FLOOD RISK ASSESSMENT

PROPOSED CHANGE OF USE OF OFFICES TO RESIDENTIAL
FOUR WINDS
3, TYDD LOW ROAD
LONG SUTTON
PE12 9AR



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RMA

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FLOOD RISK ASSESSMENT FOR CHANGE OF USE OF OFFICES TO RESIDENTIAL FOUR WINDS, 3, TYDD LOW ROAD, LONG SUTTON PE12 9AR

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 Four Winds 3, Tydd Low Road, Long Sutton, PE12 9AR, within the administrative area of South Holland District Council. The National Grid Reference is TF42892 20747. **Plan 1**

This flood risk assessment has been prepared for a planning application for the change of use of two storey building present use as offices back to the original residential use. **Plans 2, 3,4 & 5**

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 10 dwellings.

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 present use for the site is classified as “Less Vulnerable” and the proposed use is “More Vulnerable” Table 1 of NPPG states that such uses are permitted in this zone, subject to the exceptions test.

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 building average 3.00mODN and the ground floor level for the building is sone 225mm higher. The road level on Tydd Low Road is 2.72mODN **Plan 2**

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 Nene
- Wash Estuary

The River Nene lies some 3.7km to the south of the site and the Wash some 8.7km 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 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 Low risk of flooding. **Low risk** means that each year this area has a chance of flooding of between 0.1% and 1%.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 Environment Agency has confirmed that the site is not affected by flooding from a Main River and therefore it would only be affected by tidal flooding. The tidal defences 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 good 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.

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.

Breach Analysis to the 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 West Lighthouse for the 50% confidence bound 0.1% (1 in 200year) = 5.82mODN

Higher Central Peak tide levels (2120) at West Lighthouse for the 0.1% (1 in200) = 5.82mODN 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 x (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 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 100-year event, shows that building is not within a Hazard rating area.

With climate change up to year 2115 the maps show that for Scenario annual chance 1 in 100-year that Building is still not in a Hazard rating area.

Map 4 shows the Hazard Rating for the present day and **Map 5** shows the results for Hazard Rating, Depth, & Velocity, for year 2115, scenario annual chance 1 in 100, 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 years 2006 & 2020 the site is not affected.

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 EA Hazard maps confirm the maps contained within the SHDC SFRA, and the Environment Agency maps have been used in this assessment.

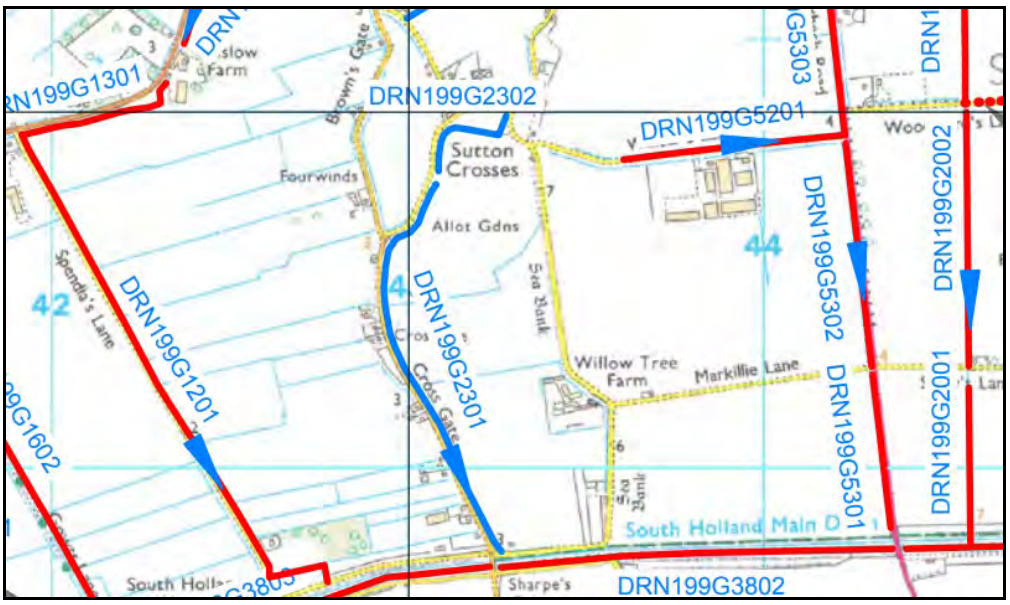
SOUTH HOLLAND INTERNAL DRAINAGE BOARD

The site 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 'H' Free Discharge (C) Catchment**.** The Board has a watercourse to the south of

the site Ref DRN199G2301 (Kinewereham Drain) which outfalls at South Holland main Drain



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 above the existing ground 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 overloading 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 6**

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 change of use to 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 to2039)	Total potential change anticipated for '2050s' (2040 to2069)	Total potential change anticipated for '2080s' (2070 to2115)
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 1981to 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 West lighthouse 0.5% (1 in 200) = 5.82mODN and for year 2120 = 6.85mODN.

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 West lighthouse 0.5% (1 in 200) = 5.82mODN and for year 2120 = 7.19mODN.

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 2006 – 2025 @ 4mm/year (19 years x 4mm) = 76mm
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 = **1174mm**

Peak tide levels Present Day (2017) at West Lighthouse 0.5% (1 in 200) = 5.82mODN and for year 2115 Higher Central) = 6.99mODN

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 foul drainage will continue to be connected to the existing facility which has served the office for many years without giving rise to any problems.

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 ground floor of the building will remain at the same level as existing. And all sleeping is located at first floor level which provides a safe haven for the residents.

- 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.

- The existing property is 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 residential use 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 the floor level for the residential use remains at the existing level as the hazard maps show that this to be above the 1 in 200 breach flood level for year 2115.

- The risk of flooding from Rivers and Sea Map shows that the site is at a Low risk of flooding. **Low risk** means that each year this area has a chance of flooding of between 0.1% and 1%.

- 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 for planning

Your reference	Location (easting/northing)	Created
Tydd Low Road	**542883/320741**	**10 Dec 2020 11:07**

Your selected location is in flood zone 3, an area with a high probability of flooding.

This means:

- you must complete a flood risk assessment for development in this area
- you should follow the Environment Agency's standing advice for carrying out a flood risk assessment (see www.gov.uk/guidance/flood-risk-assessment-standing-advice)

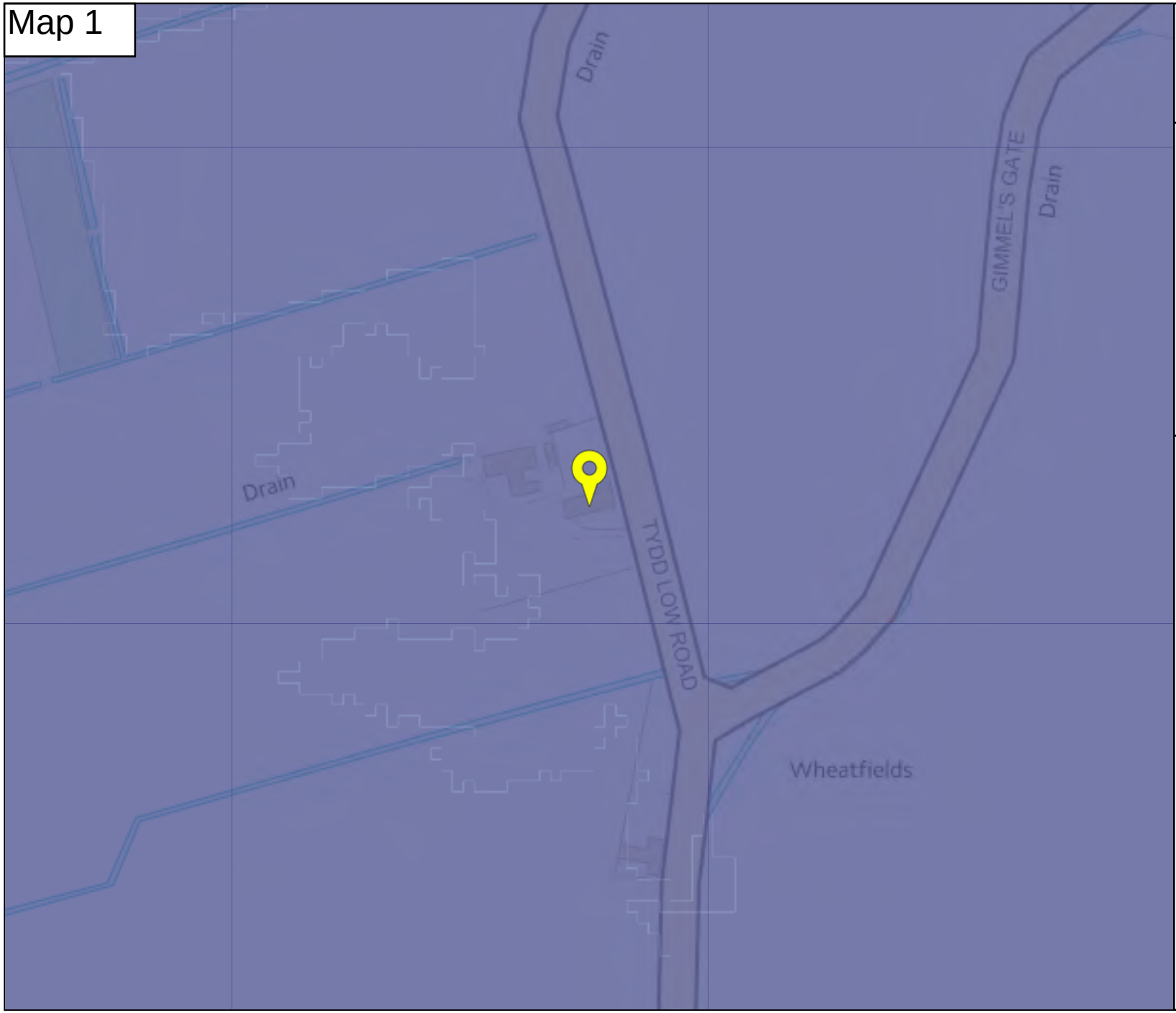
Notes

The flood map for planning shows river and sea flooding data only. It doesn't include other sources of flooding. It is for use in development planning and flood risk assessments.

This information relates to the selected location and is not specific to any property within it. The map is updated regularly and is correct at the time of printing.

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Map 1



Environment Agency

Flood map for planning

Your reference
Tydd Low Road

Location (easting/northing)
542883/320741

Scale
1:2500

Created
10 Dec 2020 11:07

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

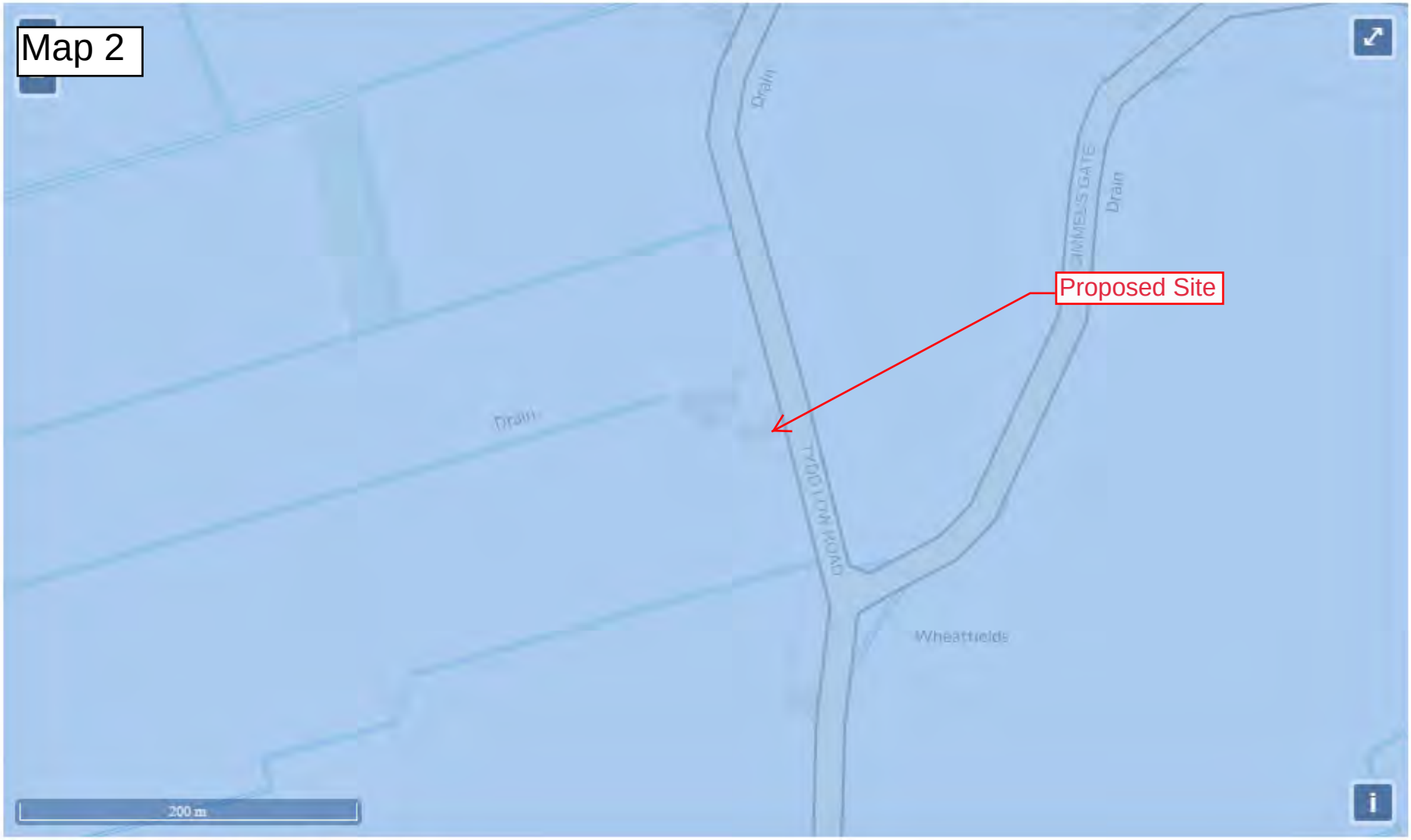
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Flood risk

Extent of flooding

Location

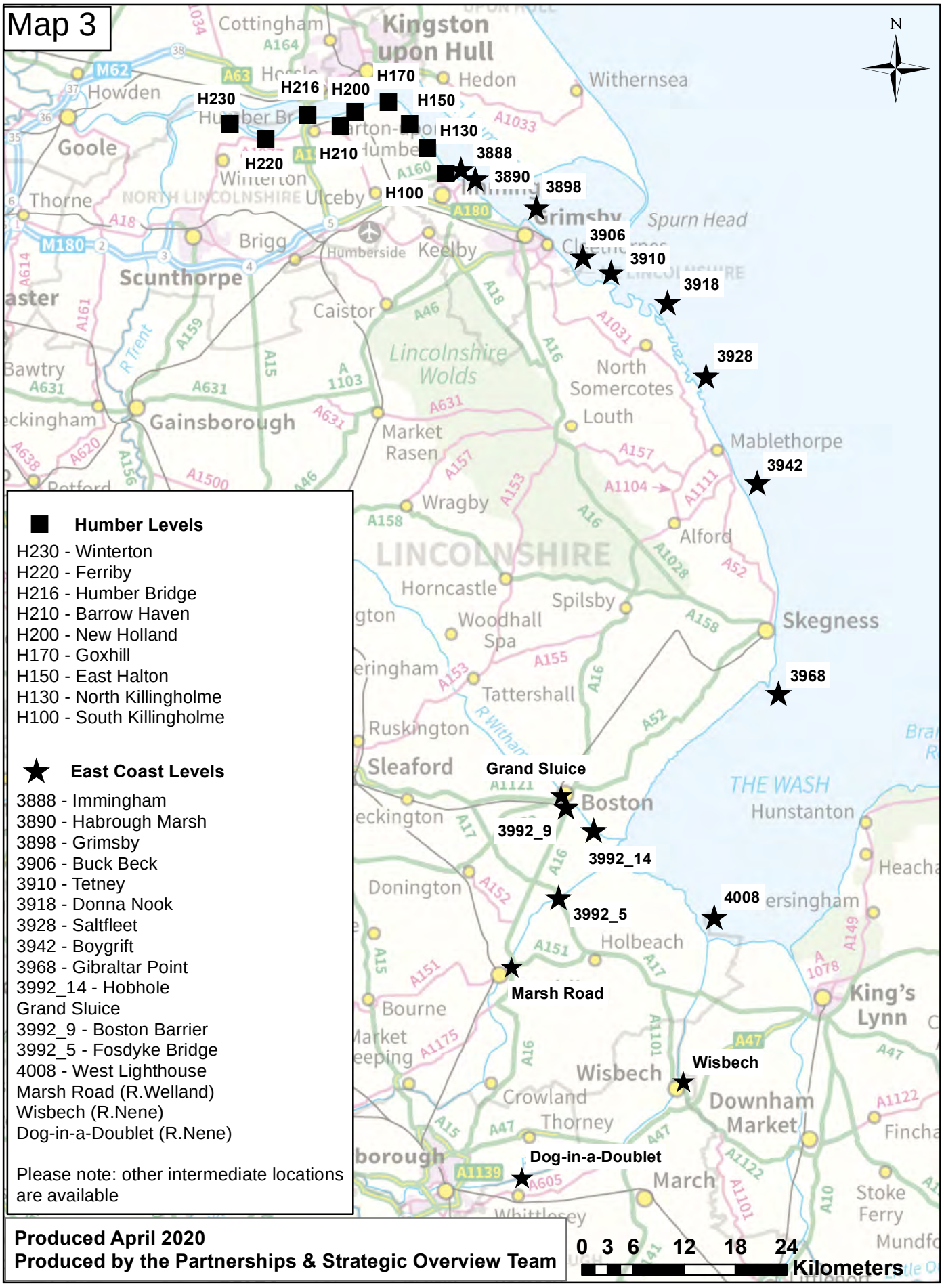


Extent of flooding from rivers or the sea

High Medium Low Very low

Tidal Level Location Map
Lincolnshire & Northamptonshire Area

Environment Agency



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Humber Estuary

2014 Interim Water Level Profile

Ref	Location	Easting	Northing	Annual Chance (1 in x) of Tide Level metres ODN																			
				1			10			50			100			200			300			1000		
				Confidence Bound			Confidence Bound			Confidence Bound			Confidence Bound			Confidence Bound			Confidence Bound			Confidence Bound		
				5%	50%	95%	5%	50%	95%	5%	50%	95%	5%	50%	95%	5%	50%	95%	5%	50%	95%	5%	50%	95%
H230	**Winterton**	493420	422830	5.13	5.14	5.15	5.47	5.51	5.56	5.67	5.74	5.82	5.74	5.83	5.92	5.81	5.90	6.00	5.84	5.94	6.03	5.94	6.02	6.06
H220	**Ferriby**	497550	421150	5.03	5.04	5.05	5.38	5.42	5.47	5.59	5.67	5.77	5.67	5.77	5.89	5.74	5.86	6.00	5.78	5.91	6.06	5.91	6.04	6.19
H216	**Humber Bridge**	502478	423914	4.97	4.98	4.99	5.33	5.37	5.42	5.55	5.64	5.74	5.64	5.75	5.88	5.72	5.86	6.02	5.75	5.92	6.10	5.88	6.09	6.31
H210	**Barrow Haven**	506380	422620	4.91	4.92	4.93	5.27	5.31	5.36	5.50	5.60	5.72	5.60	5.73	5.89	5.69	5.86	6.08	5.74	5.94	6.18	5.87	6.17	6.51
H200	**New Holland**	508020	424330	4.86	4.87	4.88	5.21	5.26	5.31	5.45	5.55	5.67	5.55	5.68	5.84	5.64	5.81	6.03	5.68	5.89	6.13	5.82	6.12	6.47
H170	**Goxhill**	511970	425440	4.66	4.67	4.68	5.00	5.04	5.09	5.24	5.34	5.46	5.33	5.47	5.65	5.43	5.61	5.85	5.47	5.69	5.96	5.62	5.95	6.37
H150	**East Halton**	514450	422870	4.58	4.59	4.60	4.91	4.96	5.01	5.15	5.25	5.38	5.25	5.39	5.57	5.34	5.53	5.77	5.39	5.62	5.90	5.54	5.89	6.33
H130	**North Killingholme**	516530	420000	4.50	4.51	4.52	4.82	4.87	4.92	5.05	5.15	5.28	5.15	5.28	5.46	5.24	5.42	5.66	5.29	5.51	5.78	5.43	5.77	6.19
H100	**South Killingholme**	518700	417120	4.41	4.41	4.42	4.72	4.77	4.82	4.95	5.05	5.17	5.05	5.18	5.35	5.14	5.32	5.55	5.18	5.40	5.67	5.33	5.66	6.08
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	4.93	5.06	5.41	4.98	5.14	5.55	5.15	5.38	6.01

NOTE:

- The base date for the data is 2014.
- 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.
- The information is due to be updated in mid-2020
- *The levels for Immingham are taken from the 2018 Coastal Flood Boundary dataset.

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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			200			300			1000		
				Confidence Bound			Confidence Bound			Confidence Bound			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%	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	4.93	5.06	5.41	4.98	5.14	5.55	5.15	5.38	6.01
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	4.90	5.03	5.38	4.94	5.10	5.51	5.11	5.34	5.97
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	4.71	4.84	5.19	4.74	4.90	5.31	4.88	5.11	5.74
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	4.61	4.75	5.10	4.64	4.82	5.22	4.80	5.05	5.66
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	4.60	4.75	5.10	4.63	4.82	5.21	4.80	5.06	5.66
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	4.58	4.74	5.10	4.63	4.82	5.22	4.81	5.08	5.68
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	4.57	4.74	5.11	4.63	4.83	5.25	4.83	5.11	5.74
3942	Boygrift	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	4.56	4.73	5.13	4.62	4.83	5.28	4.85	5.15	5.82
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	4.94	5.10	5.49	4.99	5.18	5.63	5.14	5.41	6.09
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	5.88	6.04	6.44	5.92	6.11	6.57	6.03	6.31	6.99
	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	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	5.93	6.09	6.49	5.94	6.13	6.59	5.98	6.26	6.94
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	5.82	5.98	6.38	5.87	6.06	6.52	6.01	6.29	6.97
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	5.66	5.82	6.21	5.71	5.90	6.35	5.86	6.14	6.81
-	Marsh Road	525988	324065	-	5.04	-	-	5.44	-	-	5.73	-	-	5.85	-	-	5.98	-	-	-	-	-	-	-
-	Wisbech	546110	309940	-	4.83	-	-	5.25	-	-	5.53	-	-	5.66	-	-	5.78	-	-	-	-	-	-	-
-	Dog-in-a-Doublet	527200	299287	-	3.67	-	-	4.00	-	-	4.22	-	-	4.32	-	-	4.42	-	-	-	-	-	-	-

See next page for notes

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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-Doublet)

- 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-Doublet

- 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

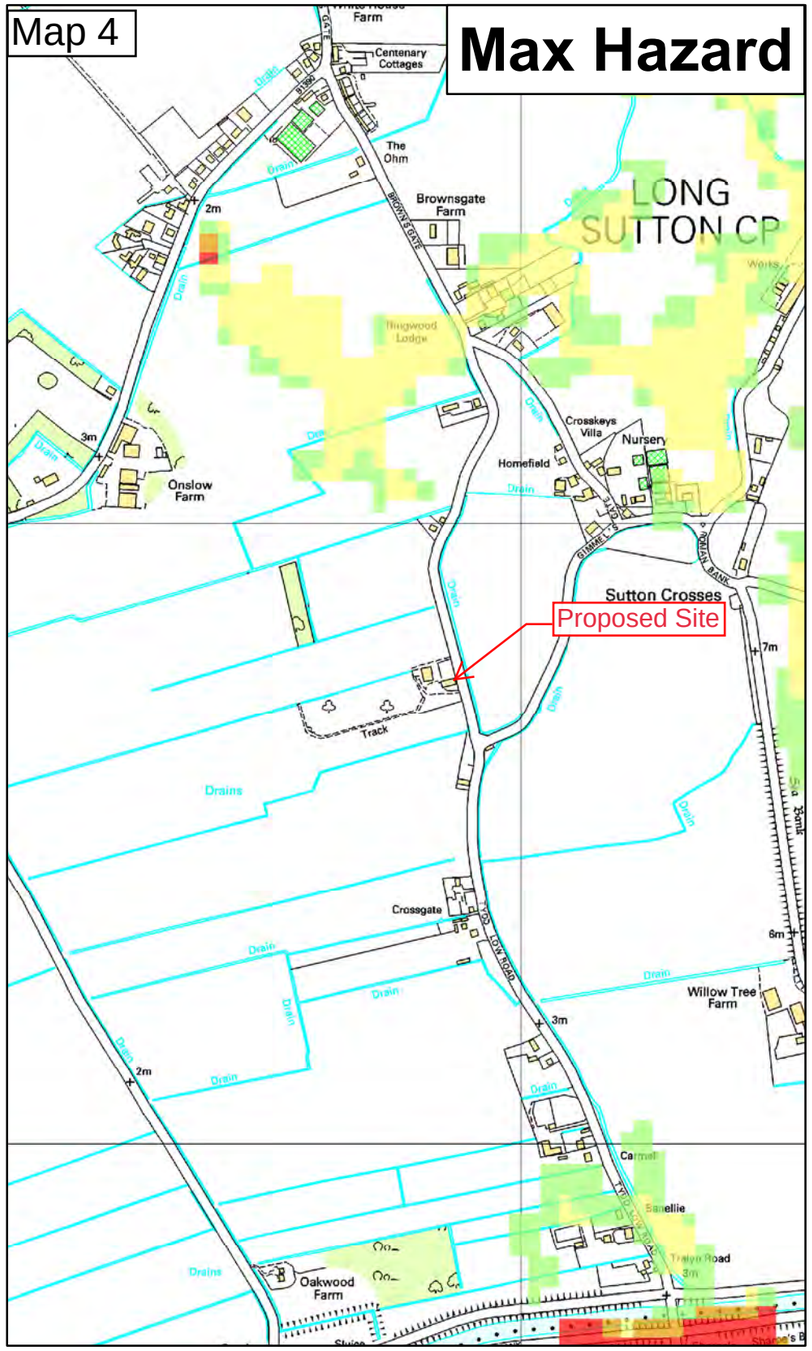
- The data is based on CFB 2018 data for Boston Barrier site, capped at 5.3mAOD to reflect use of the barrier.
- The base date for the data is 2017
- The levels are still water levels. Depending on the use of the data it may be necessary to consider wave heights and / or joint probability analysis of 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

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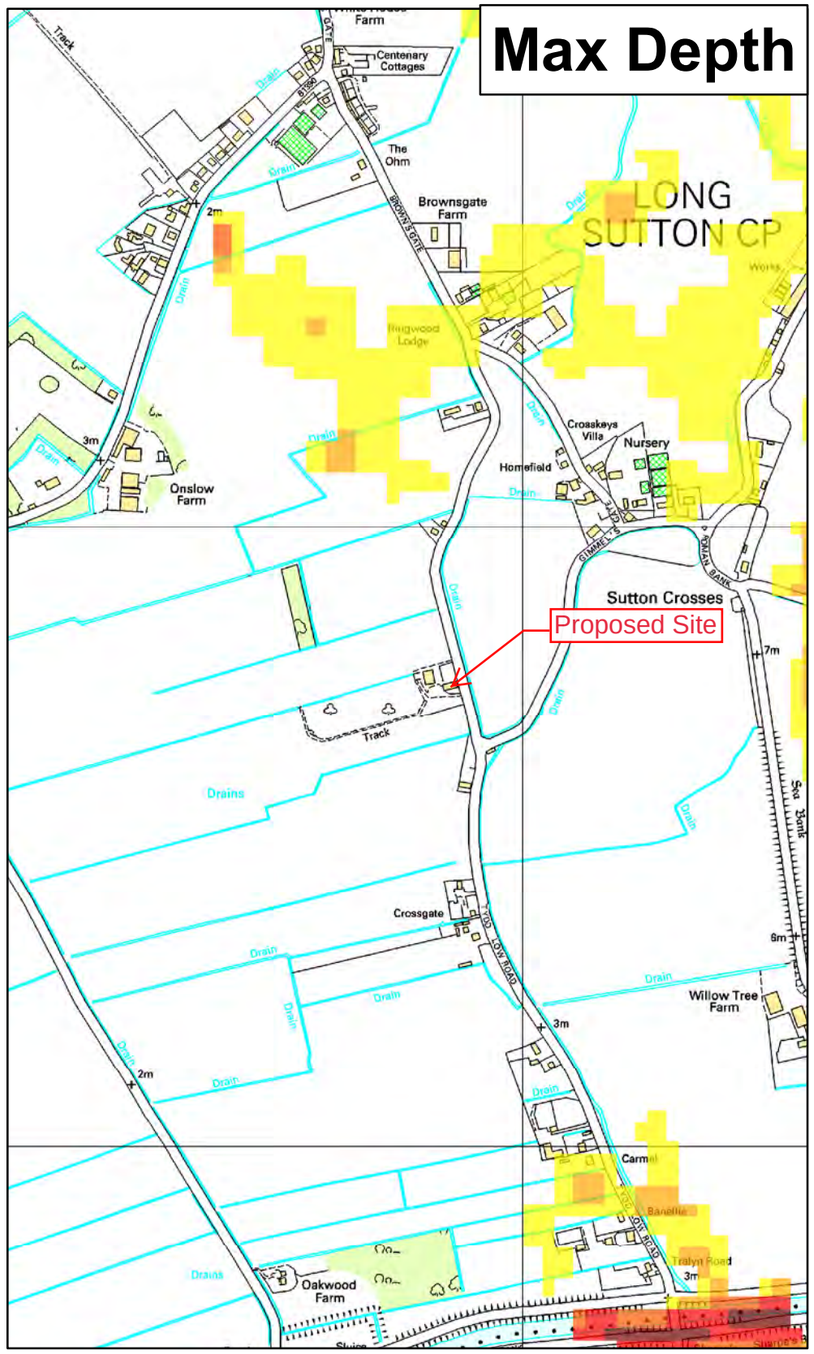
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Map 4

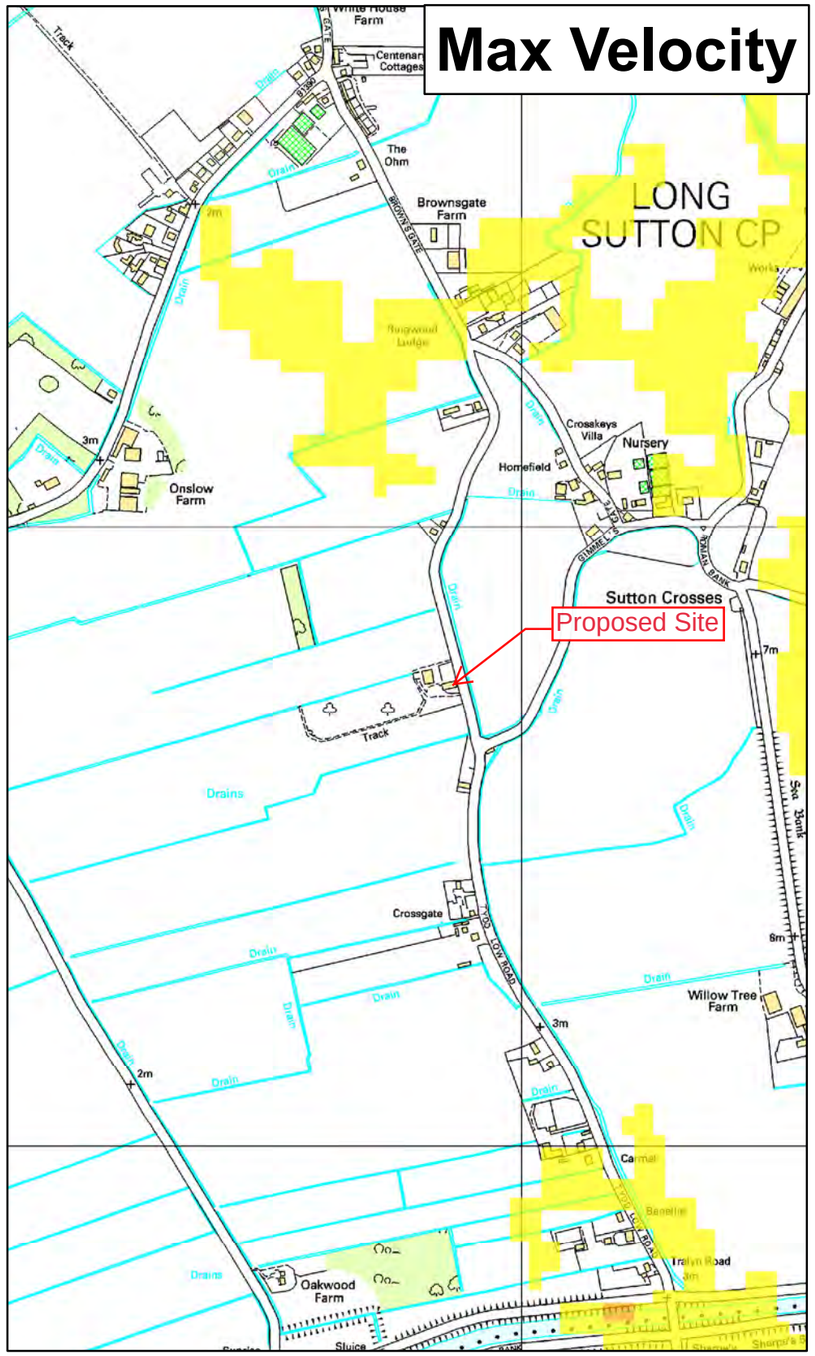
Max Hazard



Max Depth



Max Velocity



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

Max Hazard
(Flood Risk to People : FD2320)

- 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)

Max Depth (m)

- 0 - 0.25
- 0.25 - 0.50
- 0.50 - 1.0
- 1.0 - 1.6
- 1.6 +

Max Velocity (m/s)

- 0 - 0.3
- 0.3 - 1.0
- 1.0 - 1.5
- 1.5 - 2.5
- 2.5 +

Date Printed	November 2020	Scenario year	2006	Scenario Annual Chance	0.5% (1 in 200)	CCN Number	CCN-2020-191327

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

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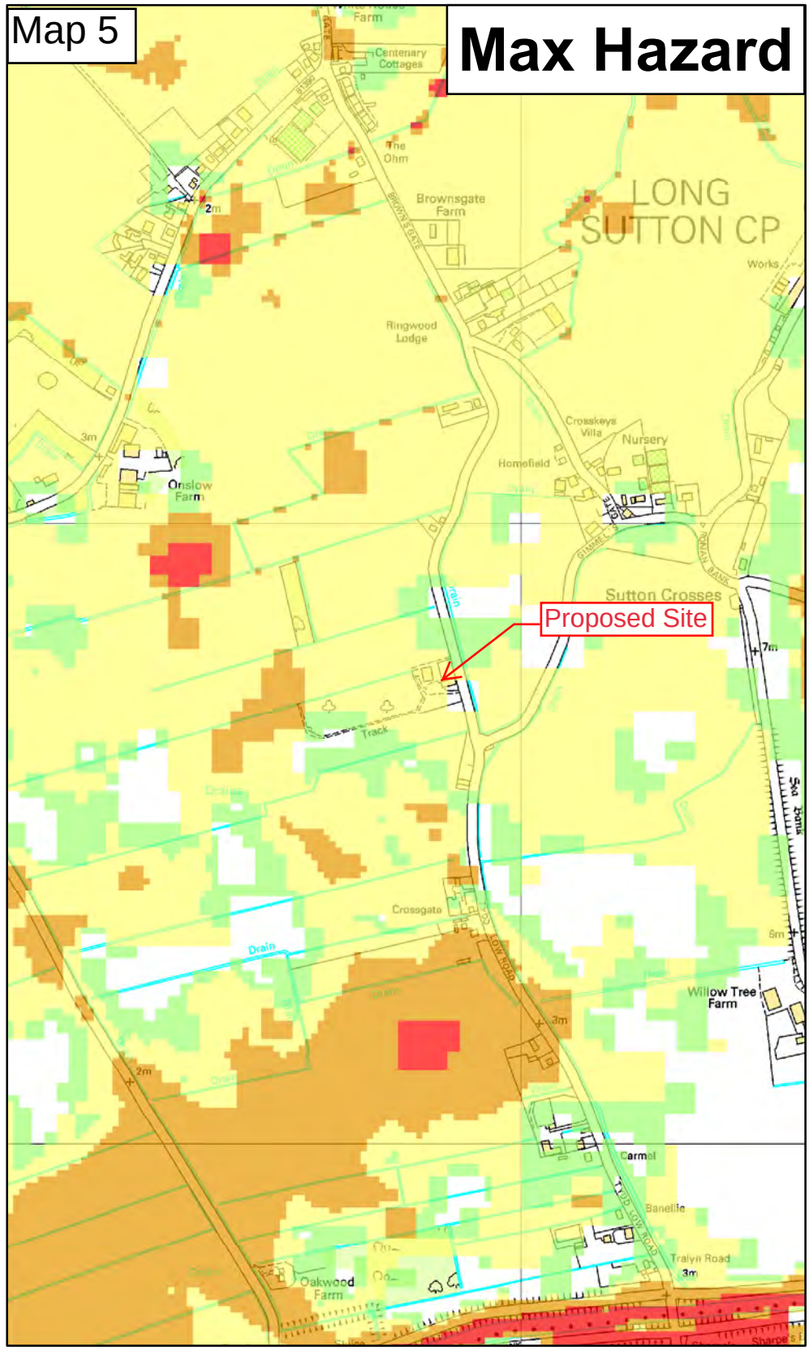
Lincolnshire and Northamptonshire Tidal Breaching Hazard Mapping

Map Centred on TF 42814 20754

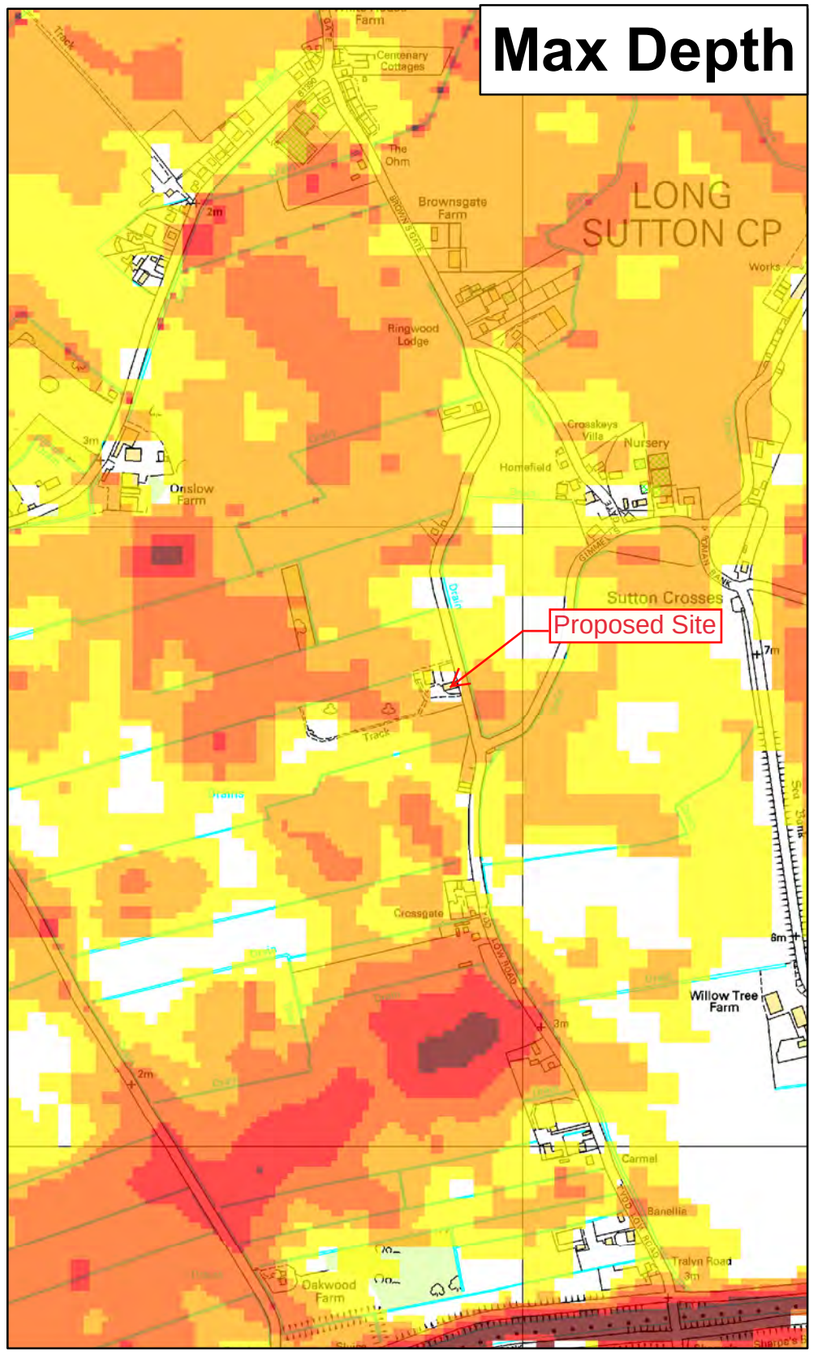
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Map 5

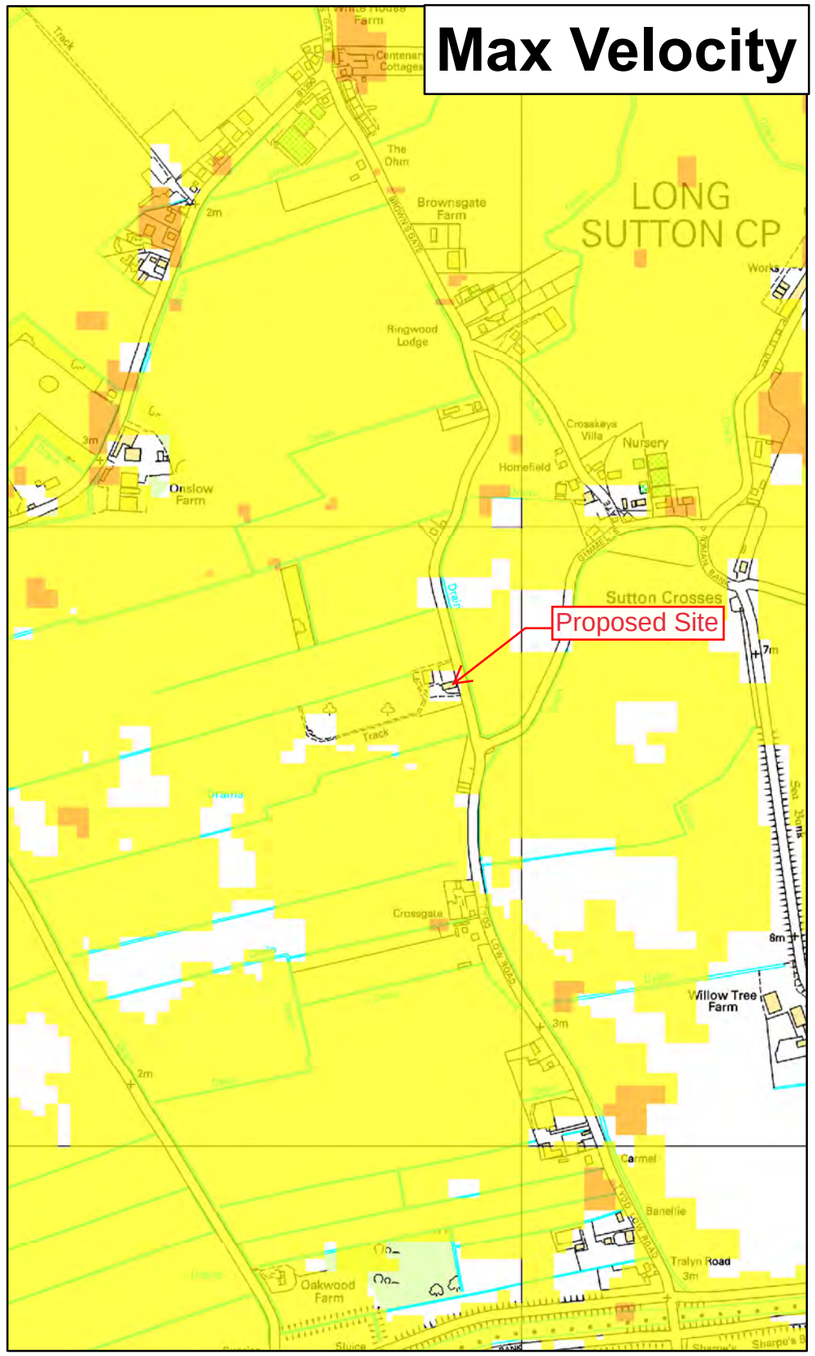
Max Hazard



Max Depth



Max Velocity



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

Max Hazard (Flood Risk to People : FD2320)	Max Depth (m)	Max Velocity (m/s)
Less than 0.75 (Low Hazard)	0 - 0.25	0 - 0.3
Between 0.75 and 1.25 (Danger for Some)	0.25 - 0.50	0.3 - 1.0
Between 1.25 and 2.0 (Danger for Most)	0.50 - 1.0	1.0 - 1.5
Greater than 2.0 (Danger for All)	1.0 - 1.6	1.5 - 2.5
	1.6 +	2.5 +

Date Printed	November 2020	**Scenario year**	2115	**Scenario Annual Chance**	0.5% (1 in 200)	**CCN Number**	CCN-2020-191327

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.

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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

Environment Agency

Lincolnshire and Northamptonshire Tidal Breaching Hazard Mapping

Map Centred on TF 42814 20754

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Flood risk

Low risk: depth

Location

Tydd Low Road

Map 6



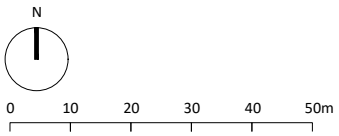
Surface water flood risk: water depth in a low risk scenario

Flood depth (millimetres)

Over 900mm | 300 to 900mm | Below 300mm

Plan 1





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Client
Mr & Mrs J Jeffs

Project
Change of Use
Four Winds, Long Sutton

Drawing
Location Plan

Scale @ A4	Date
1: 1250	30/09/20

Drawn By	Checked By
CH	PSS

Job Number	Status	Purpose of Issue
1425-1	PA	Pre-App

Drawing No.	Rev
1425-1_PA_LP01	-

Plan 2



N

0 10 20 30 40 50m

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Four Winds, Long Sutton

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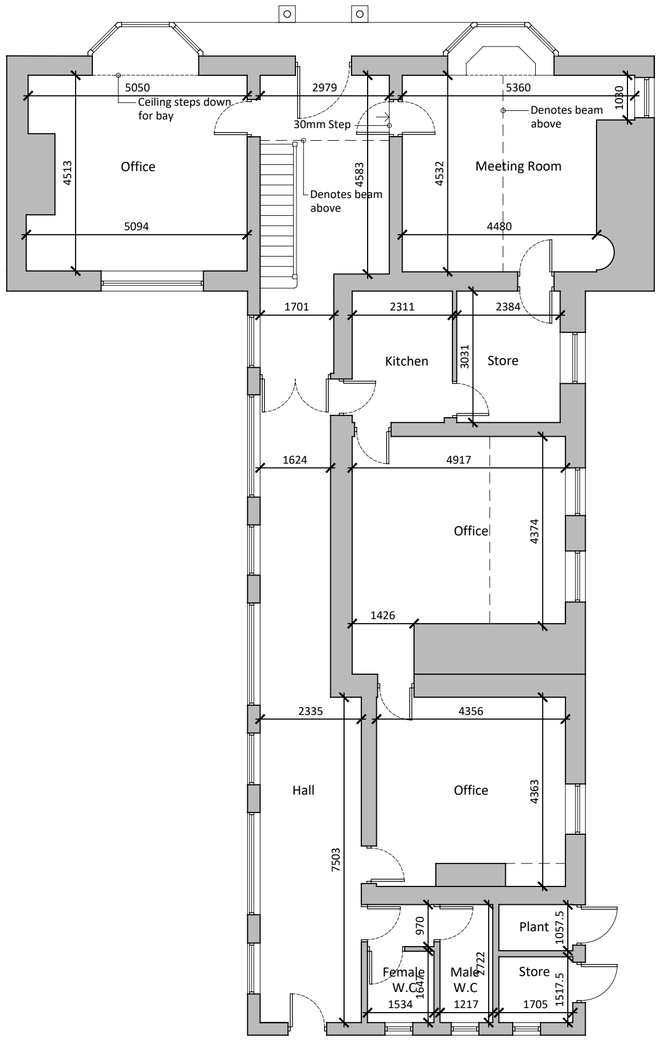
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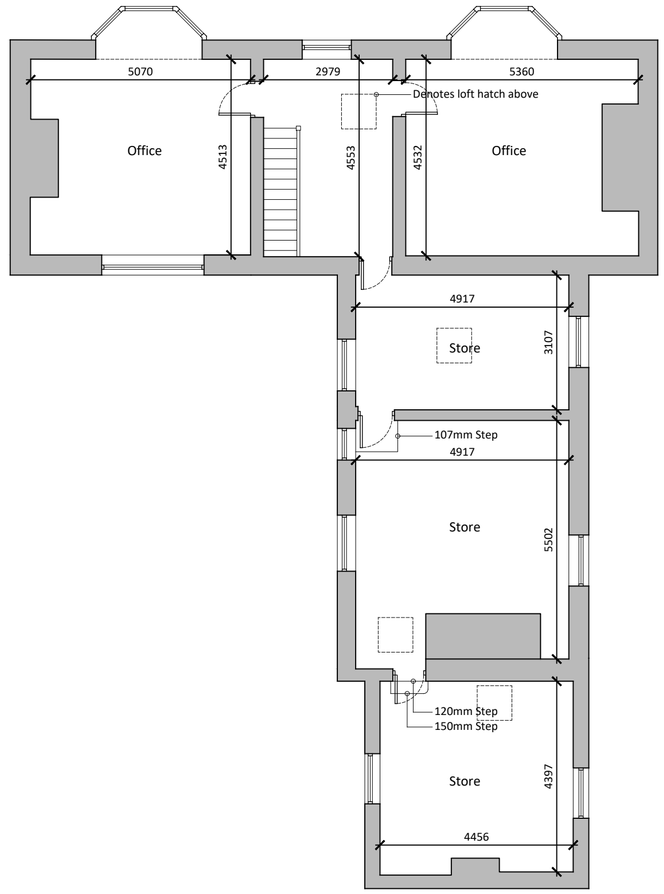
Job Number	Status	Purpose of Issue
1425-1	PA	Pre-App

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Plan 3



GROUND FLOOR PLAN



FIRST FLOOR PLAN

0 1 2 3 4 5m

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Client
Mr & Mrs J Jeffs

Project
Change of Use
Four Winds, Long Sutton

Drawing
Existing Plans

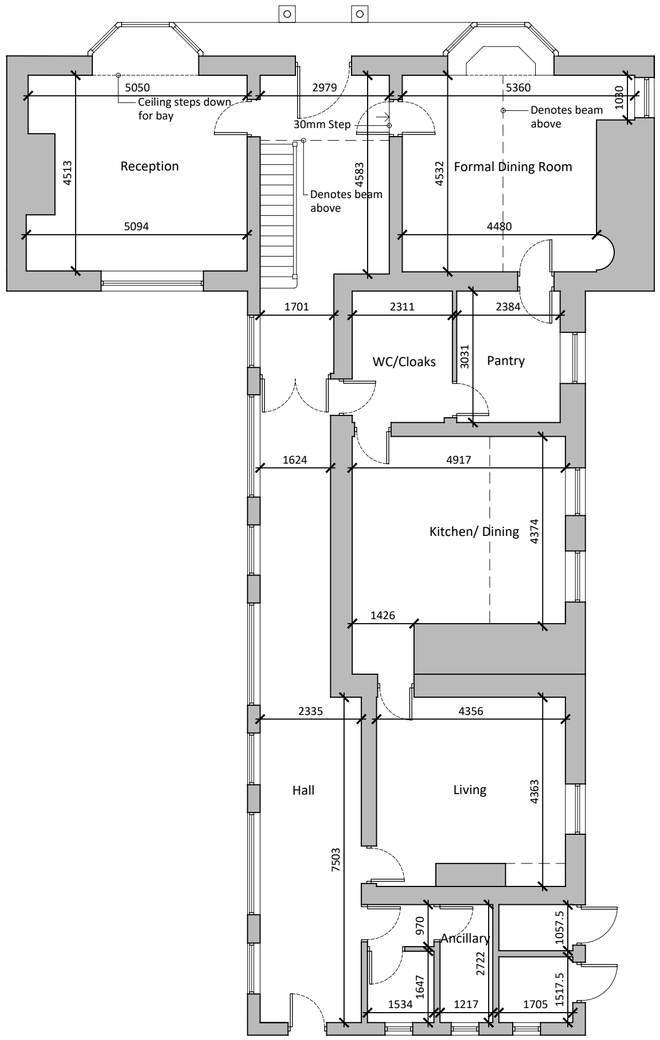
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CH	PSS

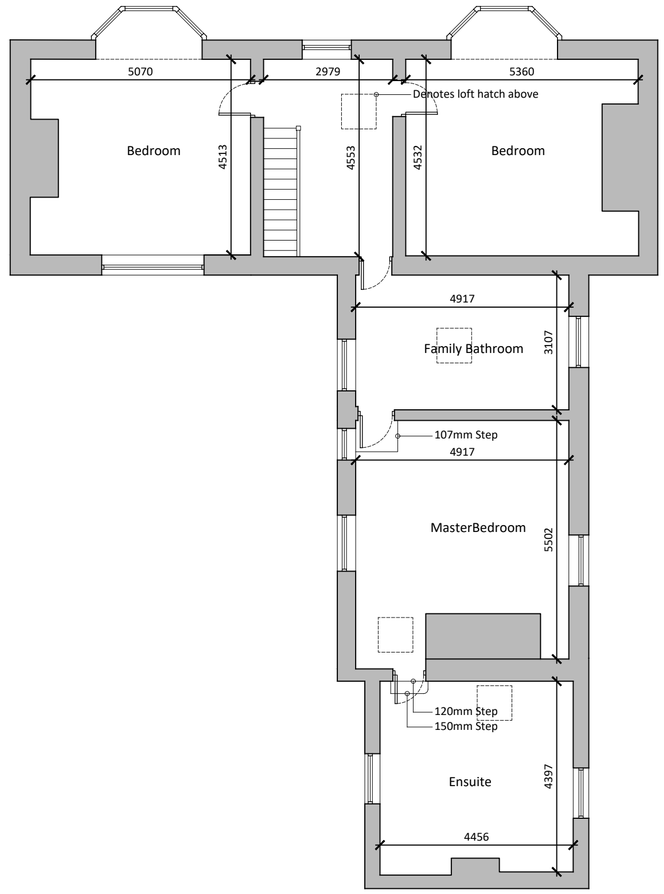
Job Number	Status	Purpose of Issue
1425-1	PA	Pre-App

Drawing No.	Rev
1425-1_PA_PL01	-

Plan 4



GROUND FLOOR PLAN



FIRST FLOOR PLAN

0 1 2 3 4 5m

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Project
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Four Winds, Long Sutton

Drawing
Proposed Plans

Scale @ A2	Date
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CH	PSS

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1425-1	PA	Pre-App

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Plan 5



EAST ELEVATION



NORTH ELEVATION



WEST ELEVATION



SOUTH ELEVATION

0 1 2 3 4 5m

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Four Winds, Long Sutton

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Existing Elevations

Scale @ A2	Date
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CH	PSS

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