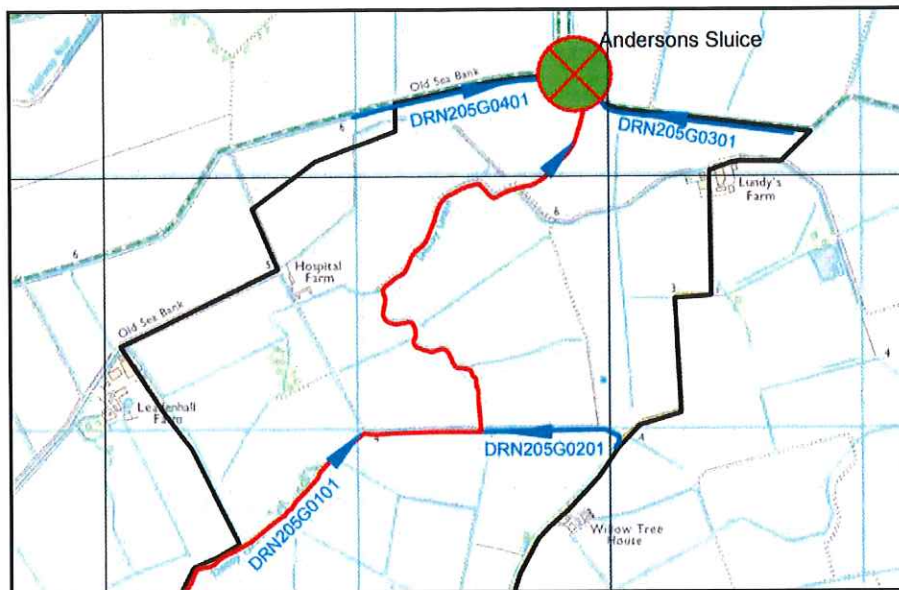
The Hazard maps contained within the SHDC FRA confirm the EA maps which have been used in this report.

SOUTH HOLLAND INTERNAL DRAINAGE BOARD

The farm holding lies with the catchment area South Holland Internal Drainage Board who have a responsible to operate and maintain the arterial fluvial system.

IDB drains were designed to provide at least a 1 in 10-year standard of service with a freeboard of at least 900mm. This normally provides at least a 1 in 50-year standard of service against overtopping and in many cases a 1 in 100-year standard at the present time.

The site lies within Catchment 'O' Andersons Catchment. The Board has a high priority watercourse to the east of the site Ref DRN205G0101 which outfalls at Andersons Sluice.



Extract from South Holland Drainage map

FLOODING FROM OTHER SOURCES

Flooding is a natural process and can happen at any time from sources other than watercourses and the sea.

- Flooding from land can occur from intense rainfall, often over short duration of time that is unable to soak into the ground or enter the drainage system. However, with the natural topographic nature of the ground having no high ground around the site. With the proposed ground floor levels being set at 180mm above the existing ground floor level this will not cause any rapid inundation of the site.
- The area is not known to suffer from any groundwater problems.
- Flooding from sewers can occur from over loading from heavy rainfall caused by blockages or having inadequate capacity. There are no public sewers in the proximity of the site.
- Non-natural or artificial sources of flooding such as reservoirs, lakes, or canals where water is stored above natural ground level could cause flooding if the structure fails or is over topped. There are no known sources within the vicinity of the site.

RESIDUAL RISKS

There is always a possibility of a flood more than that allowed for which might conceivably cause some flooding to the units. However, such an event would have a very low probability and the risk of flooding to the property

would be extremely small. It is therefore considered that the residual risks associated with flooding are not significant.

SURFACE WATER FLOODING

The majority of the site for the proposed units is not shown on the Low Risk scenario Surface Water flood maps, for the 1 in 1000-year event, to be affected from surface water flooding. This type of flooding is usually short lived and associated with heavy downpours of rain, thunderstorms etc. **Map 8**

The maps for surface water and revised maps for river and sea flooding define the risk as High, Medium, Low and Very Low. The chance of flooding for the area defined in any given year is shown below:

- **High:** greater than 1 in 30 (3.3%).
- **Medium:** between 1 in 100 (1%) and 1 in 30 (3.3%).
- **Low:** between 1 in 1000 (0.1%) and 1 in 100 (1%).
- **Very Low:** less than 1 in 1000 (0.1%)

Unlike the fluvial mapping, which is based on a detailed hydraulic model, this mapping is based purely on applying rainfall to a digital terrain model. As such this mapping serves to represent a worst-case scenario which may well overstate the actual probability of flooding in this area.

There is a caveat on the Defra Data website, as to the use of these maps and that they are not to be used to identify that an individual property will flood. Because of the way they have been produced and the fact that they are indicative, these maps are not appropriate to act as the sole evidence for any specific planning or regulatory decision or assessment of risk in relation to flooding at any scale without further supporting studies or evidence.

SEQUENTIAL APPROACH

When applying the sequential approach for flood risk in accordance NPPF the site would fall into Flood Zone 3 (High Probability) as the site is shown to be within the tidal flood plain as shown on the Environment Agency's Flood Map without defences in place.

The Environment Agency categorise land into one of three Flood Zones.

- Flood Zone 1 is land outside the 0.1% floodplain (with a chance of flooding of less than 0.1% chance in any given year)
- Flood Zone 2 is land that falls between the 1 in 100-year extent and the 1 in 1000-year extent (a chance of flooding between 1% and 0.1% in any given year).
- Flood Zone 3a is land which falls within the 1 in 100-year flood extent (has a 1% chance of a flood

occurring in any given year).

Applying the Flood Risk Vulnerability Classification in Table 2 of NPPG, the proposed development for residential use is classified as, "More Vulnerable" with Table 1 of NPPG stating that such uses are appropriate in this zone (as summarised in Table 3 NPPG).

Table 3: Flood Risk Vulnerability and Flood Zone 'Compatibility'

Flood Risk Vulnerability Classification		Essential Infrastructure	Water Compatible	Highly Vulnerable	More Vulnerable	Less Vulnerable
Flood Zone	Flood Zone 1	✓	✓	✓	✓	✓
	Flood Zone 2	✓	✓	Exception Test Required	✓	✓
	Flood Zone 3a	Exception Test Required	✓	✗	Exception Test Required	✓
	Flood Zone 3b Functional Floodplain	Exception Test Required	✓	✗	✗	✗

Sequential Test and Exceptions Test

NPPF Guidance Paragraphs 155 - 165 requires development within high areas of flood risk be determined using a sequential risk-based approach to the location of development to avoid where possible flood risk to people and property and manage any residual risk, taking account the impacts of climate change.

The aim of the Sequential Test is to steer new development to areas with the lowest probability of flooding. The NPPF states that development should not be permitted if there are reasonably available sites appropriate for the proposed development in areas with a lower probability of flooding. It is important to note that the Sequential Test does not specifically mean that sites such as this cannot be developed, rather that sites at less risk should be developed first.

Within Flood Zone 3, generally "More Vulnerable" developments such as residential are discouraged, however, due to this being a change of use to an existing building, the Sequential Test and Exception Test are not applicable as moving the existing buildings is not an option. As set out in the National Planning Policy Framework Technical Guidance (para.164), change of use should not be subject to the sequential and exception tests but will still need to meet the requirements of a site-specific flood risk assessment.

CLIMATE CHANGE

Global warming is now recognised that it is likely to affect the frequency and severity of extreme events as both tidal and fluvial flooding. The Climate change allowances in the NPPF Guidance was updated on the 17th December 2019.

The site is located within the Anglian River Basin, for sites within Flood Zone 3a and for "More Vulnerable" land uses, the Upper End and Higher Central river flow allowances figures in Table 1 should be used.

Table 1 Peak River Flow Allowances

Table 1 Peak river flow allowances by river basin district (1981 to 2000 baseline)				
River basin District	Allowance category	Total potential change anticipated for '2020s' (2015 to 2039)	Total potential change anticipated for '2050s' (2040 to 2069)	Total potential change anticipated for '2080s' (2070 to 2115)
Anglian	Upper End	25%	35%	65%
	Higher central	15%	20%	35%
	Central	10%	15%	25%

The effect of global warming on peak rainfall allowances is given in Table 2.

Table 2 Peak Rainfall Intensity

Table 2 Peak rainfall intensity allowance in small and urban catchments (1981 - 2000 baseline)			
Applies across all of England	Total potential change anticipated for 2010 to 2039	Total potential change anticipated for 2040 to 2059	Total potential change anticipated for 2060 to 2115
Upper End	10%	20%	40%
Central	5%	10%	20%

The annual sea rise due to climate change is given in NPPF and the recommended contingency allowances are stated in Table 3.

Table 3 Peak Sea Level Rise

Table 3 Peak sea level allowance for each epoch in (mm) per year with cumulative sea level rise for each epoch in brackets (use 1981 to 2000 baseline)						
Area of England) (Use River Basin	Allowance	2000 to 2035	2036 to 2065	2066 to 2095	2096 to 2125	Cumulative Rise 2000 to 2125 (m)
Anglian	Higher Central	5.8 (203mm)	8.7 (261mm)	11.6 (348mm)	13 (390mm)	1.20m
Anglian	Upper End	7 (245mm)	11.3 (339mm)	15.8 (474mm)	18.1 (543mm)	1.6m

Higher Central

Base year 2017 – 2035 @ 5.8mm/year (18 years x 5.8mm) = 104.4mm

2036 – 2055 @ 8.7mm/year (30 years x 8.7) = 261mm

2066 – 2095 @ 11.6mm/year (30 years x 11.6) = 348mm

2096 – 2120 @ 13mm/year (24 years x 13) = 312mm

Overall total = **1025mm**

Peak tide levels Present Day (2017) at Layers Sluice 0.1% (1 in 1000) = 6.29mODN and for year 2120 = 7.32mODN

Upper End

Base year 2006 – 2035 @ 7mm/year (18 years x 7mm) = 126mm

2036 – 2055 @ 11.3mm/year (30 years x 11.3) = 339mm

2066 – 2095 @ 15.8mm/year (30 years x 15.8) = 474mm

2096 – 2120 @ 18.1mm/year (24 years x 18.1) = 434mm

Overall total = **1373mm**

Peak tide levels Present Day (2017 at Layers Sluice 0.1% (1 in 1000) = 6.29mODN and for year 2120 = 7.66mODN

The current Hazard Mapping has a Base year 2006 – 2115

Table 3 Peak sea level allowance for each epoch in (mm) per year with cumulative sea level rise for each epoch in brackets (use 1990 baseline)					
Area of England) (Use River Basin maps	1990 to 2025	2026 to 2050	2051 to 2080	2081 to 2115	Cumulative Rise 1990 to 2115 (m)
East, Midlands, London, South East	4 (140mm)	8.5 (212.5mm)	12 (360mm)	15 (525mm)	1.24m

Base year 2017 – 2025 @ 4mm/year (18 years x 4mm) = 72mm

2026 – 2050 @ 85mm/year (30 years x 8.7) = 212.5mm

2051 – 2080 @ 11.6mm/year (30 years x 12) = 360mm

2091 – 2115 @ 15mm/year (24 years x 15) = 525mm

Overall total = **1170mm**

Peak tide levels Present Day (2017) at Layers Sluice 0.1% (1 in 1000) = 6.29mODN and for year 2115 Higher Central) = 7.46mODN

It is therefore concluded, that until the Environment Agency undertake new modelling for the Coastal Hazard Mapping, that the present-day breach mapping can be used for determining finished floor levels for residential development.

DRAINAGE STATEMENT

Surface Water

Construction on any undeveloped area has the potential to increase the rates and volumes of surface water runoff, due to the replacement of pervious land with impervious surfaces. In this case, the areal footprint of the building, access tracks and other infrastructure is unchanged. As there are no proposals to increase the footprint of the buildings, post development, the roof water from the buildings will continue to discharge to the existing outlets which have functioned over many years without giving any cause for complaint. These will be checked and cleaned out, as necessary.

All access roads and parking areas are already available.

Foul Drainage

As the site is not located within an area served by public sewers an appropriate sized package treatment plant will be provided for the proposed development.

As there is a positive drainage system capable of receiving flows from the development there is no likely impact on neighbouring property.

FLOOD PROTECTION

Any impact of damage to the properties can be foreseen and mitigated against by relatively simple design and construction techniques. There are two forms of flood protection works: -

- **Flood-resistance or proofing works:** - these try to reduce the amount of water entering a building.
- **Flood-resilient works:** - these reduce the amount of damage caused by water entering the building.

The proposed property will have the following resilient measures incorporated in the construction in accordance with "Improving the flood performance of new buildings" CLG (2007).

- It is proposed that floor level for the two barns be raised 180mm above the existing slab level.
- It is recommended that all external doorways to be flood doors manufactured by 'Stormguard' or similar. These flood doors have been tested against the standard set of tests as defined in PAS 1188-1:2014 which represent typical conditions that might be experienced during a flood in the UK. This will provide some additional protection during the winter months when the holiday lets are not occupied.
- Use closed cell cavity insulation to the ground floor with a solid concrete slab with a ceramic tiled finish. All tiles to be bedded on a water-resistant cement bedding with a water-resistant grout.
- An internal cement render will be used for a minimum of 600mm above the finished floor level to reduce flood water leakage.
- Arrange for all service circuits to be routed at high level and fed downwards, where practical socket outlets, boilers etc. to be a minimum of 1.0m above the raised ground floor level.
- As this site is in an area that can receive flood warnings from the Environment Agency Floodline Warning Direct system. It is recommended that the property Owner contact the Environment Agency's Floodline on 0845 988 1188 to register the properties to receive advance warning of flooding by telephone, mobile, fax, SMS text, email or pager. The Environment Agency aim to issue a 'severe flood warning' approximately 2 hours before existing defences are overtopped.

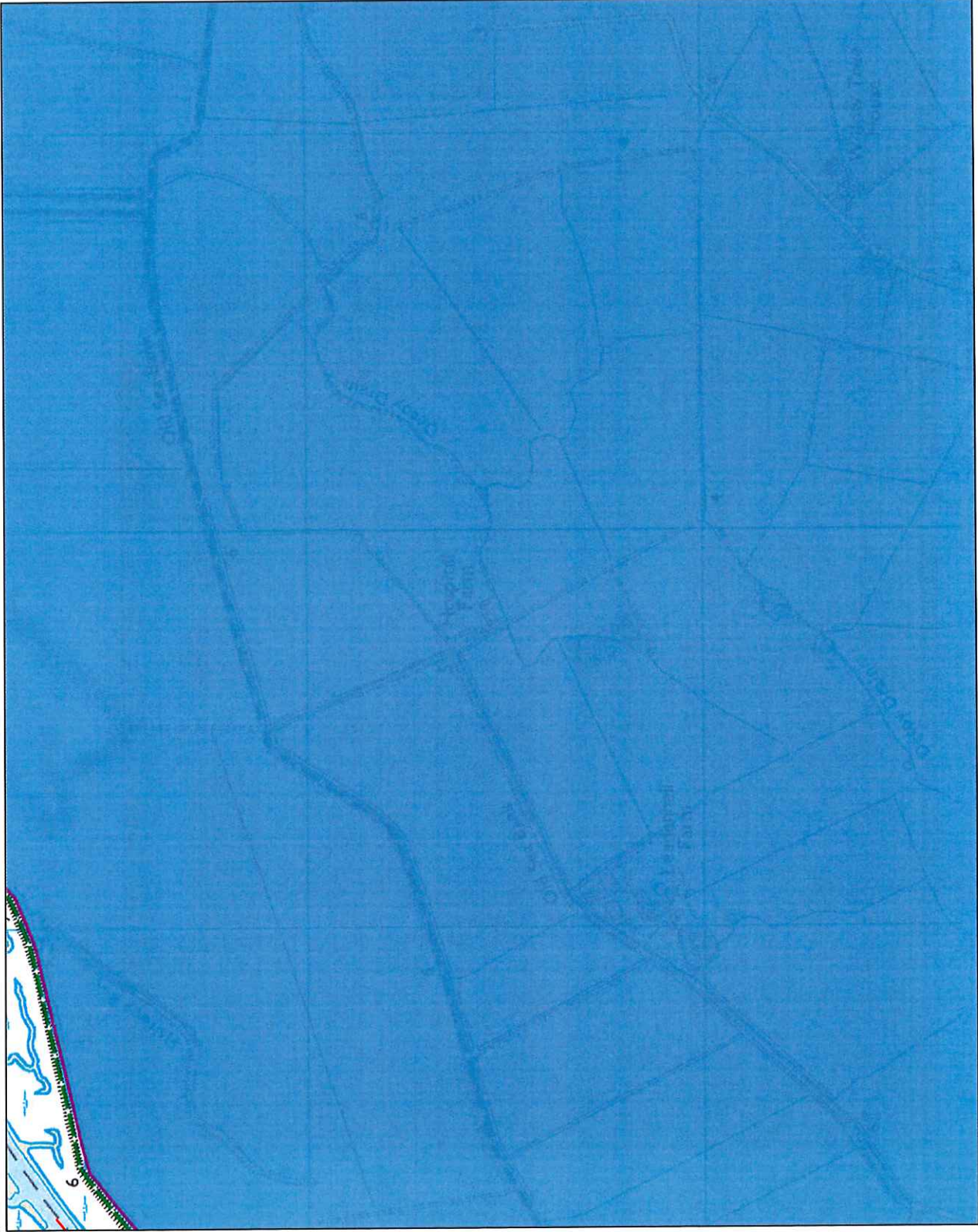
CONCLUSION

- The site does have the protection of tidal flood defences which are well maintained by the Environment Agency.
- Both the proposed holiday lets are shown to be located within Flood Zone 3a 'High Probability' as detailed on the Environment Agency's Flood Zone Maps **without defences**, and as defined in Table 1 of NPPG.
- The Flood Risk Vulnerability Classification in Table 2 of NPPG the proposed holiday let residential development is classified as "More Vulnerable", with Table 1 of NPPG stating that such uses are appropriate in this flood zone subject to the Exception Test.
- As set out in the National Planning Policy Framework Technical Guidance (para.164), change of use should not be subject to the sequential and exception tests but will still need to meet the requirements of a site-specific flood risk assessment.
- It is proposed that floor level for the two barns be raised 180mm above the existing slab level.
- The risk of flooding from Rivers and Sea Map shows that the site is at a High risk of flooding. **High risk** means that each year this area has a chance of flooding of greater than 3.3%.
- With the main risk of flooding to the site being from tidal sources and as the floor level of the holiday lets cannot be raised to be above the worst case flood level, following a breach or over topping the defences, it is recommended that the period of occupancy is restricted so that they will not be occupied between 1st November (or the following Sunday if half term extends into November) in any one year and the 14th March in the succeeding year, this length of season is in line with the current guidance. The restricted season will ensure that the building is not occupied during the winter months when the likelihood of flooding is increased due to the chance of coastal storms and tidal surges. They will not be used as a permanent residence.
- A Flood Warning and Evacuation Plan will be prepared, the units will not be occupied when a Serve Flood Warning has been issued by the Environment Agency.
- The proposal for holiday lets would result in the reuse of existing buildings, which would maintain the character and appearance of the buildings. This use would provide economic growth which is supported by the NPPF and the Local Plan.
- There are no local site-specific risks that would adversely affect the flood risk categorisation of the

site. Similarly, there are considered to be no increased risk of offsite flooding risks as a result of the development.

- Flooding from other sources is unlikely to affect the site.

Flood Map centred on TF 36790 33536 - created August 2020 [Ref: CCN-2020-178046]



Scale 1:10,000

Legend

- Main River
- Raised Defences
- Flood Storage Areas
- Area at Risk of Flooding from Rivers or The Sea
- Extreme Flood Outline

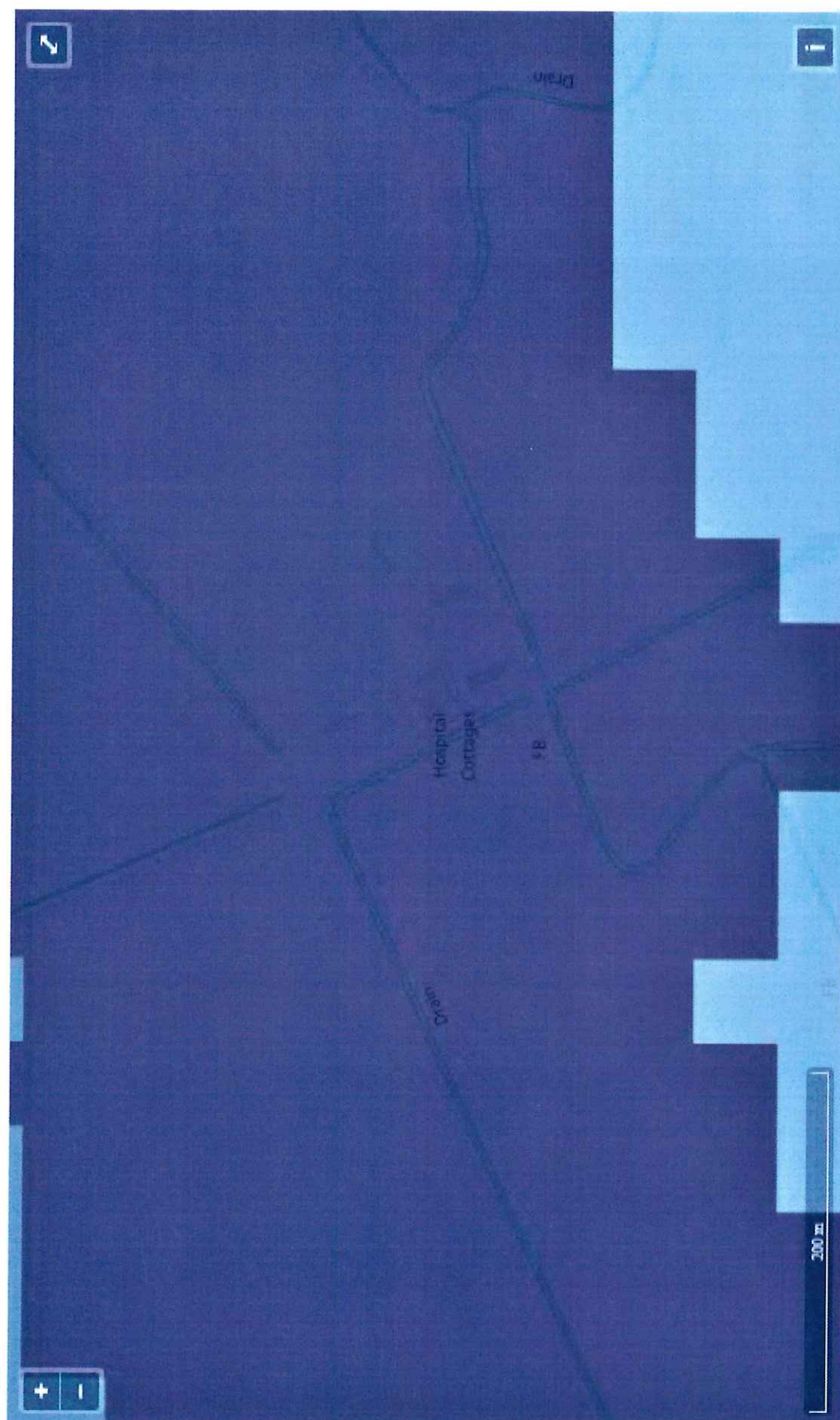
Dark blue shows the area that could be affected by flooding, either from rivers or the sea, if there were no flood defences. This area could be flooded:

- from the sea by a flood that has a 0.5% (1 in 200) or greater chance of happening each year.
- or from a river by a flood that has a 1% (1 in 100) or greater chance of happening each year.

Light blue shows the extent of the Extreme Flood Outline, which represents the extent of a flood event with a 0.1% chance of occurring in any year, or the highest recorded historic extent if greater.

These two colours show the extent of the natural floodplain if there were no flood defences or certain other manmade structures and channel improvements. Sites outside the two extents, but behind raised defences, may be affected by flooding if the defences are overtopped or fail.

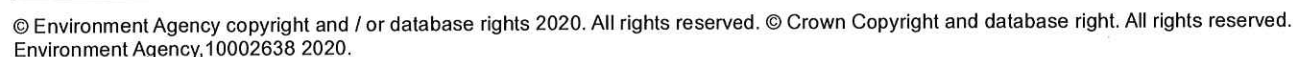
Created by the Partnerships and Strategic Overview Team, Kettering



Extent of flooding from rivers or the sea

● High ● Medium ● Low ● Very low

Environment
Agency



East Coast and Wash: Immingham to the West Lighthouse

2018 Coastal Flood Boundary Extreme Sea Levels



CFB REF	LOCATION	EASTING	NORTHING	ANNUAL CHANCE (1 IN X) OF TIDE LEVEL IN METRES ODN											
				1			10			50			100		
				Confidence Bound			Confidence Bound			Confidence Bound			Confidence Bound		
				2.5%	50%	97.5%	2.5%	50%	97.5%	2.5%	50%	97.5%	2.5%	50%	97.5%
3888	Immingham	520440	417625	4.16	4.17	4.19	4.50	4.53	4.62	4.73	4.80	5.00	4.83	4.93	5.19
3890	Haborough Marsh	522100	416512	4.14	4.15	4.17	4.48	4.51	4.60	4.70	4.77	4.97	4.80	4.90	5.16
3898	Grimsby	529295	413162	3.98	3.99	4.01	4.31	4.34	4.43	4.53	4.60	4.80	4.61	4.71	4.97
3906	Buck Beck	534709	407369	3.87	3.88	3.90	4.19	4.23	4.31	4.41	4.50	4.68	4.50	4.61	4.86
3910	Tetney	538035	405537	3.85	3.86	3.89	4.17	4.22	4.30	4.40	4.50	4.67	4.49	4.61	4.86
3918	Donna Nook	544641	401997	3.82	3.83	3.86	4.14	4.19	4.27	4.38	4.48	4.65	4.47	4.60	4.85
3928	Saltfleet	549131	393360	3.78	3.79	3.82	4.11	4.16	4.26	4.36	4.46	4.64	4.47	4.59	4.86
3942	Boygriff	555131	380860	3.72	3.74	3.77	4.06	4.11	4.22	4.33	4.43	4.65	4.43	4.57	4.87
3968	Gibraltar Point	557652	356181	4.16	4.17	4.20	4.51	4.56	4.67	4.76	4.85	5.08	4.85	4.97	5.27
3992_14	Hobhole	535990	340116	4.96	4.97	5.01	5.40	5.44	5.56	5.66	5.76	5.98	5.78	5.90	6.20
	Grand Sluice*	532366	344510	4.93	4.94	4.98	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3
3992_9	Boston Barrier	532754	342852	4.93	4.94	4.98	5.41	5.45	5.57	5.73	5.83	6.05	5.85	5.97	6.27
3992_5	Fosdyke Bridge	531886	332234	4.87	4.88	4.92	5.31	5.35	5.47	5.58	5.68	5.90	5.71	5.83	6.13
4008	West Lighthouse	550094	329971	4.87	4.88	4.91	5.21	5.26	5.37	5.46	5.56	5.78	5.56	5.68	5.98
-	Marsh Road	525988	324065	-	5.04	-	-	5.44	-	-	5.73	-	-	5.85	-
-	Wisbech	546110	309940	-	4.83	-	-	5.25	-	-	5.53	-	-	5.66	-
-	Dog-in-a-Doublet	527200	299287	-	3.67	-	-	4.00	-	-	4.22	-	-	4.32	-

See next page for notes

East Coast and Wash: Immingham to the West Lighthouse

2018 Coastal Flood Boundary Extreme Sea Levels

NOTES:

The following notes apply to all CFB sites (ie all on table excluding Marsh Road, Wisbech, Dog-in-a-Doulet)

- The base date for the data is 2017.
- The levels are still water levels. Depending on the use of the data it may be necessary to consider wave heights and / or joint probability analysis of water level and other variables.
- Levels for other annual chance probabilities are available if required.
- For additional information relating to the 2018 Coastal Flood Boundary Extreme Sea Levels or to access the full dataset for the above sites or intermediate locations refer to the Defra Metadata Catalogue at <https://deframetadata.com/geonetwork/srv/eng/catalog.search#/metadata/84a5c7c0-d465-11e4-b0bd-f0def148f590>

The following notes apply to all Marsh Road, Wisbech, Dog-in-a-Doulet

- The base date for the data is 2006
- The levels are still water levels. Depending on the use of the data it may be necessary to consider wave heights and / or joint probability analysis of water level and other variables.
- Levels for other annual chance probabilities are available if required.
- These levels will be updated as their respective tidal river models are updated.

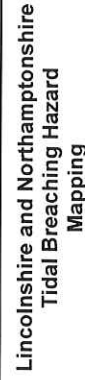
The following notes apply to Grand Sluice

- The data is based on CFB 2018 data for Boston Barrier site, capped at 5.3mAOD to reflect use of the barrier.
- The base date for the data is 2017
- The levels are still water levels. Depending on the use of the data it may be necessary to consider wave heights and / or joint probability analysis of water level and other variables.
- For additional information relating to the 2018 Coastal Flood Boundary Extreme Sea Levels or to access the full dataset for the above sites or intermediate locations refer to the Defra Metadata Catalogue at <https://deframetadata.com/geonetwork/srv/eng/catalog.search#/metadata/84a5c7c0-d465-11e4-b0bd-f0def148f590>

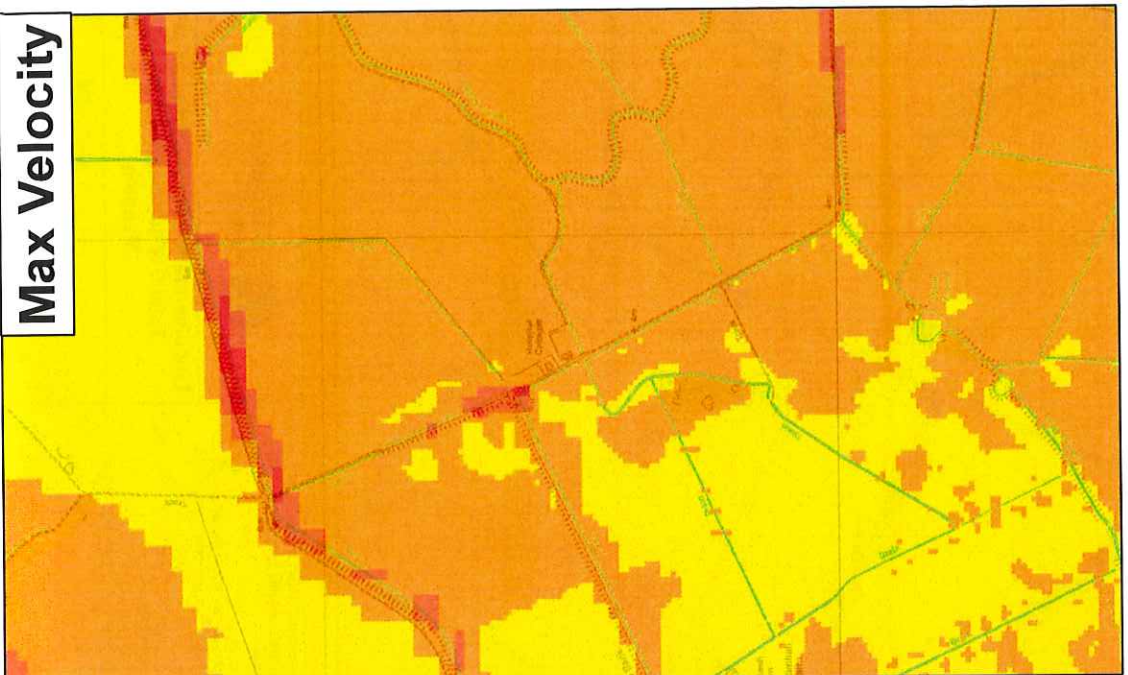
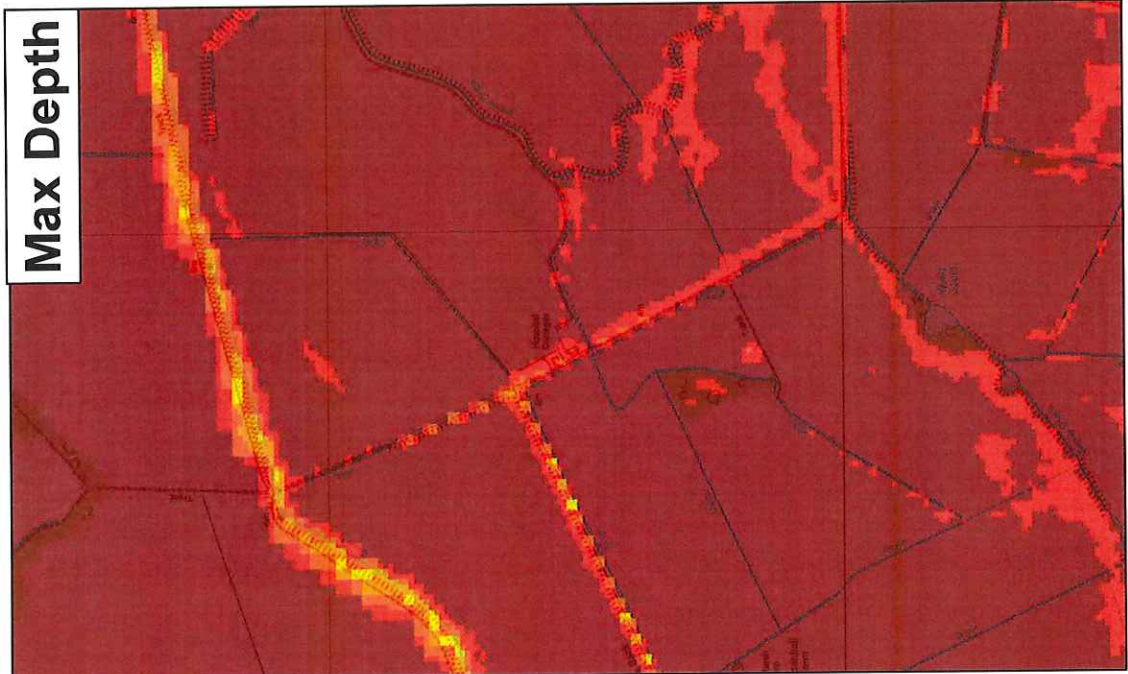
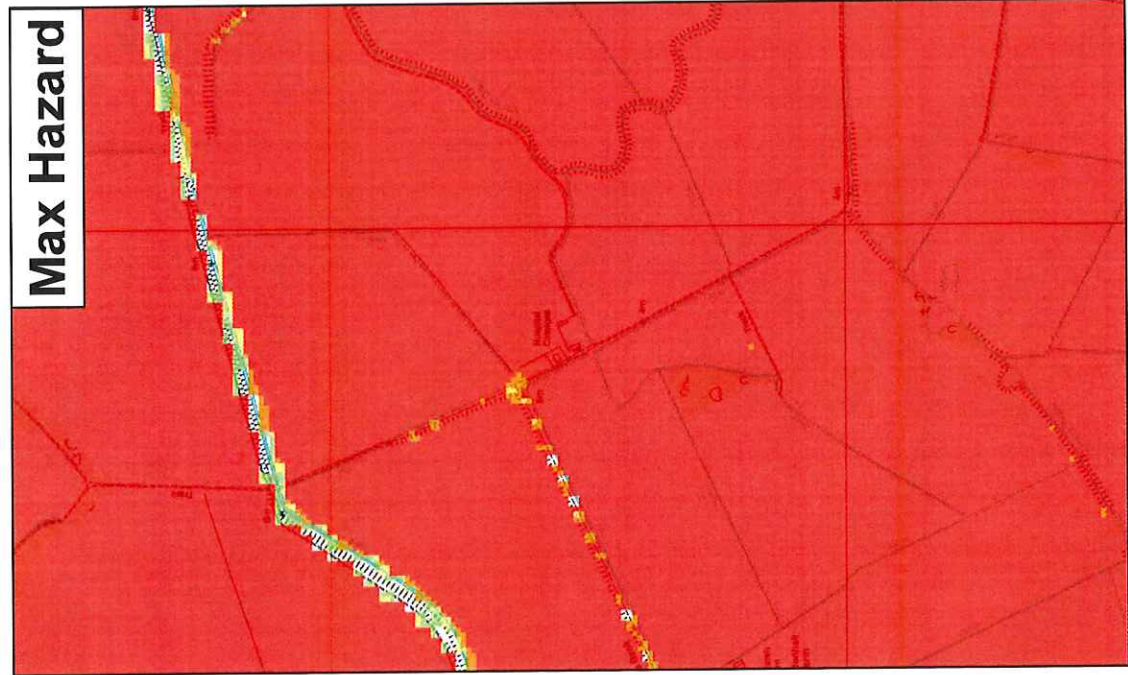
A map titled "Max Hazard" showing a geographical area with a grid overlay. The map features a large red area on the left, a yellow area on the right, and a central orange area. A network of roads is shown, with some roads marked with red diamonds. A river or stream flows through the center of the map. The map is labeled with "Max Hazard" in the top left corner.

Max Hazard (Flood Risk to People : FD2320)		Max Depth (m)	Max Velocity (m/s)	Scenario year	2006	Scenario Annual Chance (1 in 1000)	CCN Number	CCN-2020-178046
	Less than 0.75 (Low Hazard)			August 2020		0.1%		
	Between 0.75 and 1.25 (Danger for Some)							
	Between 1.25 and 2.0 (Danger for Most)							
	Greater than 2.0 (Danger for All)							

General Enquiries No: 03708 506 506. Weekday Daytime calls cost 5p plus up to 6p per minute from BT Weekend Unlimited. Mobile and other providers' charges may vary



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★ Modelled Breach Locations - see also the accompanying plan "Location of Modelled Breaches"

Date Printed	Scenario year	Scenario Annual Chance	Max Depth (m)	Max Velocity (m/s)	CCN Number	CCN-2020-178046
August 2020	2115	0.1% (1 in 1000)	Less than 0.75 (Low Hazard) Between 0.75 and 1.25 (Danger for Some) Between 1.25 and 2.0 (Danger for Most) Greater than 2.0 (Danger for All)	0 - 0.3 0.3 - 1.0 1.0 - 1.5 1.5 - 2.5 2.5 +		

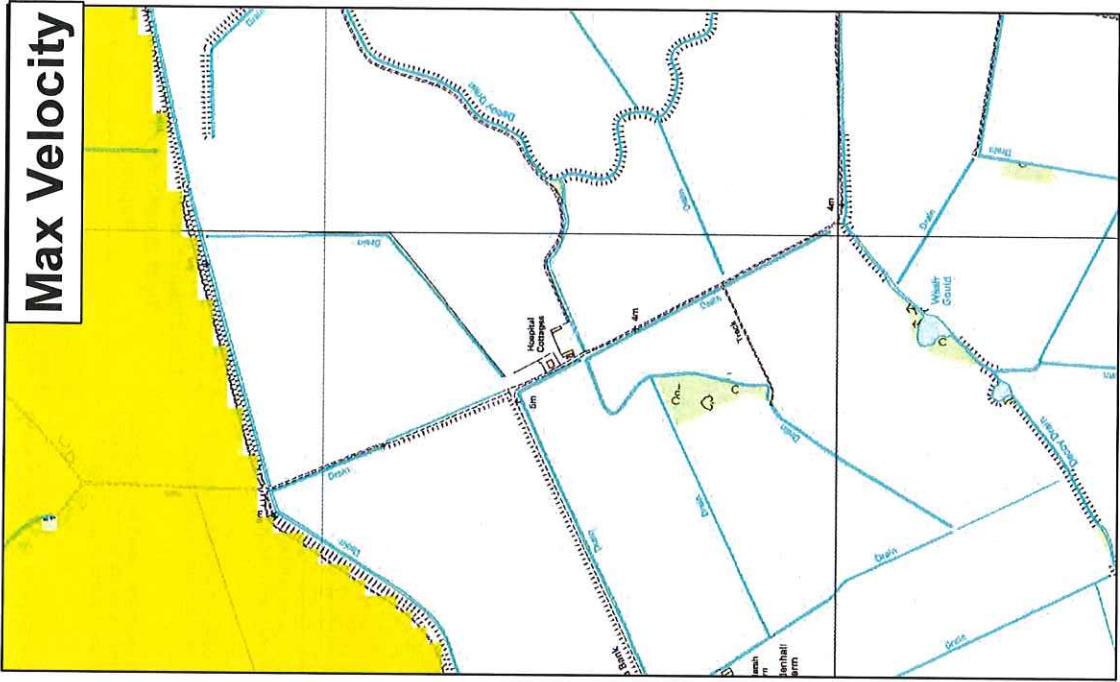
This map shows the level of flood hazard to people (called a hazard rating) if our flood defences are breached at certain locations, for a range of scenarios. The hazard rating depends on the depth and velocity of floodwater, and maximum values of these are also mapped.

The map is based on computer modelling of simulated breaches at specific locations. Each breach has been modelled individually and the results combined to create this map. Multiple breaches, other combinations of breaches, different sized tidal surges or flood flows may all give different results.

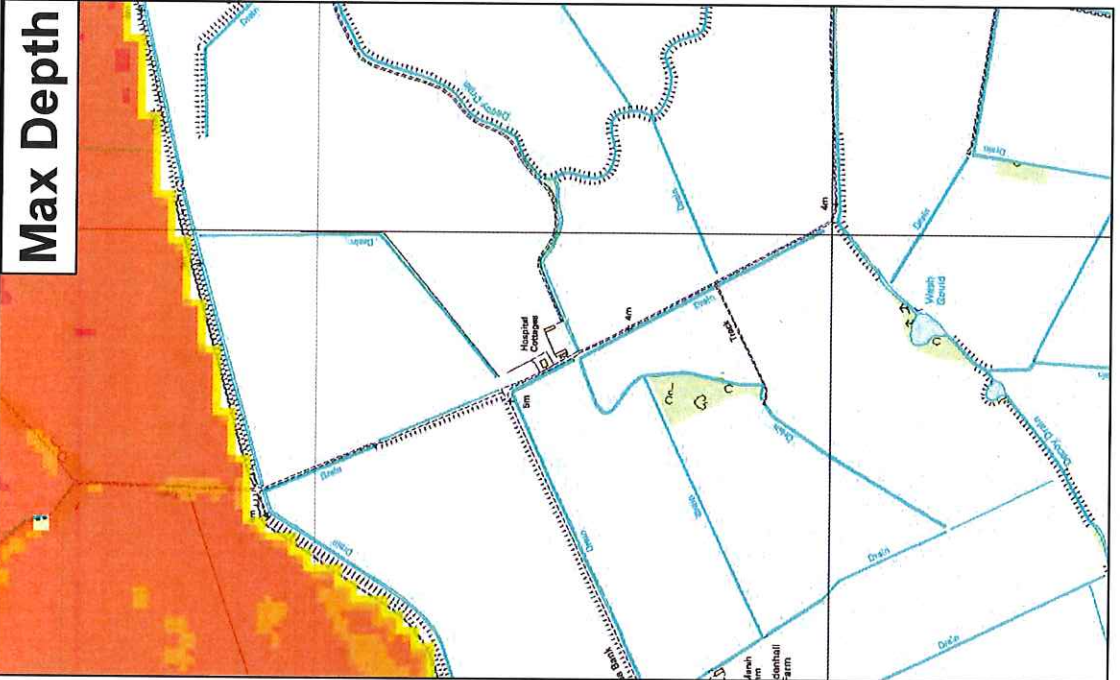
The map only considers the consequences of a breach, it does not make any assumption about the likelihood of a breach occurring. The likelihood of a breach occurring will depend on a number of different factors, including the construction and condition of the defences in the area. A breach is less likely where defences are of a good standard, but a risk of breaching remains.

General Enquiries No: 03708 506 506. Weekday Daytime calls cost 5p plus up to 6p per minute from BT Weekend Unlimited. Mobile and other providers' charges may vary.

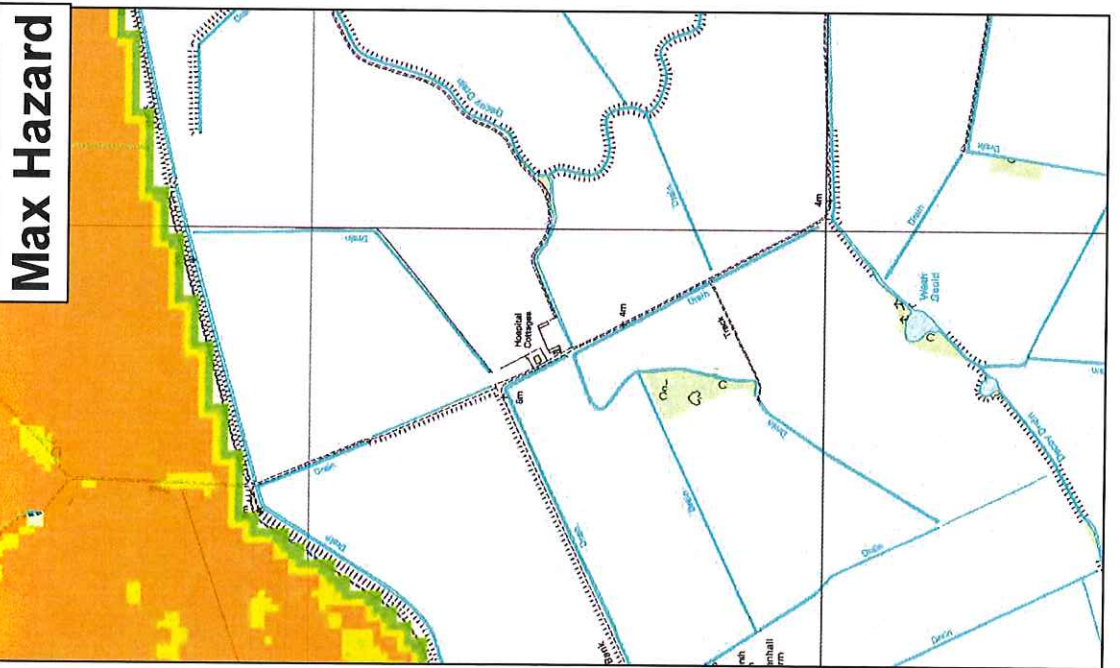
Max Velocity



Max Depth



Max Hazard



Lincolnshire and Northamptonshire
Tidal Overtopping Hazard
Mapping

Map Centred on TF 36790 33536

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Environment Agency 100020390, 2020. Unauthorised reproduction infringes
Crown copyright and may lead to prosecution or civil proceedings.

The map is based on computer modelling of simulated overtopping of the main coastal defences for specific tidal scenarios. It does not include overtopping along the following tidal rivers which are currently being investigated: Witham Haven (upstream of Hobhole), and Welland (upstream of Fosdyke Bridge)

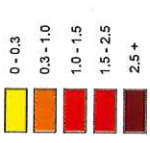
The map only considers the consequences of overtopping of the defences, and does not show the possible consequences of breaches of the tidal defences. Separate maps of the flood extent from just breaching of the defences are available.

For future climate change scenarios it is assumed that defences remain at 2006 heights.

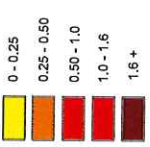
These maps do not replace the flood zone maps used in the National Planning Policy Framework (NPPF)

General Enquiries No: 03708 506 506. Weekday Daytime calls cost 5p plus up to 6p per minute from BT Weekend Unlimited. Mobile and other providers' charges may vary

Max Velocity (m/s)



Max Depth (m)

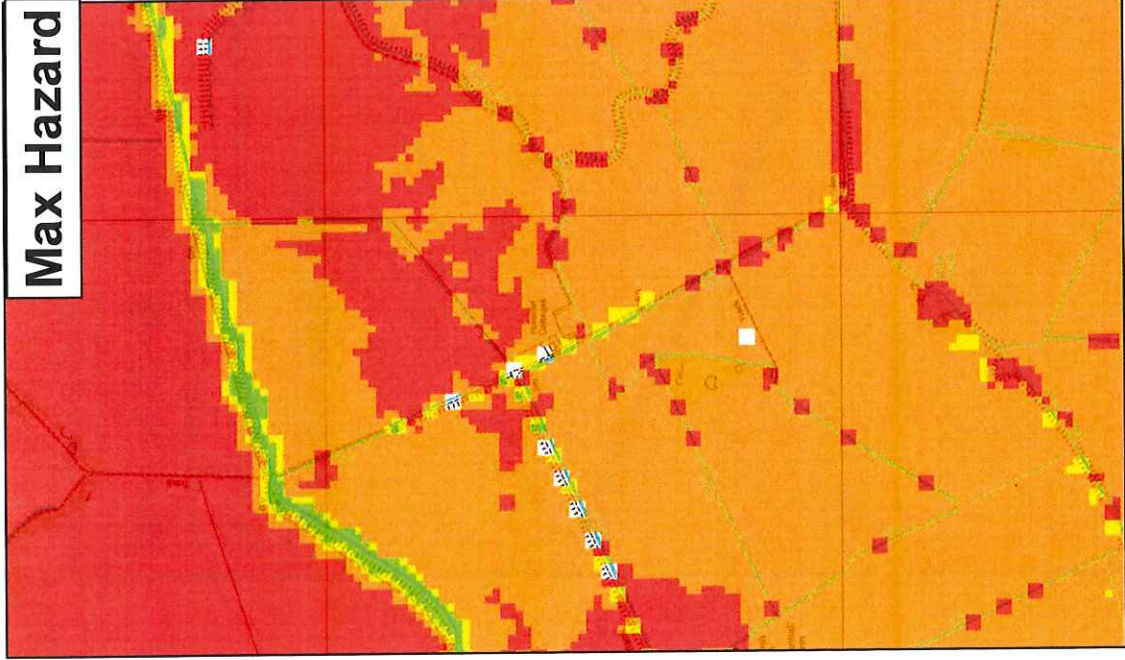


Max Hazard

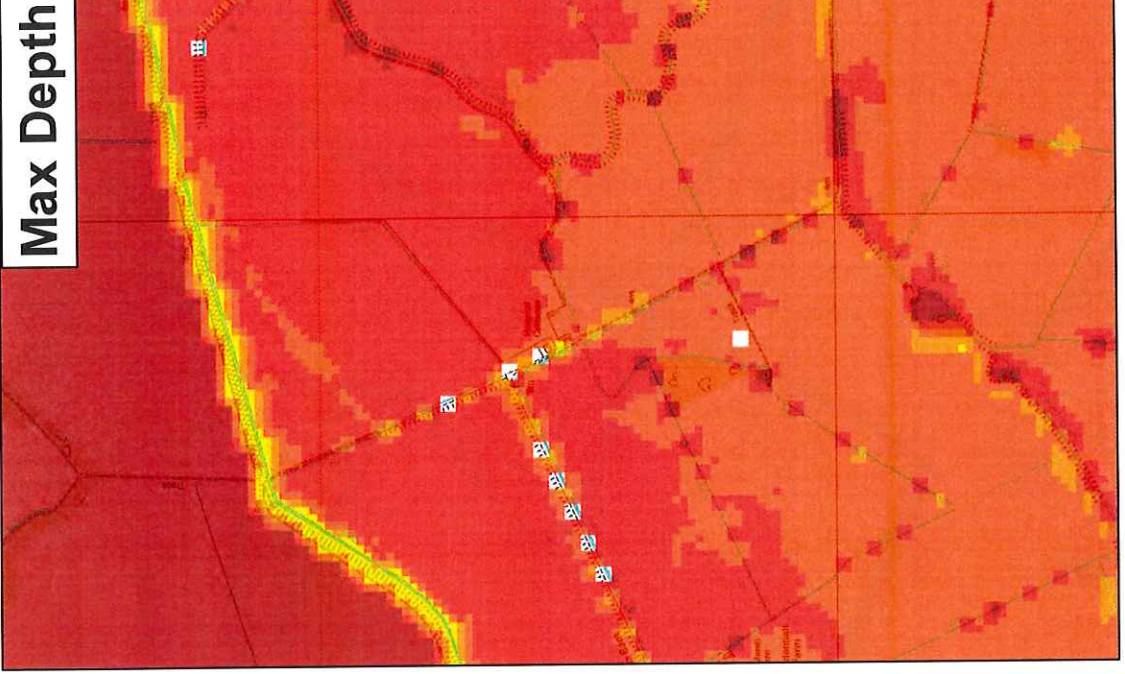


Date Printed	Scenario year	Scenario Annual Chance	CCN Number	CCN-2020-178046
August 2020	2115	0.1% (1 in 1000)		

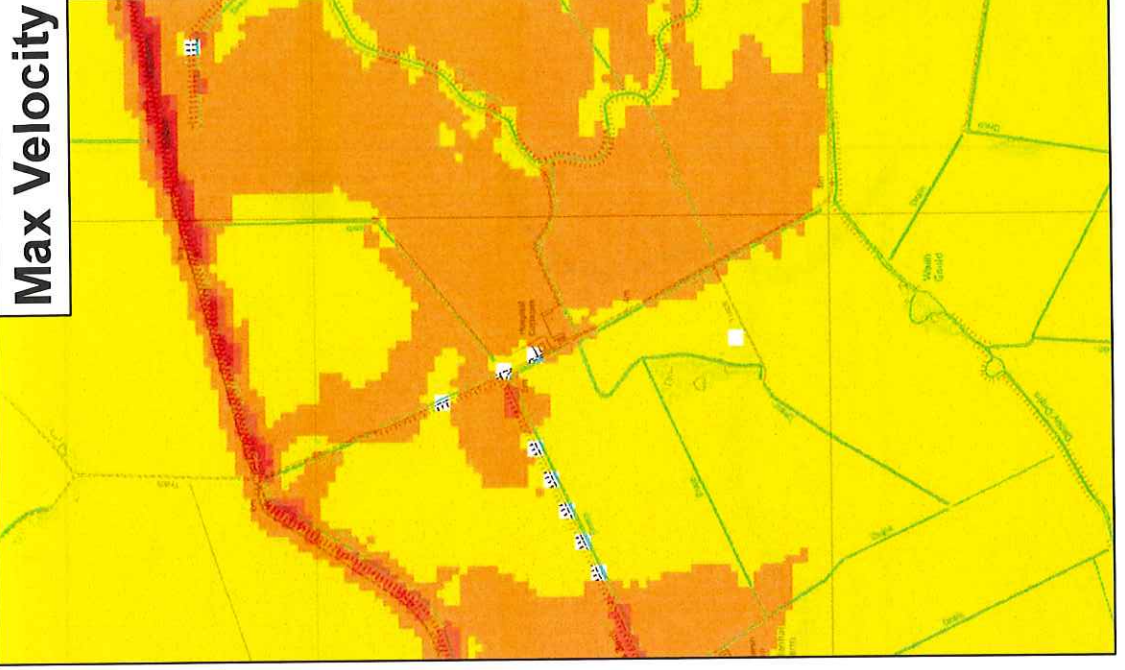
Max Hazard



Max Depth



Max Velocity



Date Printed	August 2020	Scenario year	2115	Scenario Annual Chance	0.1% (1 in 1000)	CCN Number	CCN-2020-178046
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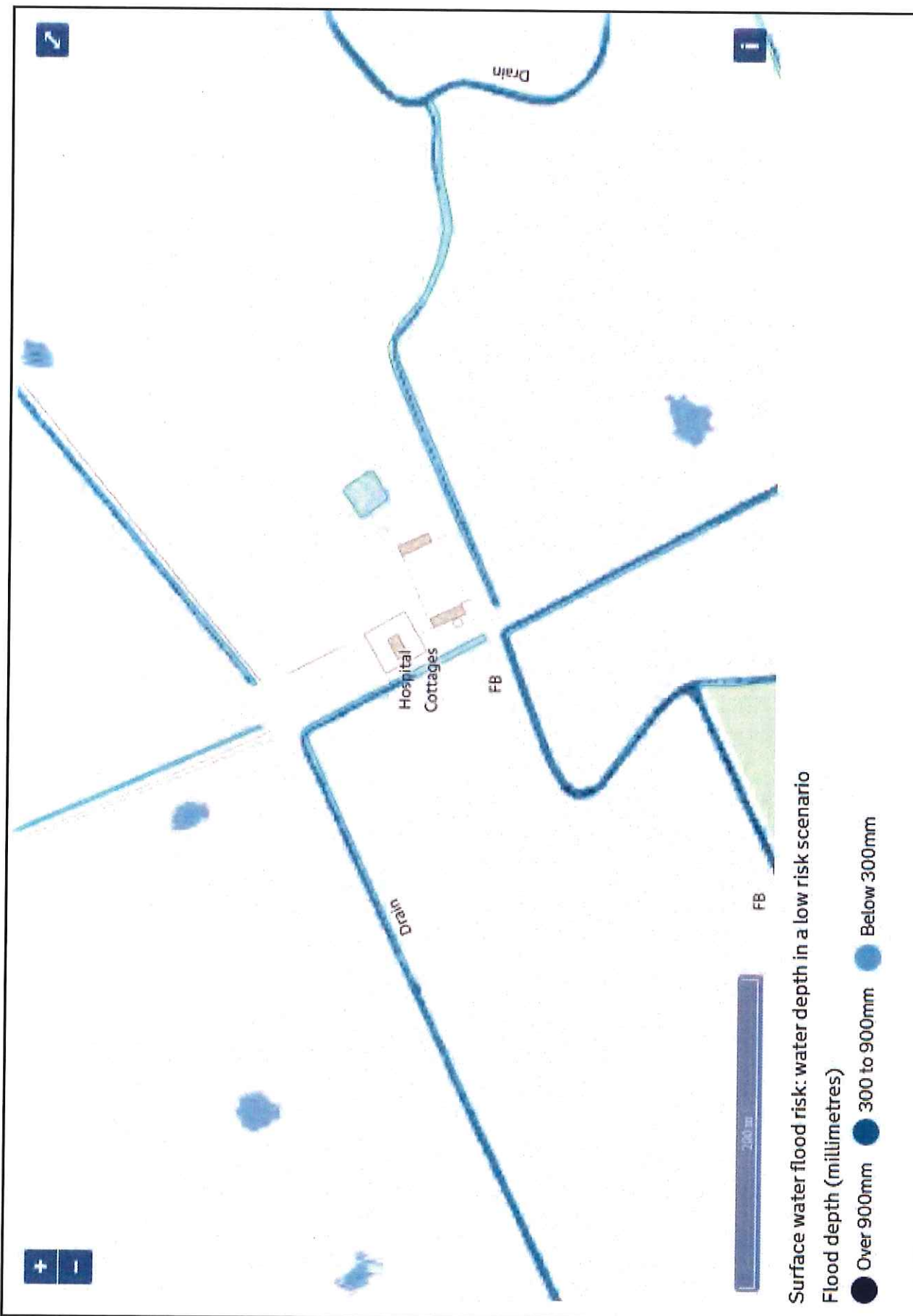
The map is based on computer modelling of simulated overtopping of the main coastal defences for specific tidal scenarios. It does not include overtopping along the following tidal rivers which are currently being investigated: Witham Haven (upstream of Hobhole), and Welland (upstream of Fosdyke Bridge)

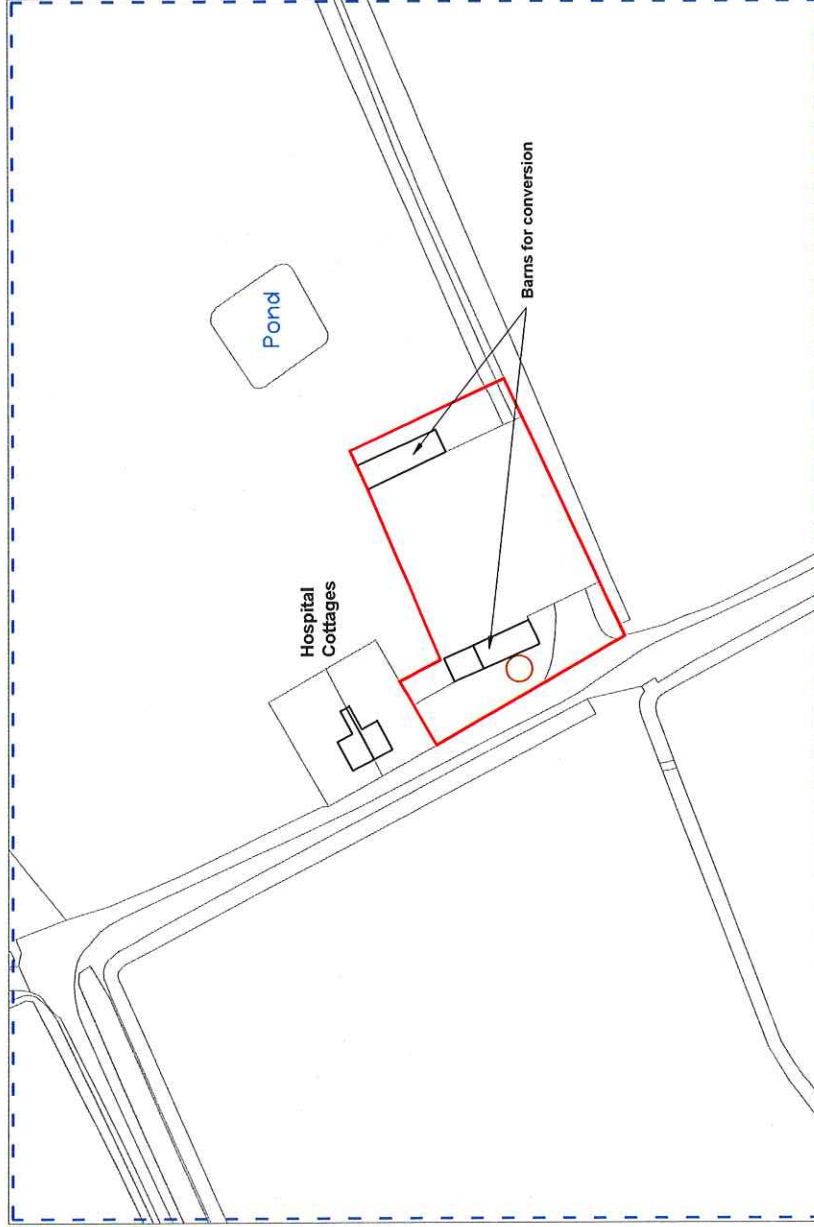
The map only considers the consequences of overtopping of the defences, and does not show the possible consequences of breaches of the tidal defences. Separate maps of the flood extent from just breaching of the defences are available.

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General Enquiries No. 03708 506 506. Weekday Daytime calls cost 5p plus up to 6p per minute from BT Weekend Unlimited. Mobile and other providers' charges may vary





LEGEND

- Outline of Application Site
- Other land owned by applicant
(dashed line indicates land owned
extends beyond boundary of map)

guyforman
ARCHITECT

Guy Forman BA (Hons) MArch

tel 07958 188257

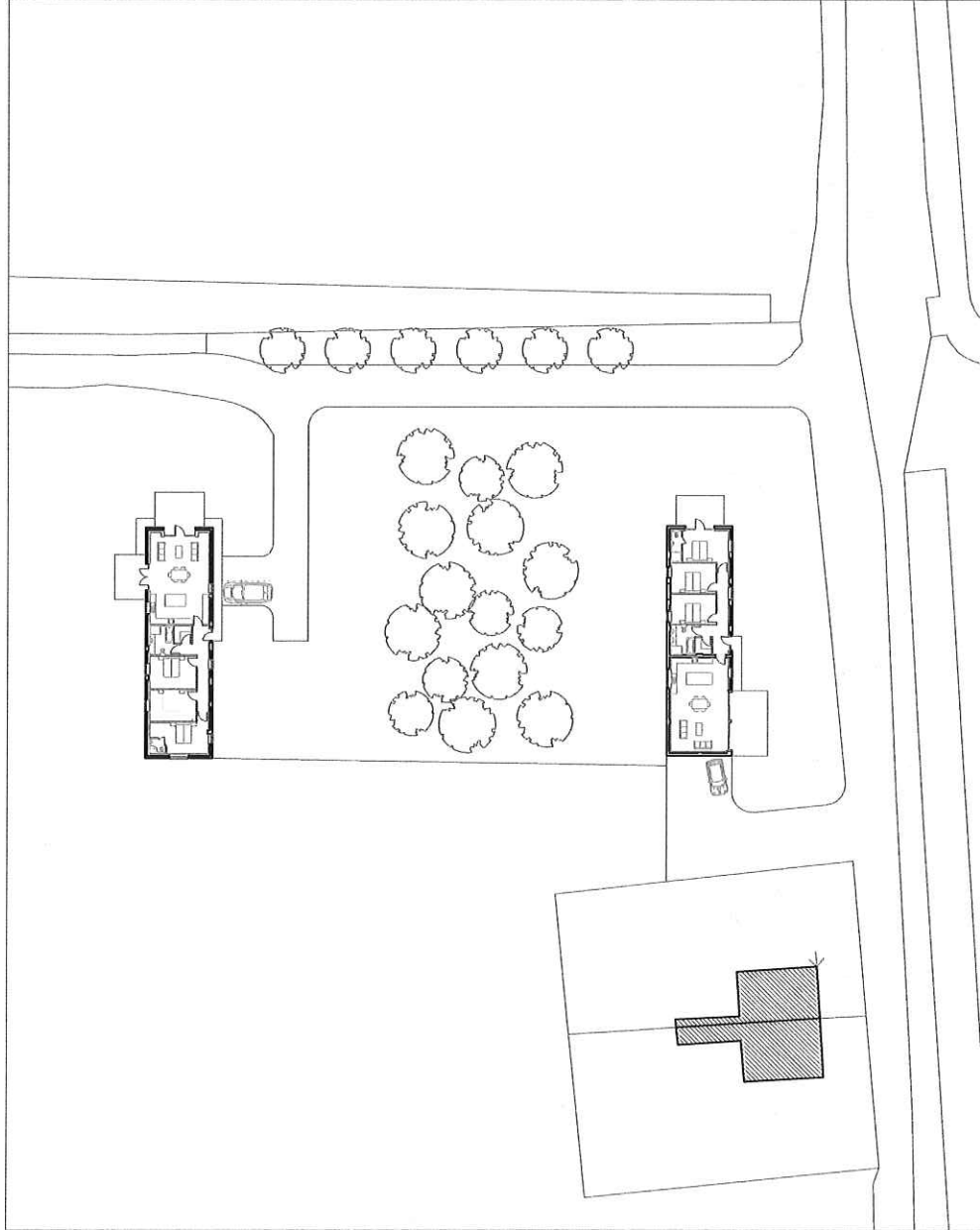
Leadenhall Farm Barns at Hospital Cottages

Site Location Plan (2 of 2)

For Information

Rev	Description	Date	By	Chk
Scale: 1:1250 @ A3				
Drawn: GF		Date: 17/06/20		Checked: GF
Drawing No.: 408-PLN-E-01		Rev:		DRFT

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guyforman
ARCHITECT

Guy Forman BA (Hons) MArch
tel 07958 188257

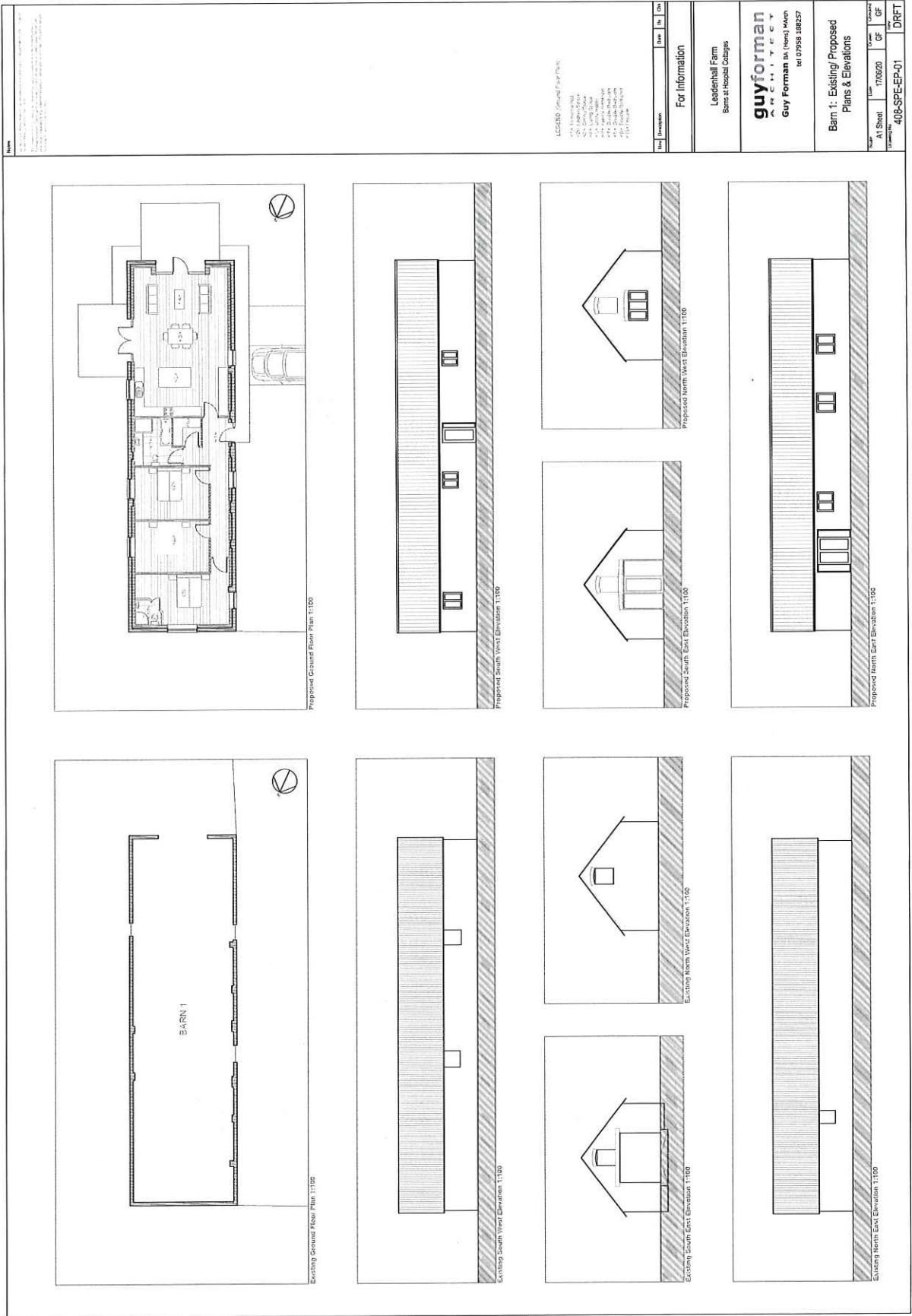
Leadenhall Farm
Barns at Hospital Cottages

Proposed Site Plan

For Information

Rev	Description	Date	By	Chk
Scale:	1:500 @ A3	Date:	17/06/20	
Drawn:	GF	Checked:	GF	GF
Revised:				
Drawing No.:	408-PLN-P-01			
				DRFT

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Notes

1. All dimensions are to the centre of the wall unless otherwise stated.

2. The ground level is as shown on the site plan.

3. The proposed building is to be constructed of brick with a tiled roof.

4. The proposed building is to be constructed to a minimum of 10 years warranty.

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For Information

Leidenhall Farm

Barns at Hospital College

guyforman

architects

Guy Forman (a. (New) York

tel 07958 388257

Barn 1: Existing/Proposed

Plans & Elevations

Rev

At Sheet

Rev

Rev

Rev

Rev

Rev

Rev

Rev

Rev

Rev

Rev

Rev

Rev

Rev

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Fig. 1. The effect of the concentration of the monomer on the rate of polymerization. The reaction was carried out at 40°C in benzene solution.

- **Individuals**
 - **Children**
 - **Young Adults**
 - **Adults**
 - **Elderly**
- **Groups**
 - **Family**
 - **Community**
 - **Workplace**
 - **Religious**
 - **Political**
 - **Professional**
- **Settings**
 - **Home**
 - **Workplace**
 - **Community**
 - **Healthcare**

Time	Duration in hours	Cost	Est.	6
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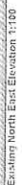
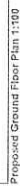
Leadenhall Farm
Barns at Hospital Cottages

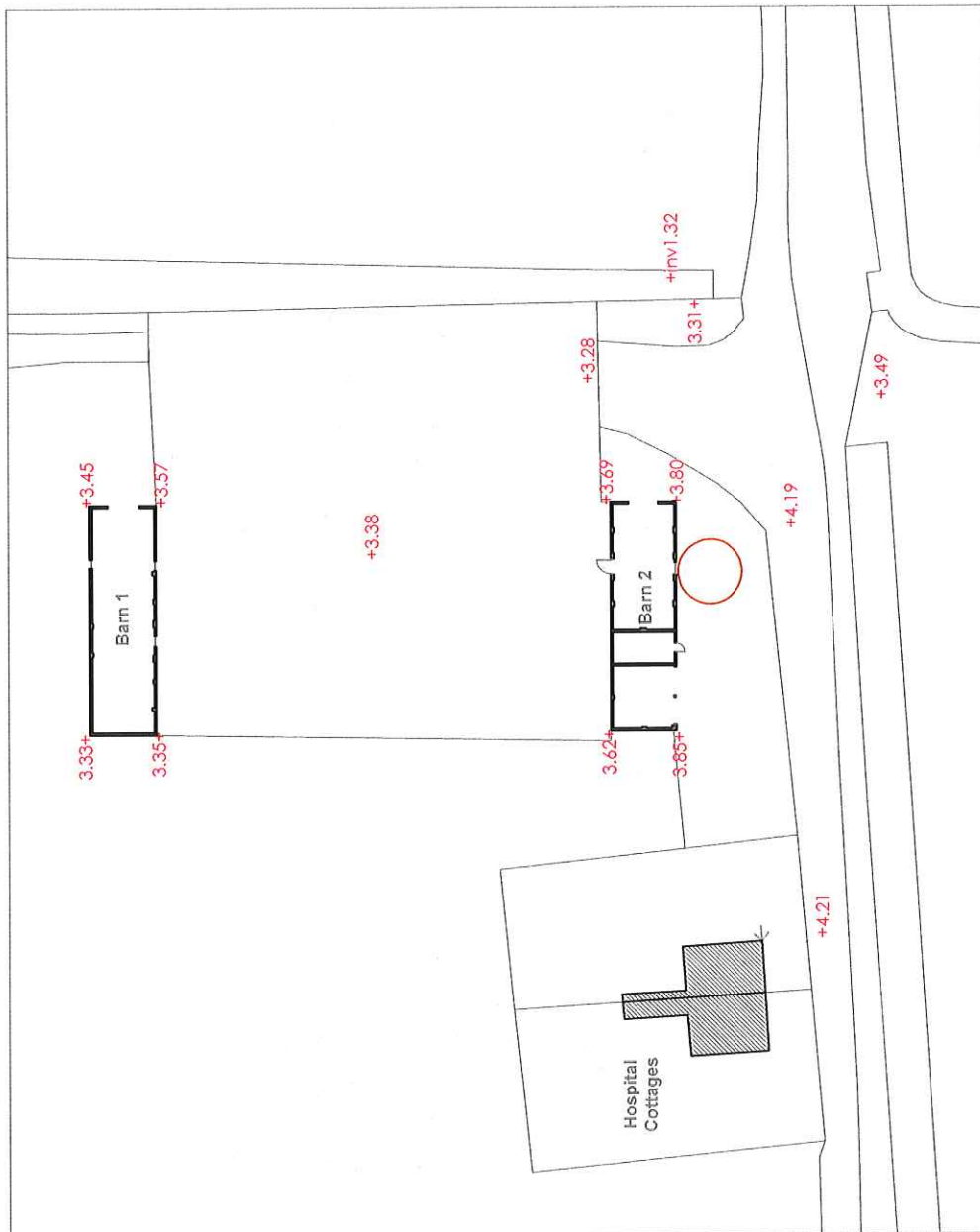
guyforman
ARCHITECT
Guy Forman BA (Hons) MArch
tel 07958 188257

Barn 2: Existing/ Proposed
Plans & Elevations

Score	Date	Unseen	Checked
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408-SPE-EP-02	How DRF:
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LEGEND

+3.31 Lidar 2m DTM levels

— Outline of Application Site

— Other land owned by Applicant

Rev		Description	Date	By	Chk
For Information					
Scale:	1:500 @ A3	Date:	17/06/20	Drawn:	GF
Checked:				GF	
Drawing No.:	408-PLN-E-02	Rev:			DRFT

guyforman
ARCHITECT

Guy Forman BA (Hons) MArch
tel 07958 188257

Leadenhall Farm
Barns at Hospital Cottages

Existing Site Plan

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