FLOOD RISK ASSESSMENT

Proposed Residential Development
Reservoir Road
Surfleet Seas End
Spalding
PE11 4DQ



RM ASSOCIATES

10 Main Street
Thorpe on the Hill
Lincoln
LN6 9BG
Tel 01522 681728
Mobile 07967 304737
Email : ray.rmassociates@gmail.com
December 2020 Version 1

RMA

Contents

INTRODUCTION 3
APPLICATION SITE 3
Table 1: Flood Zones Definition (Ignoring the presence of defences) 4
Table 2: Flood Risk Vulnerability Classification 5
Site Levels 5
DRAINAGE AUTHORITIES 5
Environment Agency 5
Flood Zones 5
Risk of Flooding from Rivers & Sea 6
River Glen 6
Fluvial Flood Levels & Fluvial Flood Flows 7
Surfleet Reservoir 7
River Welland 8
Breach Analysis to River Welland Tidal Defences 8
MODELLED FLOOD EXTENTS MAP 9
SOUTH HOLLAND DISTRICT COUNCIL 10
WELLAND & DEEPINGS INTERNAL DRAINAGE BOARD 10
FLOODING FROM OTHER SOURCES 11
SURFACE WATER FLOODING 11
HISTORIC FLOOD EXTENT MAP 12
DRAINAGE STATEMENT 13
Surface Water Drainage 13
Infiltration 14
Foul Water Drainage 14
CLIMATE CHANGE 14
FLOOD PROTECTION 15
CONCLUSION 16

Figures

Map 1 Environment Agency Flood Map.
Map 2 Risk of Flooding from Rivers & Sea Map.
Map 3 Node Map
Map 4 Tidal Modal Analysis, Levels for East Coast and Wash: Immingham to the West Lighthouse.
Map 5 South Holland SFRA Residual Flood Hazard Surfleet Hazard Present Day1% fluvial and 0.5%Tidal Event Map
Map 6 South Holland SFRA Residual Flood Hazard Surfleet 2115 1% fluvial and 0.5%Tidal Event Map
Map 7 South Holland SFRA Residual Peak Depth Surfleet 2115 1% fluvial and 0.5%Tidal Event Map
Map 8 South Holland SFRA Residual Peak Velocity Surfleet 2115 1% fluvial and 0.5%Tidal Event Map
Map 9 Surface Water Flood Map
Map 10 Historic Flood Map
Plan 1 Location Plan
Plan 2 Site Layout Plan
Plan 3 Proposed Ground Floor Plan
Plan 4 Proposed First Floor Plan & Elevations
Plan 5 Topographical Survey

FLOOD RISK ASSESSMENT PROPOSED RESIDENTIAL DEVELOPMENT RESERVOIR ROAD, , SURFLEET SEAS END, SPALDING. PE11 4DJ

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.

This document has been prepared solely as a flood risk assessment and drainage statement on behalf of the client, Mr. Steve Rashleigh. RM Associates accepts no responsibility or liability for any use of this document other than by the client, for the purposes for which it was originally commissioned and prepared. If any unauthorised Third Party comes into possession of this report; they rely on it at their own risk and RM Associates owe them no duty of care or skill. All comments contained in this report, including any conclusions are based upon information available at the time of writing the report. RM Associates accepts no liability if additional information exists or becomes available after the time of writing this report. This document is the copyright of RM Associates The reproduction or transmission of all or part of this document, whether by photocopying or storing in any medium by electronic means or otherwise, without the prior written consent of RM Associates is prohibited.

This report contains public sector information licensed under the Open Government Licence v3.0.

APPLICATION SITE

The site is located on land at 88, Reservoir Road, Surfleet Seas End, Spalding PE11 4DJ within the administrative area of South Holland District Council. The National Grid Reference is TF27708 29163. **Plan 1**

This flood risk assessment has been prepared for the demolition of some buildings and the erection of a two-storey detached dwelling. **Plans 2, 3, & 4**

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

Zone 1 – Low Probability (<0.1%)

Zone 2 – Medium Probability (0.1 – 1.0%)

Zone 3 – High Probability (>1.0%)

The majority of the proposed development site is shown to be within Flood Zone 1 ‘Low Probability' with the area in the north west corner being in Flood Zone 2 and 3 as detailed on the Environment Agency's Flood Zone Maps **without defences**.

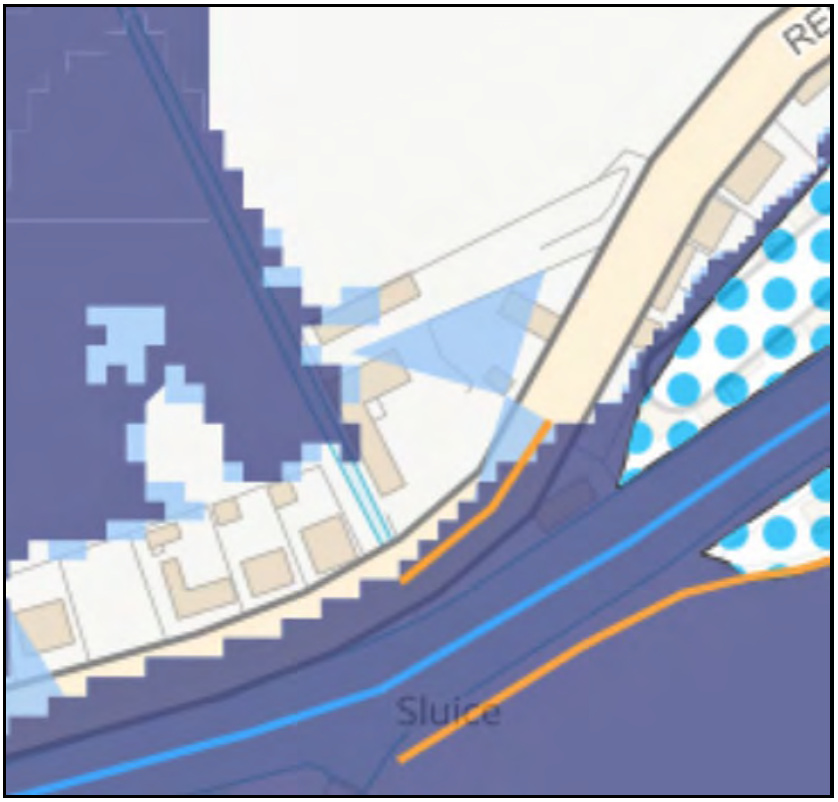


Table 1: Flood Zones Definition (Ignoring the presence of defences)

Flood Zone 1- Low Probability
Definition This zone comprises land assessed as having a less than 1 in 1,000 annual probability of river or sea flooding (<0.1%). Appropriate uses. All uses of land are appropriate in this zone. **Flood risk assessment requirements** 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. **Policy aims** 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 systems.

Applying the Flood Risk Vulnerability Classification in Table 2 of NPPG, the proposed development use for the site is considered to be ‘More Vulnerable’. Table 2 of NPPG states that such uses are permitted in these zones.

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 the topographical survey the site of the new dwelling has a slight fall from the roadside to the rear, the levels on the southern boundary are at 4.50mODN and the northern boundary lower at 3.80mODN. The land levels at the site for the new dwelling average 4.20mODN. Reservoir Road alongside the plot varies from 5.01mODN to 5.53mODN. **Plan 5**

DRAINAGE AUTHORITIES

Environment Agency

The Environment Agency has permissive powers for reducing the risk of flooding from designated main rivers and from the sea.

The following potential sources of flooding affecting the development site has been identified as:

- River Glen (Fluvial)
- River Welland (Tidal)
- Welland & Deepings Internal Drainage Board system

Flood Zones

The Flood Zone 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, 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 the floodplain.

In some locations, such as around the fens and the large coastal floodplains, showing the area at risk of flooding assuming no defences may give a slightly misleading picture in that if there were no flood defences, water would 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. It is important to understand the actual risk of the flooding to these dry islands, particularly in the event of defence failure.

Flood Zones

The Flood Map represents areas at risk of flooding for present day only and does not take account of climate change. In this area the main risk of flooding is from a breach to the tidal defences along the coastline that could affect the site These maps show that the majority of the proposed development site is considered at no risk from flooding as it is all located within an area zoned as Flood Zone 1. **Map 1**

Risk of Flooding from Rivers & Sea

The Risk of Flooding from Rivers and Sea Map shows that the site for the proposed dwelling is at Very Low risk of flooding. Very low means that each year, this area has a chance of flooding of less than 1 in 1000 (0.1%). This takes into account the effect of any flood defences that may be in this area. Flood defences reduce, but do not completely stop the chance of flooding as they can be overtopped or fail. **Map 2**

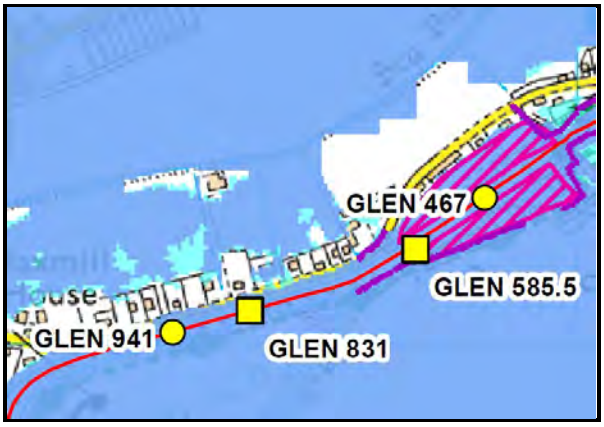
River Glen

The River Glen is located some 10m south of the southern boundary, which discharges into the tidal River Welland at Surfleet Seas End. To stop tidal/saltwater entering the River Glen there is a tidal sluice (Surfleet Sluice) located adjacent to Reservoir Road. There are high embankments along the tidal Welland to defend against flooding from extreme high tides and surge.

There are no formal flood defences reducing the risk of flooding to this site. The nearby ‘river’ channel provides a nominal level of protection.

The site lies within the Anglian River Basin District, Peak River flows should be adjusted to reflect the latest climate change allowances, the guidance now indicates for ‘more vulnerable’ uses, that the 35% Higher Central and Upper End 65% should be considered for residential developments in Anglian RBD.

The flood levels for the return periods have been taken from data supplied by the Environment Agency CCN 2020-187347 taken from the Welland Catchment Strategic Model 2016, shown in the table below.



River Glen Node Map

Fluvial Flood Levels & Fluvial Flood Flows

Fluvial Flood Levels (mODN)

The fluvial flood levels for the model nodes shown on the attached map are set out in the table below. They are measured in metres above Ordnance Datum Newlyn (mODN).

			Annual Exceedance Probability - Maximum Water Levels (mODN)										
Node Label	Easting	Northing	50% (1 in 2)	20% (1 in 5)	10% (1 in 10)	5% (1 in 20)	2% (1 in 50)	1.33% (1 in 75)	1% (1 in 100)	1% (1 in 100) inc 20% Climate Change	0.5% (1 in 200)	0.1% (1 in 1000)	0.1% (1 in 1000) inc 20% Climate Change
GLEN 467	527875	329200	3.90	4.04	4.13	4.19	4.16	4.17	4.17	4.78	4.22	4.30	4.83
GLEN 941	527448	329015	3.91	4.04	4.13	4.20	4.18	4.18	4.19	4.78	4.22	4.32	4.83
GLEN 1415	527090	328734	3.92	4.04	4.13	4.20	4.19	4.20	4.20	4.78	4.22	4.33	4.83
GLEN 2116	526491	328747	3.92	4.04	4.12	4.20	4.22	4.22	4.23	4.78	4.24	4.34	4.82

Fluvial Flood Flows (m³/s)

The fluvial flood flows for the model nodes shown on the attached map are set out in the table below. They are measured in metres cubed per second (m³/s).

			Annual Exceedance Probability - Maximum Flows (m³/s)										
Node Label	Easting	Northing	50% (1 in 2)	20% (1 in 5)	10% (1 in 10)	5% (1 in 20)	2% (1 in 50)	1.33% (1 in 75)	1% (1 in 100)	1% (1 in 100) inc 20% Climate Change	0.5% (1 in 200)	0.1% (1 in 1000)	0.1% (1 in 1000) inc 20% Climate Change
GLEN 585.5	527780	329130	58.71	60.86	62.61	64.73	64.89	65.93	65.92	77.20	68.97	76.89	85.97
GLEN 831	527553	329046	53.90	56.07	57.98	60.02	60.25	61.32	61.55	72.47	64.44	72.34	81.32
GLEN 1533.5	527014	328643	47.95	50.00	51.71	54.57	55.25	56.01	56.52	66.78	59.51	67.35	76.26
GLEN 2215.5	526408	328801	43.03	45.42	47.58	50.29	51.41	51.85	52.70	62.22	55.79	63.38	71.63

The River Glen flood levels at this location is very much influenced by the tidal River Welland and the Surfleet Reservoir and without modelling the exploration of flows and river levels are unpredictable. Therefore, the modelled 1 in 1000year with 20% climate change added has been adopted to determine the finished floor level for the dwelling. This flood level of 4.83mODN will remain in channel as Reservoir Road is above 5.00mODN

The ground floor level for the new dwelling will be set at 4.83mODN, as an extra protection, all ground floor doorways, will be provided with facilities for the fitting of 600mm demountable flood barriers.

Surfleet Reservoir

Surfleet Reservoir lies downstream of the site, immediately upstream of Surfleet Sluice on the River Glen, located close to the confluence of the River Glen and River Welland, and is classified as Flood Zone 3b or Functional

Floodplain.

During periods of high tide, the River Glen cannot discharge water into the River Welland as it is 'tide-locked' – the tide levels in the River Welland are higher than the level of water in the River Glen. During periods of tide-lock the water from the River Glen catchment cannot discharge into the River Welland and it is stored in Surfleet Reservoir to avoid flooding of agricultural land. In most conditions this water remains within the channel flowing through the reservoir, however there are occasions where the reservoir fills, and flooding occurs. This is typically when high flows in the River Glen (such as following prolonged rainfall) coincide with high or surge tides. In these instances, flooding of the berm can and does occur.

River Welland.

The River Welland is located some 700mm to the south east of the site. The flood defences reducing the risk of flooding to this site consist of earth embankments , which are inspected regularly to identify any defects.

From Lincolnshire & Northamptonshire Area Tidal Modal Analysis, levels for East Coast and Wash: Immingham to the West Lighthouse have an assessment date of 2017, which should be used in any consideration of future increases due to climate change. **Map 3**

Peak tide levels (2017) for the 1 in 200-year 50% confidence bound tide level is 5.98mODN at Marsh Road
Peak tide levels (2120) tide level a is 5.82mODN plus Higher Central climate change of 1025mm would be 7.01mODN.

Breach Analysis to River Welland Tidal Defences

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.

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

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.

The 2017 Update to SHDC, SFRA has carried out a Tidal & Fluvial Hazard Mapping, for Surfleet, following a breach to the defences. The present-day Residual Flood Hazard, Surfleet – present day 0.1% Event Probability Maps show that the site where the proposed development is not located in a low hazard area. **Map 4**

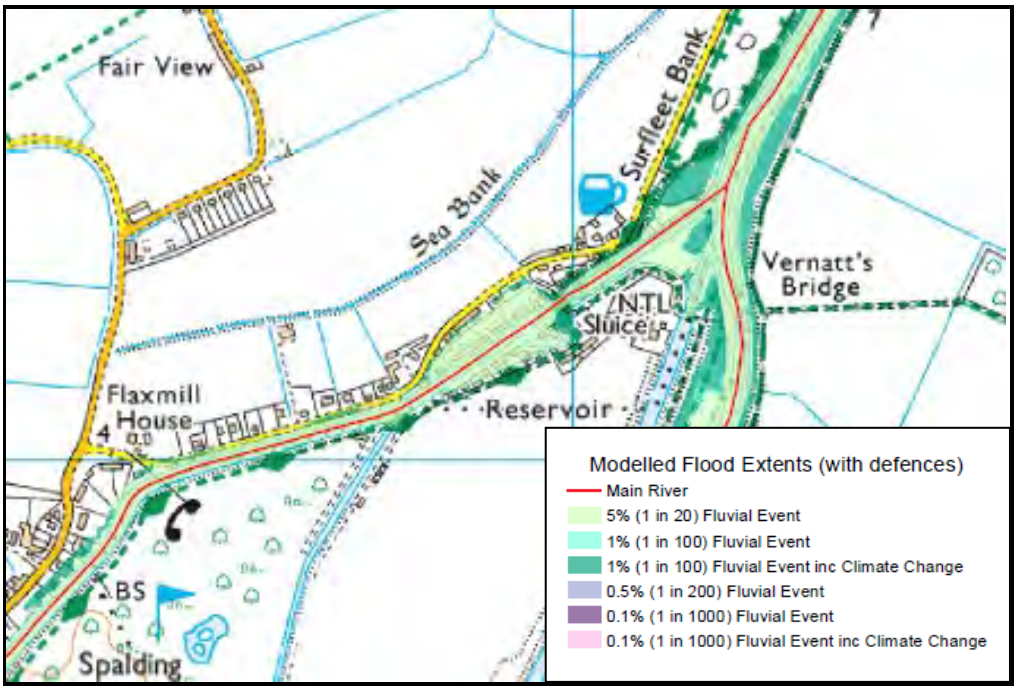
With climate change, up to year 2115 the 0.1% maps show that the site is mostly within a Low Hazard Rating Area, and the area in the north-west corner in an area 0.75 – 1.25 (Danger for Some)., Depth 0m – 0.25m and velocity 0 –0.3m/sec. **Maps 5, 6 & 7.**

The Environment Agency recommended that for housing developments 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.

They also recommended that for housing development the finished floor level should be informed by the predicted flood depth maps. For depths of between 0 – 0.25m the FFL should be set 300mm above the ground level.

It is therefore proposed, in accordance with the Environment Agency's recommendations that the ground floor habitable accommodation for the dwelling will have a finished floor level of 4.83mODN which is 530mm above the existing ground level of 4.20mODN. This will raise the property out of a local low area and the site will be landscaped to suit.

MODELLED FLOOD EXTENTS MAP



Modelled Flood Extents Map with Defences

The site is not shown to be affected from any event scenario.

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.

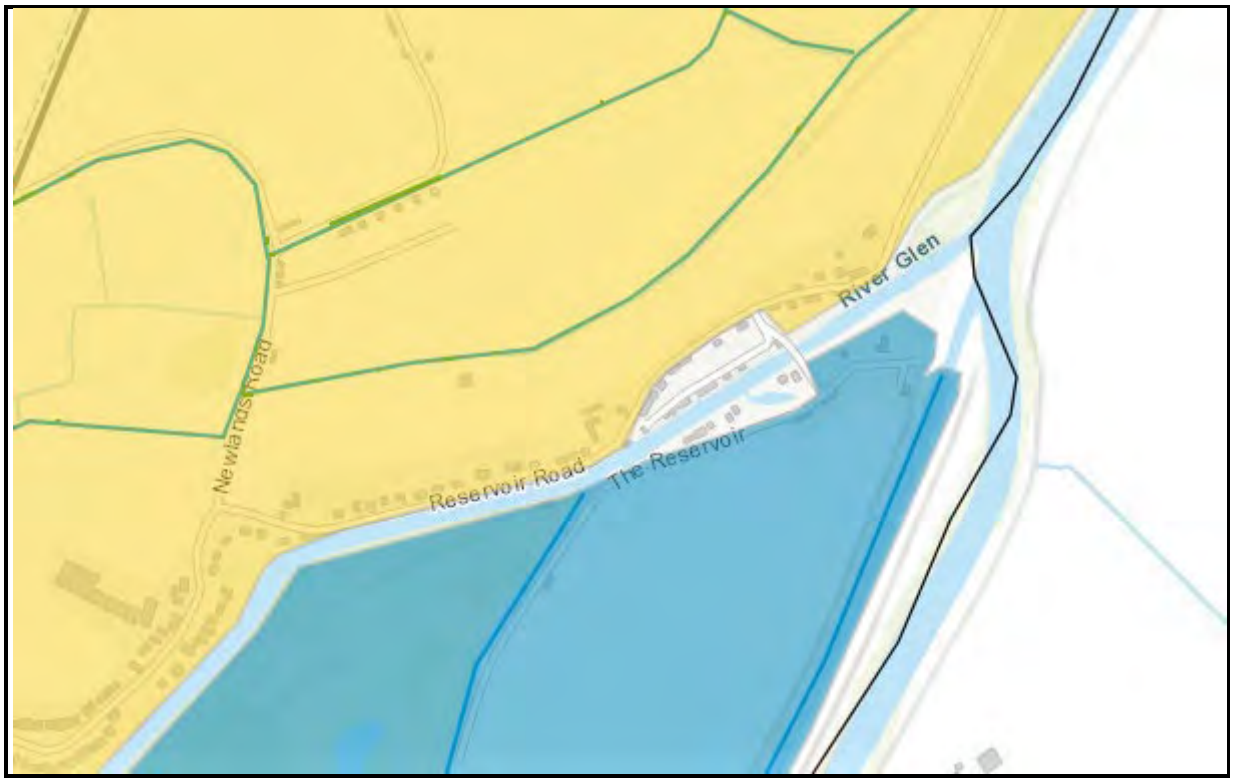
This Flood Risk Assessment has taken the results of the (2017) updated South Holland Strategic Flood Risk Assessment (SHSFRA) into account in its findings.

The whole of the tidal flooding information has been replaced by the mapping from the latest Environment Agency Tidal Hazard mapping. Where the mapping for an area contains both fluvial and tidal components, the more severe of the two has been presented.

WELLAND & DEEPINGS INTERNAL DRAINAGE BOARD

The proposed development site is located within the catchment area of Welland & Deepings Internal Drainage Board. The Board is responsible to operate and maintain the arterial fluvial system.

The site is within Board's catchment No 4 Surfleet and the nearest watercourse to the site is Drain No 55 Old Beach Drain East, located well to the north of the site of the site.



Welland & Deepings IDB Drainage Map

IDB systems are designed to provide a freeboard of between 600mm and 1000mm to all land in a 1 in 10-year return period rainfall event. This normally provides a standard of service of between 1 in 50 years and 1 in 100

years against flooding.

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 and with the proposed ground floor levels being set 530mm 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 overloading from heavy rainfall caused by blockages or having inadequate capacity. However, with the natural topographic nature of the ground having no high ground around the site and with the proposed ground floor levels being set 530mm above the existing ground floor level this will not cause any rapid inundation 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.

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. The Environment Agency and the Lead Local Flood Authority (custodians of the surface water flood risk dataset) have subsequently confirmed that the published high-level data should not be used on a site-specific basis and that mapping is only suitable for National to County Scale use.

HISTORIC FLOOD EXTENT MAP

The Historic Flood Extent Map showing the extent of previous recorded flooding shows that the site has not been subject to flooding. The map shows that the Surfleet Reservoir stored water in 1998. It is also known to have stored water on other occasions, most notably in 1994, 2000, 2009 and 2013. **Map 9**

SEQUENTIAL APPROACH

When applying the sequential approach for flood risk in accordance NPPF the site would fall into Zone 1 (Low Probability) 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 having a less than 1 in 1,000 annual probability of river or sea flooding. (Shown as 'clear' on the Flood Map – all land outside Zones 2 and 3)
- Flood Zone 2 is Land having between a 1 in 100 and 1 in 1,000 annual probability of river flooding: or land having between a 1 in 200 and 1 in 1,000 annual probability of sea flooding. (Land shown in light blue on the Flood Map)
- Flood Zone 3a is Land having a 1 in 100 or greater annual probability of river flooding; or Land having a 1 in 200 or greater annual probability of sea flooding. (Land shown in dark blue on the Flood Map)

Applying the Flood Risk Vulnerability Classification in Table 2 of NPPG, the proposed use is classified as, "More Vulnerable" use, Table 1 of NPPG states that such uses are appropriate in this zone subject to the exception test, (as summarised in Table 3 NPPG)

TABLE 3: Flood Risk Vulnerability and Flood Zones '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 & Exception 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.

This windfall site is located within the settlement boundary for Surfleet, a Minor Service Centre as set out in the South East Lincolnshire Local Plan (2019). Policy 1 (Spatial Strategy) of the Local Plan. This states that within the settlement boundaries of these centres, development will normally be limited to allocated and committed sites and infill.

The NPPF requires the application of the Sequential Test to steer new development to areas with the lowest probability of flooding. If, following the application of the Sequential Test, it is not possible, consistent with wider sustainability objectives, for the development to be located in zones with a lower probability of flooding, the Exceptions Test can be applied if appropriate.

With most of the site being constructed within the area shown on the Environment Agency Flood Map (without defences) to be in Flood Zone 1, it need not be considered further in relation to the Sequential or Exception Tests for the location of new development with respect to flood risk. Examination of Table 3 shows that for Flood Zone 1, **all** vulnerability classifications are appropriate for development.

This Flood Risk Assessment in terms of making the development safe, would result in finished floor levels being set at 4.83mODN. This would be sufficient to mitigate against flood risk and demonstrates that the development will be safe for its lifetime and it will not increase flood risk elsewhere.

Given the above, it is concluded that the Sequential and Exceptions Test are satisfied.

DRAINAGE STATEMENT

Surface Water Drainage

This drainage statement, for the site, proposes to utilise infiltration techniques to reduce the storm water discharge

from the proposed development and to minimise the impact of the development on the surrounding area and to comply with guidelines, which require at least one workable solution for managing surface water.

In accordance with recognised guidance, National Planning Policy Framework 2012, there is a hierarchy of where surface water should discharge. This hierarchy should be followed where practicable, and is as follows:

1) Infiltration
2) Watercourse
3) Public sewer

Infiltration

It is proposed that surface water from the roof of the proposed dwellings will be discharged to soakaways, designed in accordance with BRE Digest 365.

The access and car parking areas will be constructed with permeable materials to infiltrate into the ground.

Foul Water Drainage

With there being no public sewers serving the area the foul drainage from the property will be collected in underground pipes designed in accordance with Building Regulations. Document H. and be connected into a package treatment unit

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 19th February 2016 and again 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 Higher Central and Upper End river flow allowances figures in Table 1 should be used.

Table 1 Peak river flow allowances by river basin district (1961 to 1990 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 allowance in small and urban catchments (1961 to 1990 baseline)

Applies across al 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%
Higher 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 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
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

The tidal flood defences consist of earth embankments are, they are in good condition and are well maintained by the Environment Agency.

Climate Change using Higher Central allowances

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**

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 development will have the following resilient measures incorporated in the construction in accordance with “Improving the flood performance of new buildings” CLG (2007).

- The ground floor living accommodation for the two-storey dwelling is to be raised 530mm above the existing average ground level, to be set at a level of 4.83mODN.

- Water, electricity, and gas meters: should be located above the predicted flood level. Electrical services: electrical sockets, heating systems: boiler units and ancillary devices should be installed at least 500mm above the ground floor level to minimise damage to electrical services Electric ring mains should be installed at first floor level with drops to ground floor sockets and switches.

- The ground floor to be constructed with a solid concrete floor with no voids beneath and no low-level wall vents. However, if a beam type floor is to be used, provision should be incorporated for draining

the under-floor voids. The wall vents are to be fitted with 'Flood Angel' air bricks which allow air to free pass through as a usual, (complying with BS493:1995) but under flood conditions it shuts down when in contact with water. A removable mesh prevents the passage of debris which may otherwise impinge on the moving part.

- Avoid the use of absorbent cavity insulation to the ground floor level and use the closed cell type.

- Plasterboard to be fixed horizontally to the ground floor area, for ease of replacement.

- Where possible, all service entries should be sealed (e.g., with expanding foam or similar closed cell material). Closed cell insulation should be used for pipes which are below the predicted flood level.

- As this site is in an area that is capable of receiving 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 property 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 flood defences which are well maintained by the Environment Agency.

- The proposed site for the dwelling is shown to be within Flood Zone 1 'Low Probability' as detailed on the Environment Agency's Flood Zone Maps without defences.

- The 2017 Update to SHDC, SFRA Tidal & Fluvial Hazard Mapping, for District following a breach to the defences for the present day the site is not within a hazard area. With climate change, up to year 2115 the maps show that the site is mostly within a Low Hazard Rating Area, and the area in the north-west corner in an area 0.75 – 1.25 (Danger for Some)., depth of flow 0 – 0.25m and velocity 0 – 0.3m/sec. The Higher Central climate change flood level for the River Glen is predicted to remain within channel.

- The ground floor living accommodation for the two-storey dwelling is to be raised 530mm above the existing average ground level, to be set at a level of 4.83mODN. The first-floor level will provide a safe haven for the residents.

- The Flood Risk Vulnerability Classification in Table 2 of NPPG the proposed residential development is classified as "More Vulnerable", with Table 1 of NPPG stating that such uses are appropriate in this zone.

- Any impact of damage to the property can be foreseen and mitigated against by relatively simple design

and construction techniques. They will be constructed using materials which are flood resilient construction as outlined in the report.

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

- No obvious constraints have been identified that may impact the proposed development and the type of mitigation measures that can be used to reduce the flood risk, there is no increase in the flood risk to others. Following the guidelines contained within the NPPF, the proposed development is considered to be suitable assuming appropriate mitigation is maintained for the lifetime of the development.

Flood map for planning

Your reference	Location (easting/northing)	Created
Surfleet	**527704/329149**	**21 Dec 2020 11:56**

Your selected location is in flood zone 1, an area with a low probability of flooding.

This means:

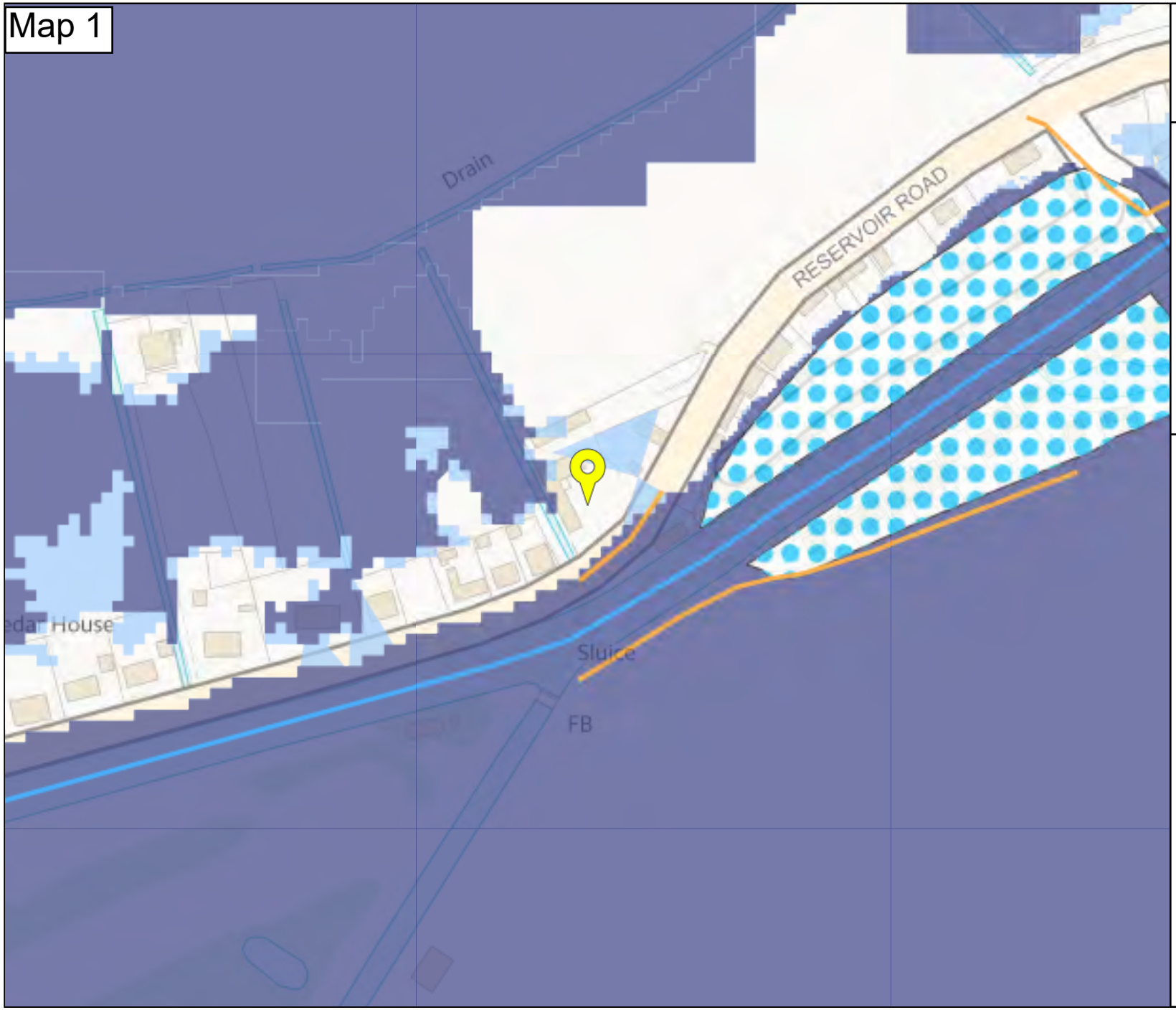
- you don't need to do a flood risk assessment if your development is smaller than 1 hectare and not affected by other sources of flooding
- you may need to do a flood risk assessment if your development is larger than 1 hectare or affected by other sources of flooding or in an area with critical drainage problems

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.

The Open Government Licence sets out the terms and conditions for using government data.
https://www.nationalarchives.gov.uk/doc/open-government-licence/version/3/



Environment Agency

Flood map for planning

Your reference
Surfleet

Location (easting/northing)
527704/329149

Scale
1:2500

Created
21 Dec 2020 11:56

- 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

0 20 40 60m

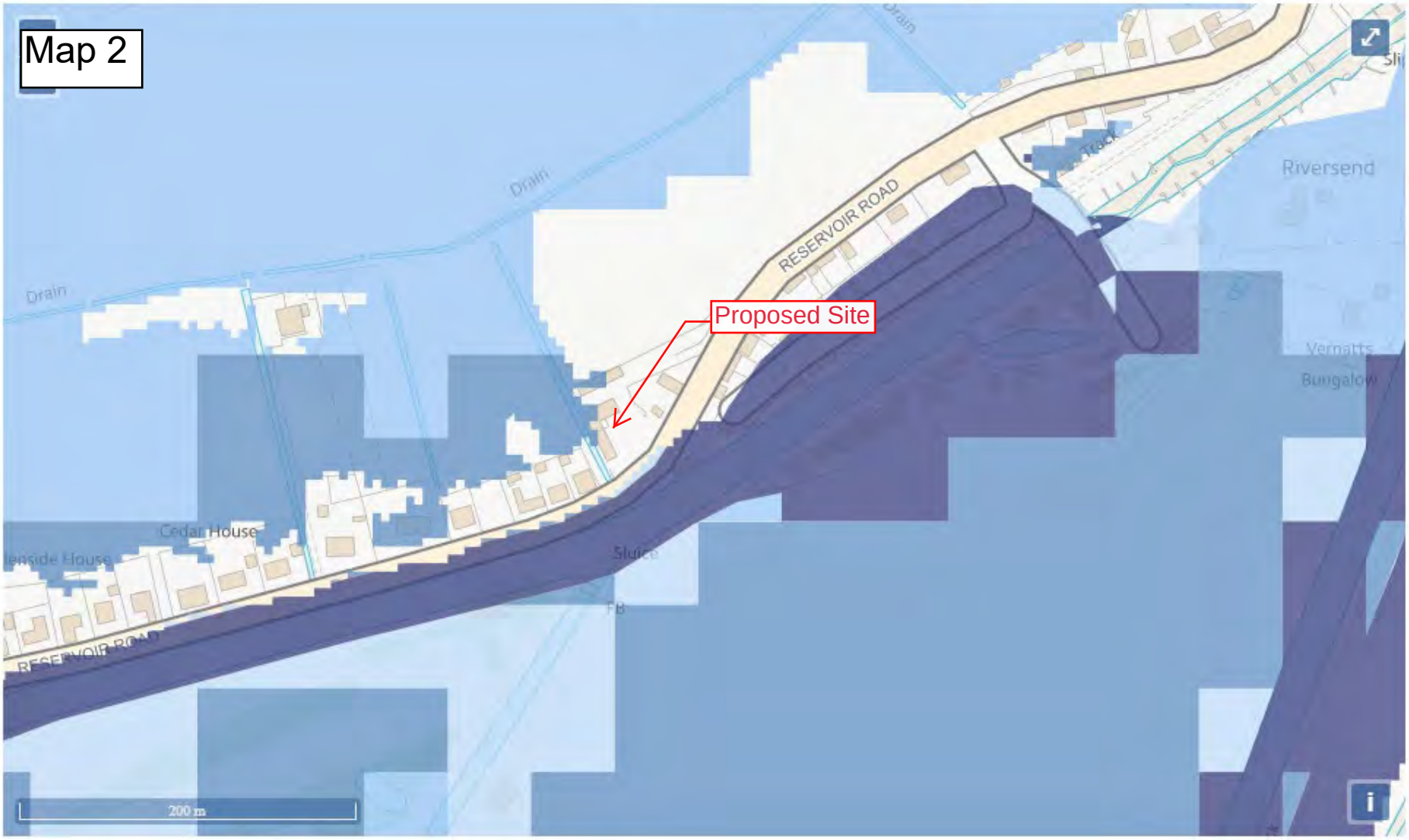
© Environment Agency copyright and / or database rights 2018. All rights reserved. © Crown Copyright and database right 2018. Ordnance Survey licence number 100024198.

Flood risk

Extent of flooding

Location

Surfleet Seas End

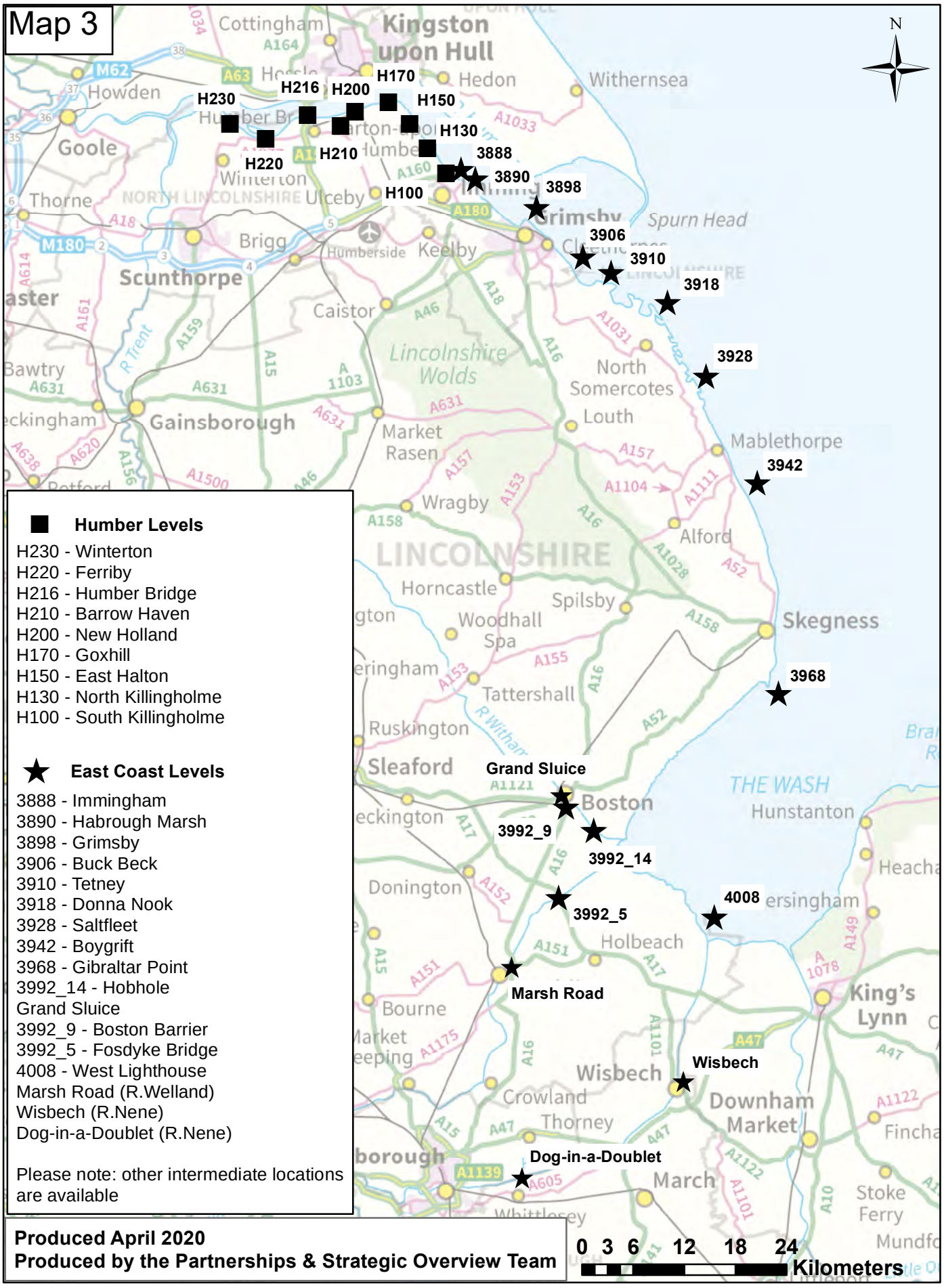


Extent of flooding from rivers or the sea

High Medium Low Very low

Tidal Level Location Map
Lincolnshire & Northamptonshire Area

Environment Agency



© Environment Agency copyright and / or database rights 2020. All rights reserved. © Crown Copyright and database right. All rights reserved. Environment Agency,10002638 2020.

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.

Customer services line: 03708 506 506
Calls to 03 numbers cost the same as calls to standard geographic numbers
(i.e. numbers beginning with 01 or 02)

Email: enquiries@environment-agency.gov.uk
www.gov.uk/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			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

Customer services line: 03708 506 506
Calls to 03 numbers cost the same as calls to standard geographic numbers
(i.e. numbers beginning with 01 or 02)

Email: enquiries@environment-agency.gov.uk
www.gov.uk/environment-agency

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

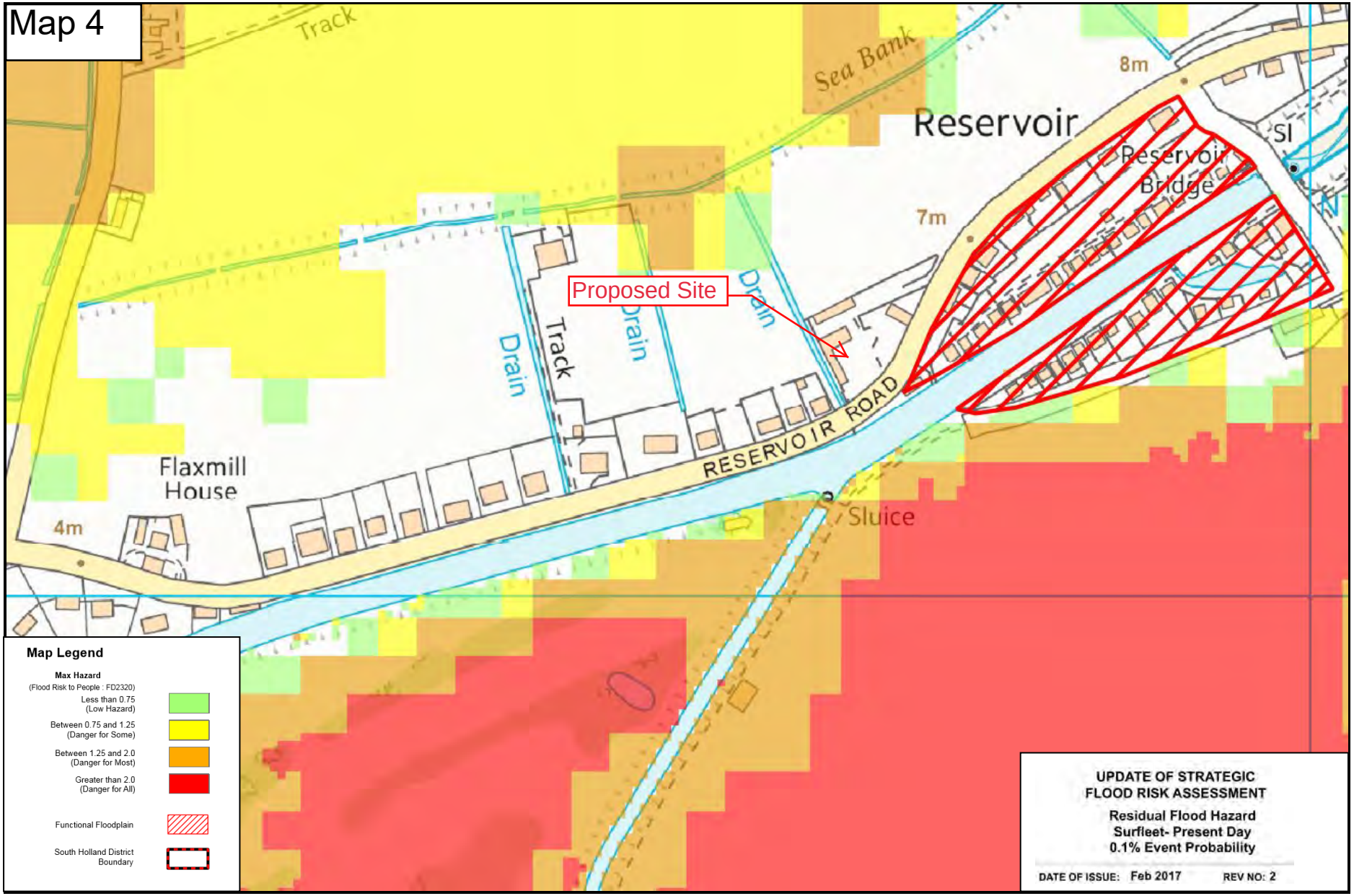
- The base date for the data is 2006
- The levels are still water levels. Depending on the use of the data it may be necessary to consider wave heights and / or joint probability analysis of water level and other variables.
- Levels for other annual chance probabilities are available if required.
- These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

The following notes apply to Grand Sluice

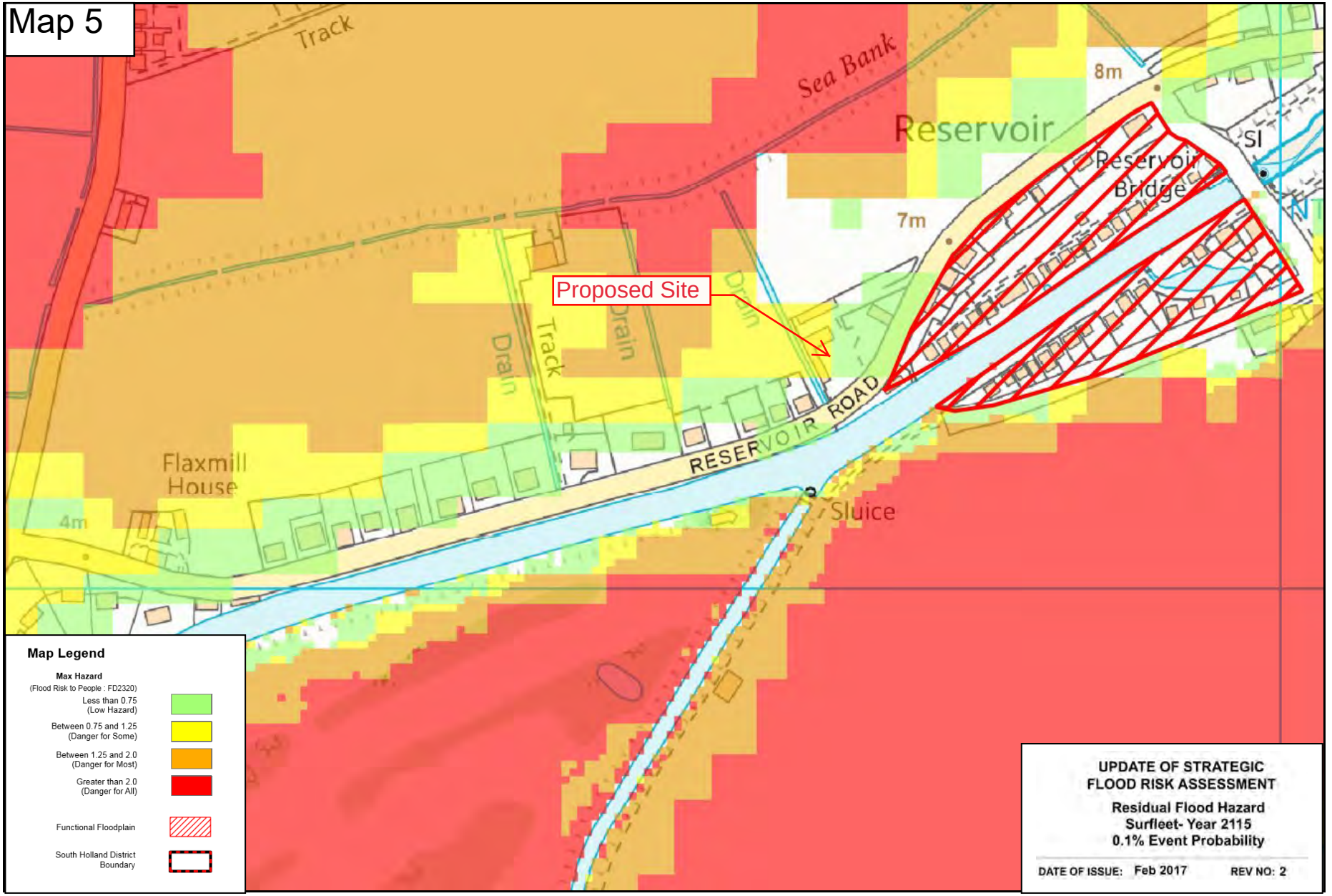
- The data is based on CFB 2018 data for Boston Barrier site, capped at 5.3mAOD to reflect use of the barrier.
- The base date for the data is 2017
- The levels are still water levels. Depending on the use of the data it may be necessary to consider wave heights and / or joint probability analysis of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

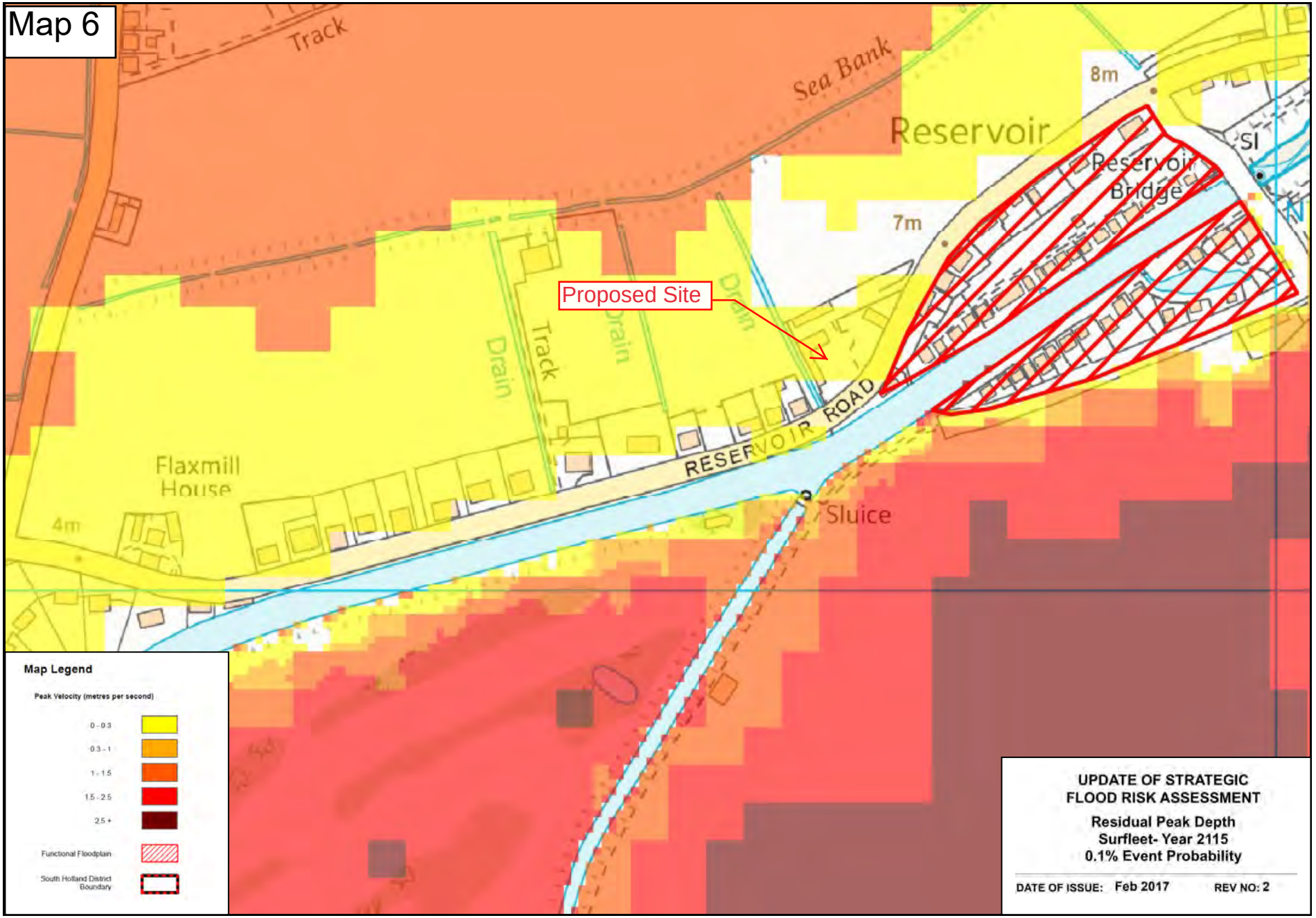
Customer services line: 03708 506 506
Calls to 03 numbers cost the same as calls to standard geographic numbers
(i.e. numbers beginning with 01 or 02)

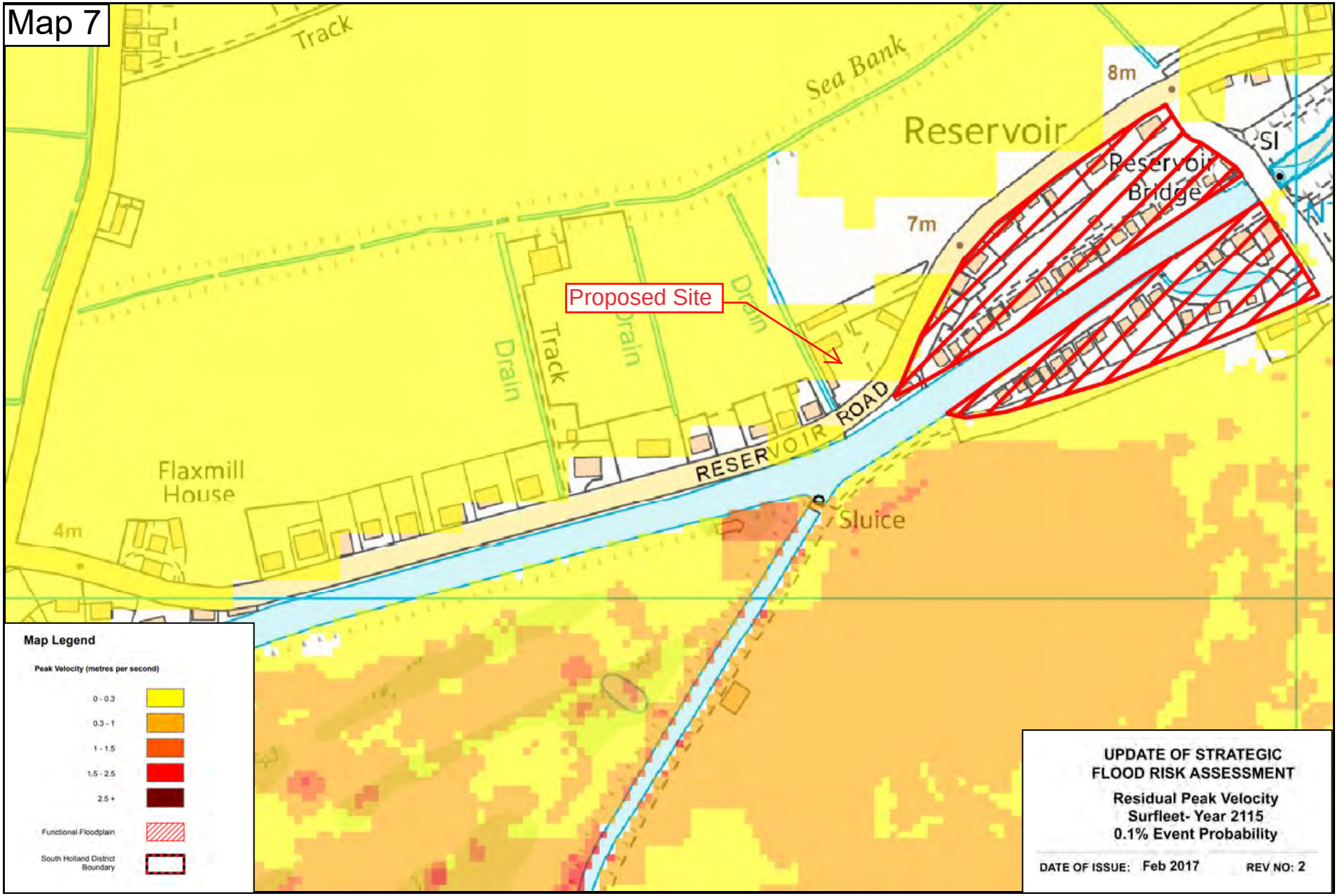
Email: enquiries@environment-agency.gov.uk
www.gov.uk/environment-agency


Map 4
Track
Sea Bank
8m
Reservoir
Reservoir Bridge
SI
7m
Proposed Site
Drain
Drain
Drain
Track
RESERVOIR ROAD
Flaxmill House
4m
Sluice
Map Legend
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)
Functional Floodplain
South Holland District Boundary
UPDATE OF STRATEGIC FLOOD RISK ASSESSMENT
Residual Flood Hazard
Surfleet- Present Day
0.1% Event Probability
DATE OF ISSUE: Feb 2017
REV NO: 2

Map 5


Track
Sea Bank
8m
Reservoir
Reservoir
Bridge
SI
7m
Proposed Site
Drain
Track
Drain
Drain
RESERVOIR ROAD
Flaxmill
House
4m
Sluice
Map Legend
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)
Functional Floodplain
South Holland District
Boundary
UPDATE OF STRATEGIC
FLOOD RISK ASSESSMENT
Residual Flood Hazard
Surfleet- Year 2115
0.1% Event Probability
DATE OF ISSUE: Feb 2017
REV NO: 2


Map 6
Track
Sea Bank
8m
Reservoir
SI
Reservoir
Bridge
7m
Proposed Site
Drain
Track
Drain
RESERVOIR ROAD
Flaxmill
House
4m
Sluice
Map Legend
Peak Velocity (metres per second)
0 - 0.3
0.3 - 1
1 - 1.5
1.5 - 2.5
2.5 +
Functional Floodplain
South Holland District Boundary
UPDATE OF STRATEGIC
FLOOD RISK ASSESSMENT
Residual Peak Depth
Surfleet- Year 2115
0.1% Event Probability
DATE OF ISSUE: Feb 2017
REV NO: 2


Map 7
Track
Sea Bank
8m
Reservoir
SI
Reservoir
Bridge
7m
Proposed Site
Drain
Drain
Drain
Track
RESERVOIR ROAD
Flaxmill
House
4m
Sluice
Map Legend
Peak Velocity (metres per second)
0 - 0.3
0.3 - 1
1 - 1.5
1.5 - 2.5
2.5 +
Functional Floodplain
South Holland District Boundary
UPDATE OF STRATEGIC
FLOOD RISK ASSESSMENT
Residual Peak Velocity
Surfleet- Year 2115
0.1% Event Probability
DATE OF ISSUE: Feb 2017
REV NO: 2

Flood risk

Low risk: depth

Location

Surfleet Seas End

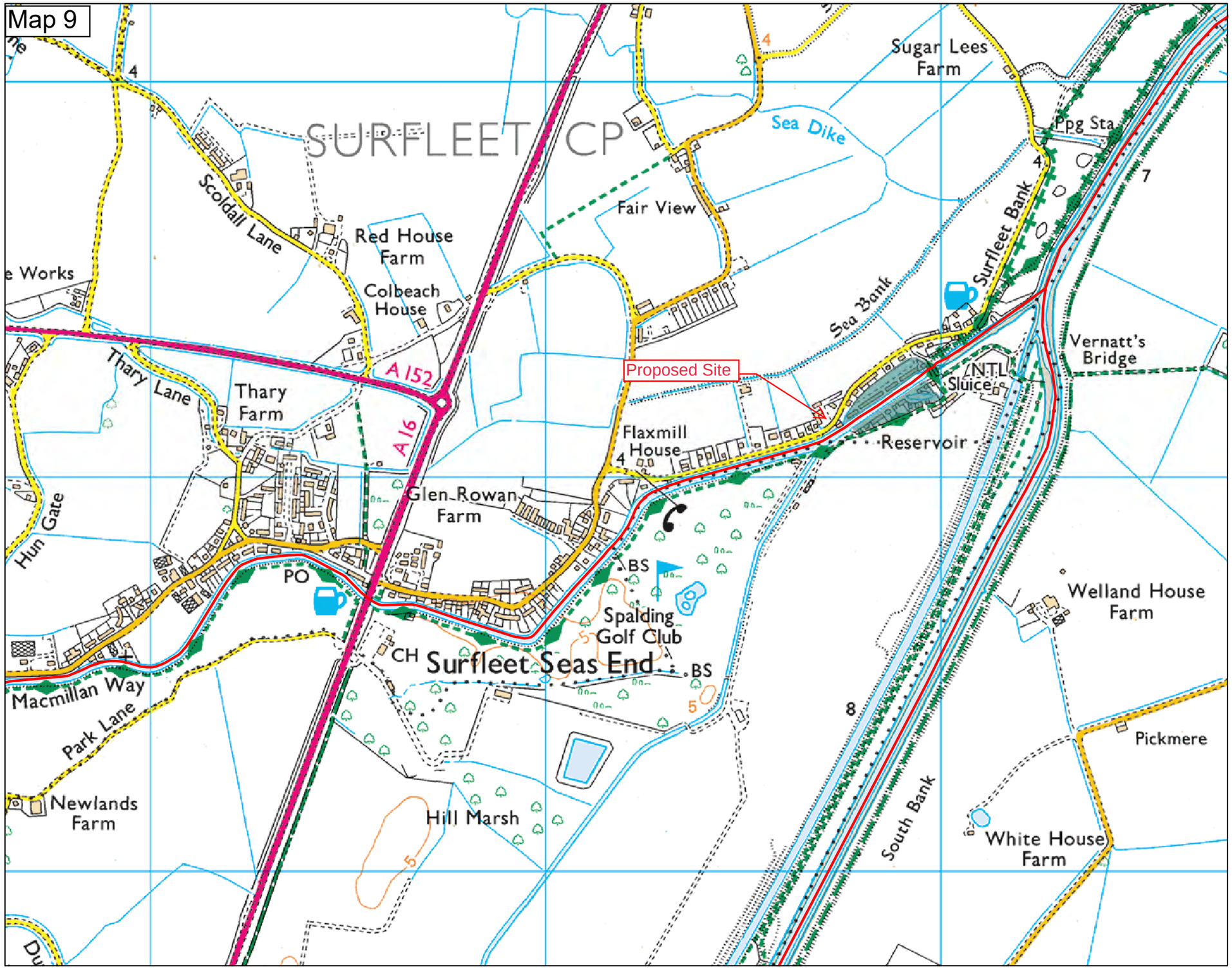


Surface water flood risk: water depth in a low risk scenario

Flood depth (millimetres)

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

Historic Flood Map centred on TF 27180 28979 - created October 2020 [Ref: CCN-2020-187347]



Environment Agency

Scale 1:10,000

N

Legend

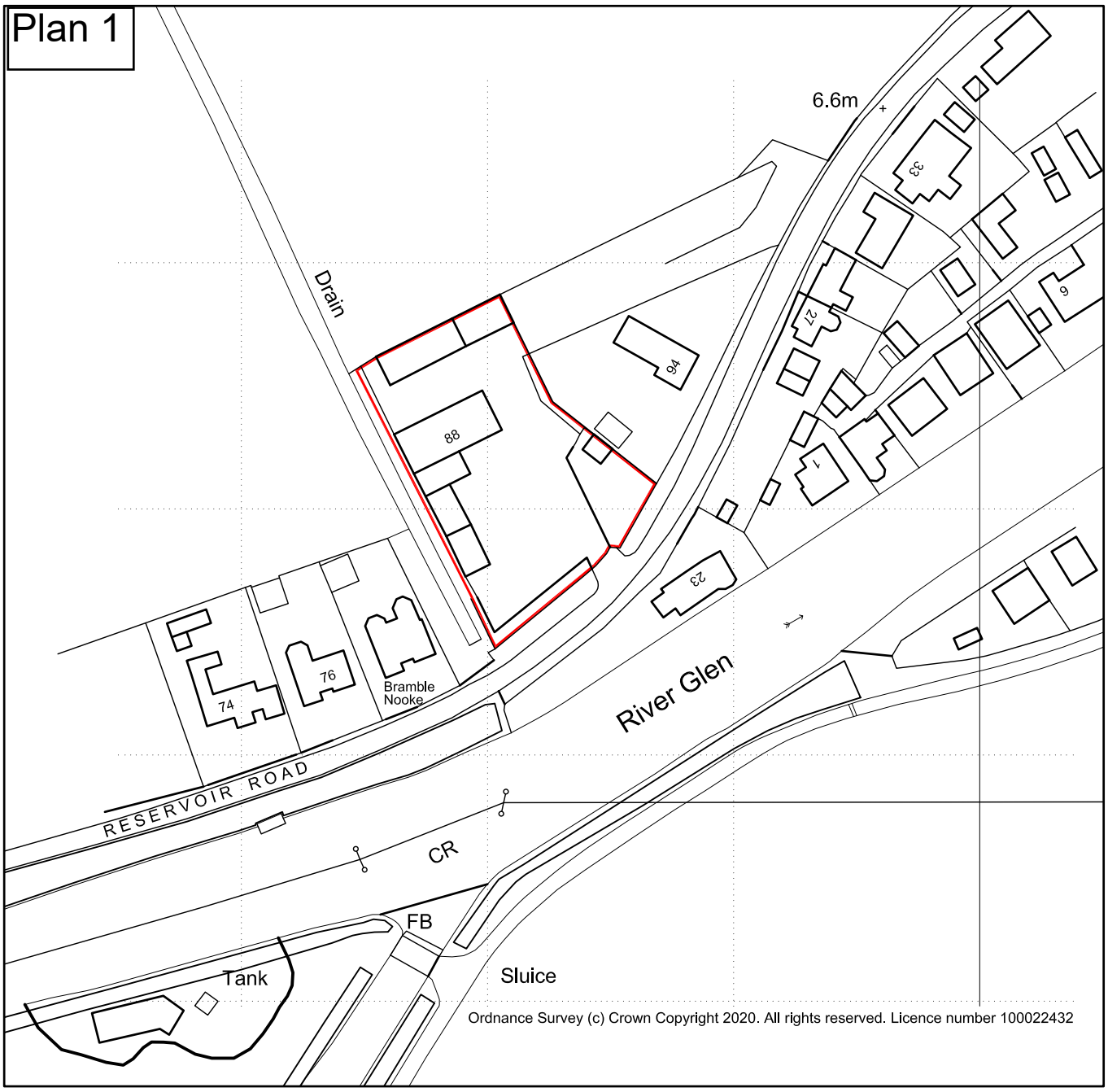
- Main River
- Easter 1998 on the River Glen at Surfleet

Created by the Partnership & Strategic Overview Team, Kettering

© Environment Agency copyright and / or database rights 2020. All rights reserved. © Crown Copyright and database right. All rights reserved. Environment Agency, 100026380, 2020.

Contact Us: National Customer Contact Centre, PO Box 544, Rotherham, S60 1BY. Tel: 03708 506 506 (Mon-Fri 8-6). Email: enquiries@environment-agency.gov.uk

Plan 1



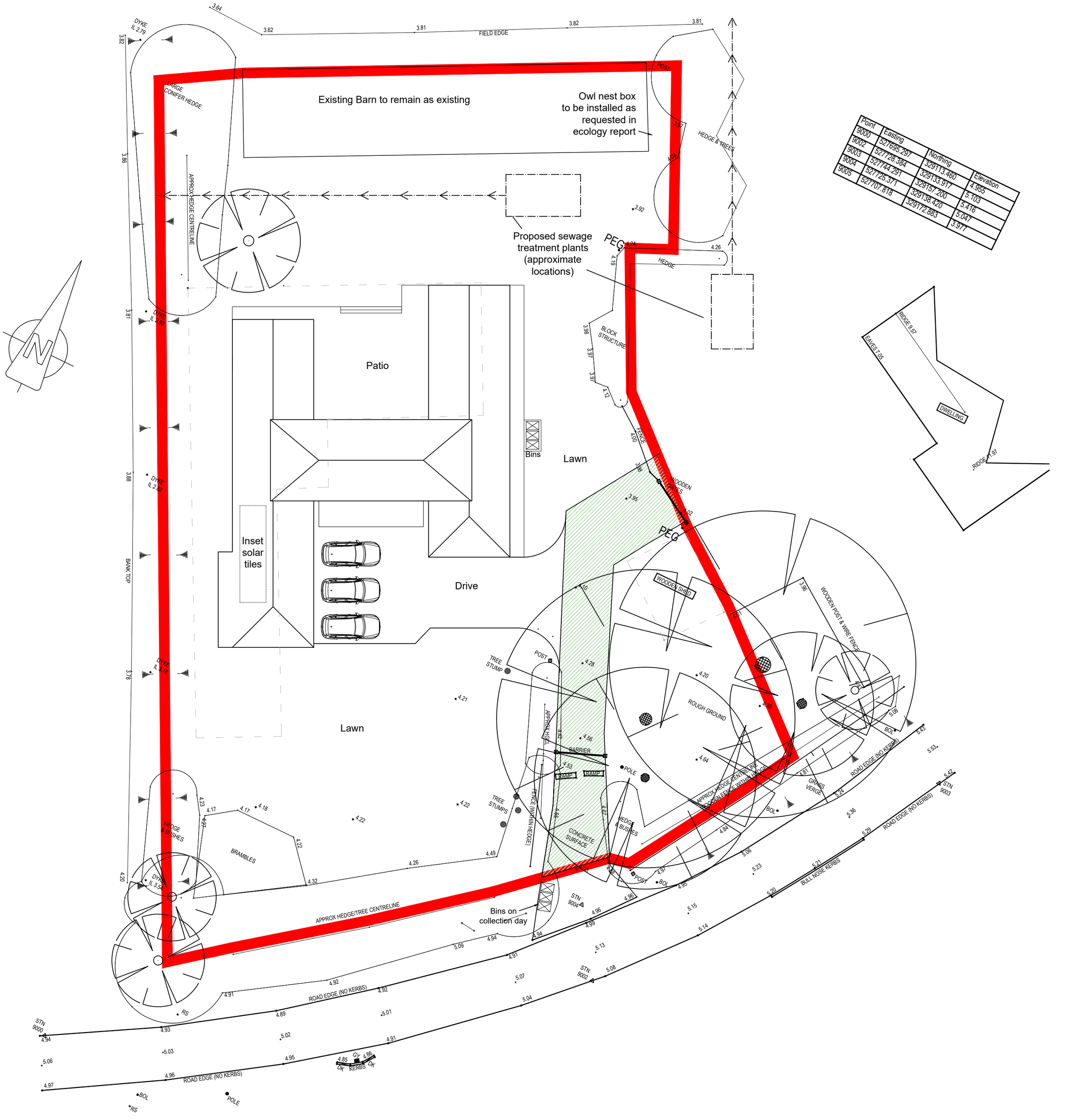
Ordnance Survey (c) Crown Copyright 2020. All rights reserved. Licence number 100022432

J M A D Architecture
www.jennymcintee.co.uk info@jmadarch.co.uk Tel 07921 003153

Project:	Proposed Dwelling	Date:	October 2020
Address:	88 Reservoir Road, Surfleet Seas End, Spalding PE11 4DH	Scale:	1:1250 on A4
		drawn: TB JM	checked: JM
Client:	c / o JMAD Architecture	Job No:	20132
Drawing Title:	Location Plan	Dwg No:	01

Location Plan

Plan 2



Point	Easting	Northing	Elevation
9000	527695.297	329113.460	4.955
9002	527728.384	329133.917	5.103
9003	527744.291	329157.200	5.416
9004	527725.371	329138.420	5.047
9005	527707.818	329172.883	3.977

Site Block Plan

DRAINAGE
Foul drainage to new sewage treatment plants
Surface water drains to new soakaways

SCALE

0 5 10 15 20 25m

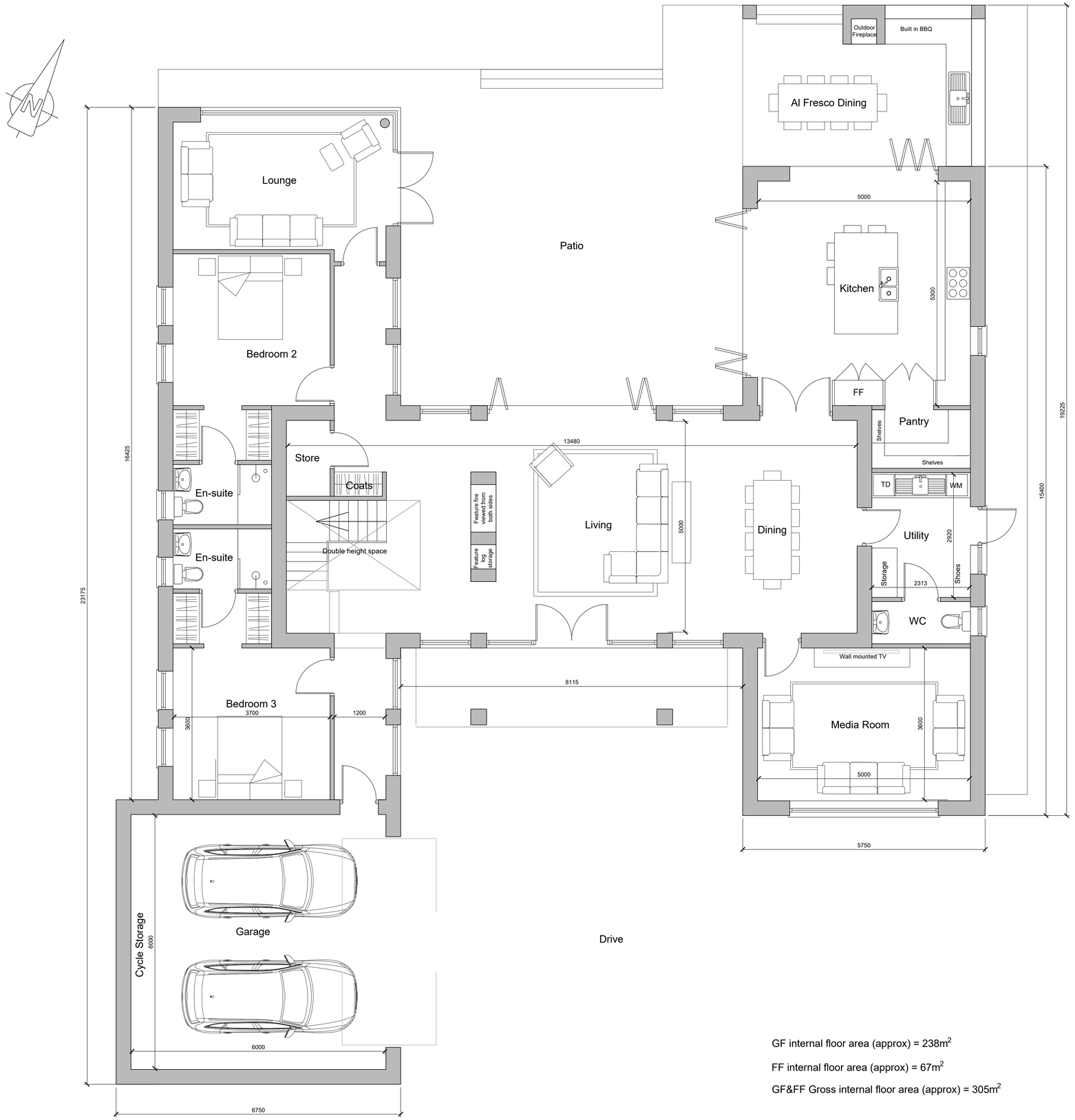
Rev B Nov 2020 Boundary line, demolished barns, rear projection size

J M A D Architecture

www.jennymcintee.co.uk info@jmadarch.co.uk Tel 07921 003153

Project:	Proposed Dwelling	Date:	November 2020
Address:	88 Reservoir Road, Surfleet Seas End, Spalding PE11 4DH	Scale:	1:200 on A2
		drawn: TB JM	checked: JM
Client:	c / o JMAD Architecture	Job No:	20132
Drawing Title:	Site Plan as Proposed	Dwg No:	02B

Plan 3



1:50 0 3 6 9 12 15 feet / 0 1 2 3 4 5 m

GF internal floor area (approx) = 238m^2

FF internal floor area (approx) = 67m^2

GF&FF Gross internal floor area (approx) = 305m^2

Rev B Dec 2020 Amended wall thickness

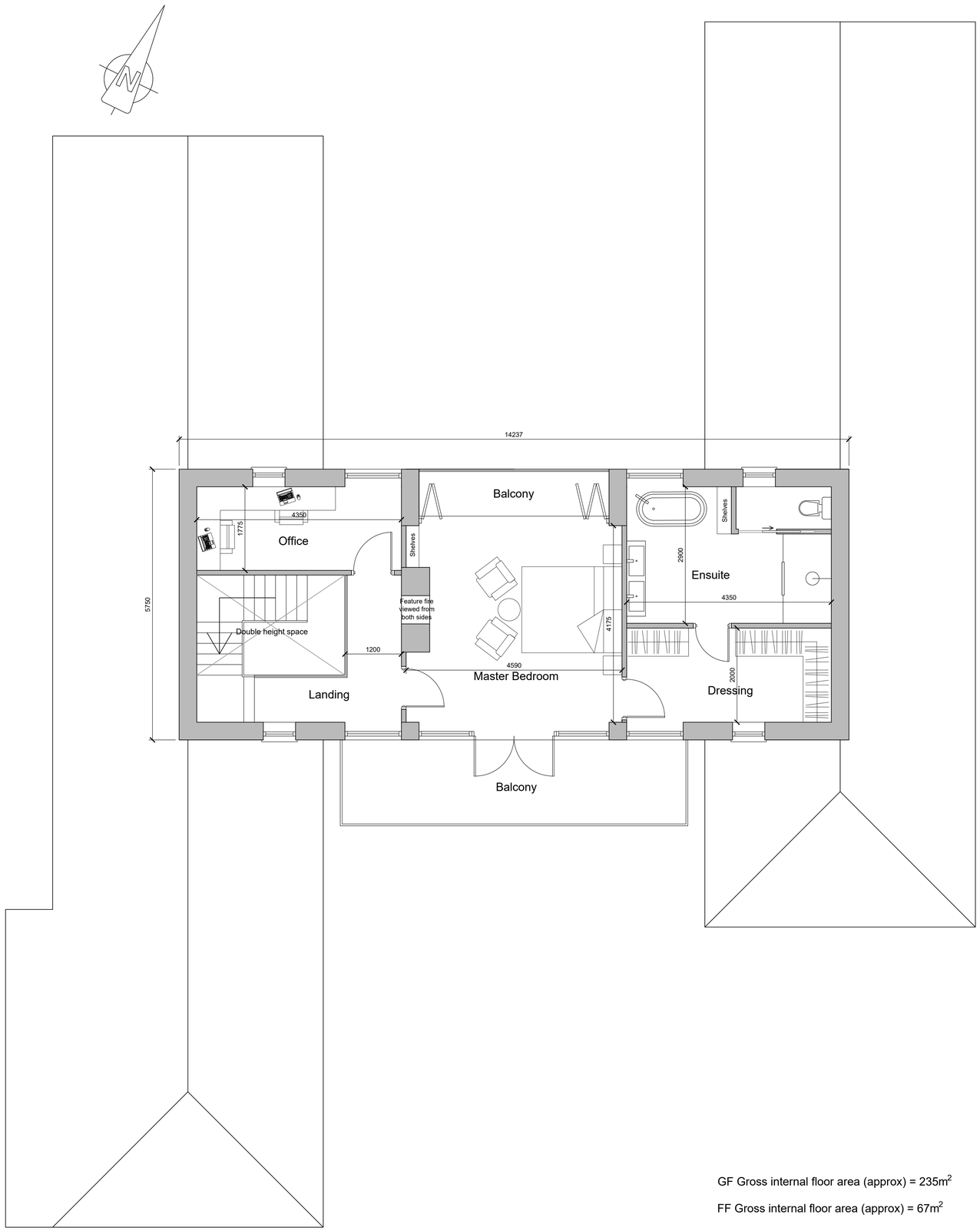
J M A D Architecture

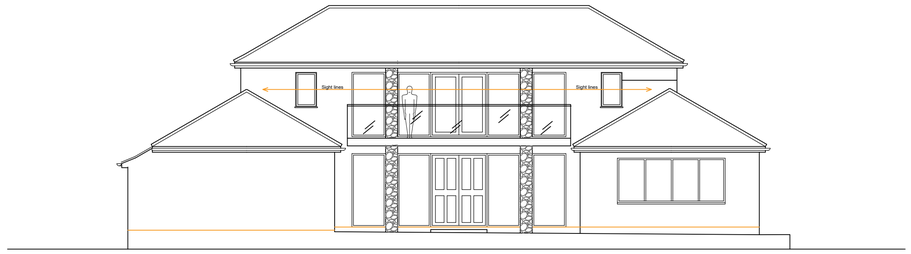
www.jennymcintee.co.uk info@jmadarch.co.uk Tel 07921 003153

Project:	Proposed Dwelling	Date:	November 2020
Address:	88 Reservoir Road, Surfleet Seas End, Spalding PE11 4DH	Scale:	1:50 on A1
		drawn: TB JM	checked: JM
Client:	c / o JMAD Architecture	Job No:	20132
Drawing Title:	Proposed Ground Floor Plan	Dwg No:	03B

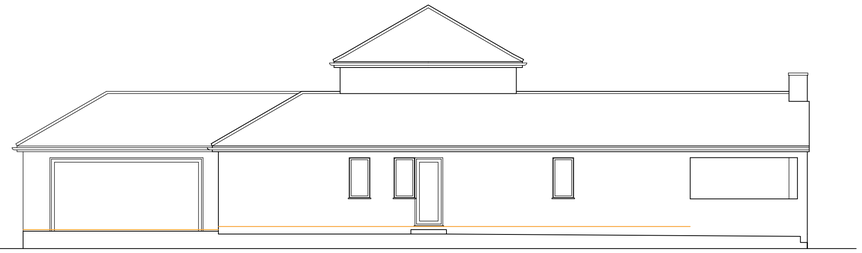
Proposed GF Plan

Plan 4





Front Elevation



Side Elevation



Rear Elevation



Side Elevation

GF Gross internal floor area (approx) = 235m^2

FF Gross internal floor area (approx) = 67m^2

1:100 0 3 6 9 12 15 feet / 0 1 2 3 4 5 m

1:50 0 3 6 9 12 15 feet / 0 1 2 3 4 5 m

Proposed FF Plan & Elevations

Rev B Dec 2020 Amended wall thickness & material choices

J M A D Architecture

www.jennymcintee.co.uk info@jmadarch.co.uk Tel 07921 003153

Project:	Proposed Dwelling	Date:	November 2020
Address:	88 Reservoir Road, Surfleet Seas End, Spalding PE11 4DH	Scale:	1:50 & 1:100 on A1
		drawn: TB JM	checked: JM
Client:	c / o JMAD Architecture	Job No:	20132
Drawing Title:	Proposed FF Plan & Elevations	Dwg No:	04B

Plan 5

N

E527640.00 E527660.00 E527680.00 E527700.00 E527720.00 E527740.00 E527760.00 E527780.00

N329200.00 N329180.00 N329160.00 N329140.00 N329120.00 N329100.00



NOTES

ABBREVIATIONS & SYMBOLS

AV	AIR VALVE	OHC	OVERHEAD CABLE
BH	BORE HOLE	PB	POST BOX
BOL	BOLLARD	PINV	PIPE INVERT LEVEL
CATV	CABLE TV MH	PM	PARKING METER
CCTV	SECURITY CAM	PO	POST
CL	COVER LEVEL	PT	PIPE TOP LEVEL
CH	CHANNEL	P/R	POST & RAIL FENCE
COL	COLUMN	P/W	POST & WIRE FENCE
DC	CABLE TV LID	RD	EDGE OF ROAD/NO KERB
DP	DOWN PIPE	RE	RODDING EYE/POINT
DR	DRAIN	RL	RIDGE LEVEL
EL	EAVES LEVEL	RP	REFLECTIVE POST
EP	ELECTRIC POLE	RS	ROAD SIGN
ER	EARTH ROD	SLVL	STONE LEVEL
FB	FLOWER BED	SOFF	SOFFIT LEVEL
FH	FIRE HYDRANT	SV	VALVE
FFL	FINISHED FLOOR LEVEL	SW	SURFACE WATER
FP	FLAG POLE	Tac	TACTILE PAVING
FW	FOUL WATER	TH	TRIAL HOLE
GV	GAS VALVE	TL	TRAFFIC LIGHTS
HW	HEADWALL	TLVL	TARMAC LEVEL
IC	INSPECTION COVER	TOW	TOP OF WALL LEVEL
IL	I NVERT LEVEL	TP	TELEGRAPH POLE
KB	KERB BOTTOM	TRK	TRACK
KO	KERB OFFLET	UTL	UNABLE TO LIFT
KT	KERB TOP	VP	VENT PIPE
LP	LAMP POST	WL	WATER LEVEL
LC	LIGHT COLUMN	WLVL	WATER LEVEL
MH	MANHOLE	WM	WATER METER
MP	MARKER POST	WO	WASH OUT POINT

FENCE, HEDGE, ELECTRIC, BANK EDGE, STORM LINE, FOUL LINE, TELECOM LINE, GAS LINE, LARSON PILES, CHANNELS, WATER MAIN

TREE, BOREHOLE, STATION, TBM, MANHOLE, GULLY, BATTER, WATER LVL, GATE

1. THE POSITION OF THIS SURVEY IS BASED ON GPS OSTN15 GRID.

2. ALL LEVELS RELATE TO GPS DATA ACQUIRED WITH TRIMBLE VRS.

3. TREES SPREADS ARE DRAWN TO SCALE AND SHOW THE GENERALAVERAGE CANOPY SPREAD.

4. ALL BELOW GROUND LEVEL INFORMATION INCLUDING VOIDS, DRAINAGE & SERVICES HAVE BEEN IDENTIFIED FROM THE SURFACE LEVEL ONLY, THEREFORE PIPE SIZES ETC ARE ESTIMATIONS ONLY. ALL CRITICAL DIMENSIONS SHOULD BE CHECKED PRIOR TO THE COMMENCEMENT OF ANY SITE WORKS

5. EVERY EFFORT HAS BEEN MADE TO LOCATE AND SURVEY ALL VISIBLE FEATURES. IT SHOULD BE NOTED THAT SOME ITEMS MAY HAVE BEEN OBSCURED AT THE TIME OF THE SURVEY AND THEREFORE NOT SHOWN ON THIS DRAWING.

6. PHYSICAL BOUNDARY FEATURES SHOWN ON THIS DRAWING DO NOT NECESSARILY REPRESENT THE ACTUAL LEGAL BOUNDARIES. THIS INFORMATION SHOULD BE CONFIRMED WITH THE RELEVANT DOCUMENTATION.

7. THE CONTRACTOR MUST CHECK AND VERIFY ALL SITE LEVELS, DIMENSIONS, UTILITIES AND DRAINAGE DETAILS PRIOR TO THE COMMENCEMENT OF ANY SITE WORKS. ANY DISCREPANCIES MUST BE NOTIFIED TO DANIEL CHARLES SURVEYS LTD.

8. ALL SURVEY STATION CONTROL POINTS MUST BE CHECKED BY THE CONTRACTOR PRIOR TO STARTING ANY SITE WORKS.

SURVEY CONTROL POINT INFORMATION.

Point	Easting	Northing	Elevation
9000	527695.297	329113.460	4.955
9002	527728.384	329133.917	5.103
9003	527744.291	329157.200	5.416
9004	527725.371	329138.420	5.047
9005	527707.818	329172.883	3.977

SURVEY DATE	12/10/2020	INITIALS	MJW

REV	AMENDMENTS	DRN	DATE

Client:
JMAD ARCHITECTURE

Project Title:
88 RESERVOIR ROAD
SURFLEET SEAS END
SPALDING - LINCS

Drawing Title:
TOPOGRAPHICAL SURVEY

Scale @ A1:	Date:
1:200	12/10/2020
Drawing No: 20 - 196 - 01	Rev:
C.A.D.Title: jmad 88 reservoir rd surfleet seas end\master topo (20-196-01).mjo	
Drawn By: MJW	Checked By: SRW

Daniel Charles Surveys Ltd
Land Surveying & Engineering Services
Honeywood Barn, Honeyholes Lane,
Dunholme, Lincoln, LN2 3SU
Tel : 01673 860444 Fax : 01673 863362
E-mail : info@daniel-charles.co.uk
Website : www.daniel-charles.co.uk