

FLOOD RISK ASSESSMENT

PROPOSED MEETING HALL & FUNCTION ROOM
ELSOMS WAY,
PINCHBECK,
SPALDING,
LINCOLNSHIRE.
PE11 3UL



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FLOOD RISK ASSESSMENT FOR PROPOSED MEETING HALL & FUNCTION CENTRE, ELSOMS WAY, PINCHBECK, SPALDING, PE11 3UL. LINCOLNSHIRE.

INTRODUCTION

The Government has placed increasing priority on the need to take full account of the risks 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 (NPPF) March 2012, which identify 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.

Inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risk, but where development is necessary, making it safe without increasing flood risk elsewhere. Local Plans should apply 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 of the impacts of climate change.

The Environment Agency's flood maps show areas that are at risk, from fluvial and tidal flooding. These maps show the limits of the flood plain of the area which could be affected by flood events, over topping or breaching of flood defences. They are based on the approximate extent of floods with a 1% annual probability of exceedance (1 in 100-year flood) for rivers and 0.5% annual probability of exceedance (1 in 200-year flood) for coastal areas under present expectations or the highest known flood. However, they do not take into account of the presence of defences or the likelihood that flood return intervals will be reduced by climate change.

This Flood Risk Assessment has been prepared in support of the planning application and considers the risk of flooding from fluvial and tidal sources. It also considers the risks of localised flooding due to inadequate Foul and Surface Water Sewers, Failure of Reservoirs, Water Main pipe bursts, Sewer Blockages, Pump Failures or High Ground Water Table etc.

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APPLICATION SITE

The site is located off Elsoms Way, Pinchbeck, Spalding, Lincolnshire PE11 3UL within the administrative area of South Holland District Council. The National Grid Reference for the middle of the site for the Function Centre is TF26038 25466. **Plan 1**

The current outline planning application is for the erection of a single storey Function Centre & Meeting Hall, of approximately 550 m², on land which is located off Spalding Office Park.

The Site would be classed a Non- Major Development applying the National Planning Policy Guidance (NPPG) as the site is to be developed for less than 1000m².

The National Planning Policy Framework Technical Guidance NPPF 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 proposed development site is shown to be 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 NPPF. **Map1**

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

Flood Zone 3 – High Probability
Definition This zone comprises land assessed as having a 1 in 100 or greater annual probability of river flooding (>1%), or a 1 in 200 or greater annual probability of flooding from the sea (>0.5%) in any year.
Appropriate uses The water-compatible and less vulnerable uses of land (Table 2) are appropriate in this zone. The highly vulnerable uses should not be permitted in this zone. The more vulnerable uses and essential infrastructure should only be permitted in this zone if the Exception Test is passed. Essential infrastructure permitted in this zone should be designed and constructed to remain operational and safe for users in times of flood.
Flood Risk Assessment requirements All development proposals in this zone should be accompanied by a Flood Risk Assessment.
Policy aims In this zone, developers and Local Authorities should seek opportunities to: • Reduce the overall level of flood risk in the area through the layout and form of the development and the appropriate application of sustainable drainage systems; • Relocate existing development to land in zones with a lower probability of flooding; and • Create space for flooding to occur by restoring functional floodplain and flood flow pathways and by identifying, allocating and safeguarding open space for flood storage.

Applying the Flood Risk Vulnerability Classification in Table 2 of NPPF the proposed commercial development is classified as "Less Vulnerable", with Table 1 of NPPF stating that such uses are appropriate in this zone.

Table 2: Flood Risk Vulnerability Classification

Less Vulnerable
• Police, ambulance and fire stations that are not required to be operational during flooding. • Buildings used for shops, financial, professional and other services, restaurants and cafes, hot food takeaways, offices, general industry, storage and distribution, non-residential institutions not included in "more vulnerable", and assembly and leisure. • Land and buildings used for agriculture and forestry. • Waste treatment (except landfill and hazardous waste facilities). • Minerals working and processing (except for sand and gravel working). • Water treatment works that do not need to remain operational during times of flood. • Sewage treatment works (if adequate measures to control pollution and manage sewage during flooding events are in place).

From the topographical survey the original ground level varied from 3.18mODN on the southern boundary to 3.42mODN on the northern boundary, averaging 3.30mODN with the office ground floor level 3.55mODN. The site, when the nearby car showroom was constructed the surplus excavated material was deposited on the site with an average level of 4.60mODN. This spoil is to be removed and the site brought back to the original ground level. **Plan 2**

The Environment Agency recommends that for "less vulnerable" developments in Flood Zone 3a, shall be determined by the flood depths arising from 2115 0.5% breach scenario. The floor level should be raised as high as practicable (minimum of 300mm above existing Ground level)

It is proposed that the ground floor level of the building be raised 300mm above the existing ground level to a minimum level of 3.60mODN.

DRAINAGE AUTHORITIES

Environment Agency

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

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

- From the River Welland
- Welland & Deepings Internal Drainage Board system

The Flood Zone Maps identify river catchments over 3 sq. km. These maps are a theoretical estimate of areas that could be inundated should no defence exist. In practice current standards of protection would result in flood envelopes substantially less than shown by these maps. The maps make no allowance for local, site specific features.

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. **Map 1**

The National Flood Risk Assessment Map shows that the site is at Medium risk of flooding. Medium means that each year, this area has a chance of flooding of less than 1 in 30 (3.3%) but greater than or equal to 1 in 100 (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 WELLAND

The River Welland lies some 370m to the east of the site which is tidal downstream of Marsh Lane Sluice and the present day 1 in 200-year tide flood level is 5.98mODN. The tidal flood defences of the tidal River Welland consist of earth embankments which are in good condition and the crest heights are circa 7.00mODN.

Breach Analysis to River Welland Tidal Defences

The following is taken from the Tidal Water Levels for the South Humber, East Coast and The Wash. **Map 3**

Peak tide levels Present Day (2006) at Marsh Lane Sluice 0.5% (1 in 200) = 5.98mODN.

Peak tide levels (2115) at Marsh Lane Sluice 0.5% (1 in 200) = 5.98mODN plus climate change of 1143mm (Climate Change Table 3) = 7.12mODN

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 value	Degree of flood hazard	Description	Indicative depth range
< 0.75	Low	Caution 'Flood zone with shallow flowing water or deep standing water'	Up to 0.25 m
0.75 – 1.25	Moderate	Danger for some (i.e. children) 'Danger: flood zone with deep or fast flowing water'	Up to 0.5 m
1.25 – 2.0	Severe	Danger for most 'Danger: flood zone with deep fast flowing water'	0.5 m to 3 m
> 2.0	Extreme	Danger for all 'Extreme danger: flood zone with deep fast flowing water'	0.5 m to over 3 m

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

Where V = Flood flow velocity (m/sec)

D = Flood depth (m)

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

Flood depth (m)	All areas (rural and urban)
≤ 0.25	0.5
> 0.25	1

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

This Flood Risk Assessment has taken the results from South East Lincolnshire Strategic Flood Risk Assessment (March 2017) Fluvial & Tidal Breach Mapping Appendix A, B & C.

From the Residual Flood Hazard, Depth and Velocity Spalding - Year 2006 1% Fluvial / 0.5% Tidal Event Probability maps, from the update of strategic flood risk assessment for South East Lincolnshire the site is not affected from a breach to the flood defences.

From the Residual Flood Hazard, Depth and Velocity Spalding - Year 2115 1% Fluvial / 0.5% Tidal Event Probability maps, included in the update of strategic flood risk assessment for South East Lincolnshire the site is partially affected from a breach to the flood defences. These maps make **allowance for** climate change, up to year 2115 and the maps show that part of the site is within a Low Hazard Rating area of Less than 0.75 (Low Hazard) remainder not affected, with depth of flow between 0.0m and 0.25m and velocity 0.0 – 0.3m/sec.

Map 4, Map 5 & Map 6 show the results for the most serve of the 1% Fluvial or the 0.5% Tidal Event

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 and updated in 2010. This was further updated for the South-East Lincolnshire local Plan in 2017

The findings reflect the considerable protection afforded to the area by coastal and tidal & fluvial flood defences and by the extensive well organised system of lowland IDB fluvial drainage.

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

Residual Flood Risk Extent Maps for 1% fluvial / 0.5% tidal event probability maps were developed for both the present day and Year 2115 and these maps have been used for this Flood Assessment:

Welland & Deepings Internal Drainage Board

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

The area originally drained solely to the Board's Pinchbeck Marsh Pumping station (TF 2620 2615). The station, built in 1952, initially was designed to serve a catchment of some 1,271 hectares comprising agricultural and urban areas. The station has a capacity of 1.5 cumecs and discharges into the Blue Gowt Outfall, which in turn has a gravity outfall into the River Glen.

As a result of the proposed expansion of the area for industrial development, the general expansion of Pinchbeck and to improve drainage for some agricultural land a scheme was undertaken in the early 1990's. The scheme diverted flows away from the Pinchbeck Marsh catchment to Pode Hole where it could be pumped by either the Fourth District or Pode Hole Pumping Stations.

During 2007/08 the Board constructed a new pumping station to augment the capacity at Pinchbeck Marsh and cater for the effects of further expansion and climate change within the area. The station currently provides 0.9 cumecs additional capacity with a total of 1.5 cumecs being available by early 2010. This will provide a total of 3.0 cumecs at Pinchbeck Marsh for a catchment of 978 hectares.

Vernatts Drain

The Board's Vernatts Drain bounds the southern side of the Wardentree Lane site. This channel is an embanked high-level carrier conveying the surface water runoff from some 16,165 hectares into the tidal River Welland at Surfleet Seas End.

During flood events all discharges into the Vernatts are pumped. Water levels at both ends of the channel are monitored and pumping would not continue to the extent that banks overtopped.

During the early 2000's the Board undertook a scheme to reinstate the banks to design standard and provide a minimum of 500mm to the design flood level of approximately 3.96m ODN

The design water level in the Blue Gowt Drain nearest the site for the 1:100-year event is 1.918m ODN (Taking into account climate change, development and pump improvements up to the year 2050).

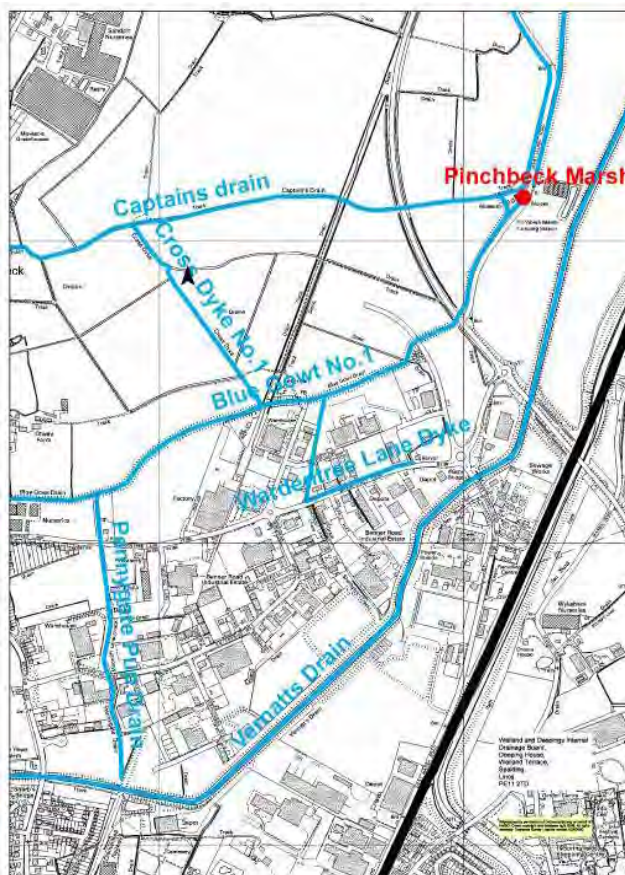
Other main sewers serving the site are located within the highway and are all believed to have been adopted by Anglian Water. They will have been designed in accordance with Sewers for Adoption and the Board's system has been (and will be) designed to cater for direct runoff flows.

Any surface water connections made to Anglian Water systems will need both Anglian Water and the Board's consent. The Board's consent will be conditional on payment of a development contribution for unattenuated flows.

Maintenance and Improvements

The Board regularly maintain their Pumping Stations, watercourses and pipelines and any defects noted are immediately repaired or programmed for repair/improvement. The Board have collected development

contributions from those sites directly discharging into the Board's system and this fund is, and will be, used towards financing any future improvements required.



Extract from Welland and Deepings IDB Drainage Map

SURFACE WATER FLOODING

The site is not shown on the Surface Water High Risk flood maps to be affected by surface water flooding. Very low risk means that each year this area has a chance of flooding of less than 1 in 1000 (0.1%). Flooding from surface water is difficult to predict as rainfall location and volume are difficult to forecast. **Map 7**

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 being flat, with no high ground around the site this will not cause any rapid inundation of the site and is likely only lead to local ponding of shallow depth and low velocity following the natural land contours. The building is also raised 300mm above the original average ground level. The updated SFRA concluded that flooding from this source is limited to minor isolated cases and is not of strategic significance as regards to flood risk.
- The area is not known to suffer from any groundwater problems and therefore is taken as having no strategic significance as regards to flood risk.

- Flooding from sewers can occur from over loading from heavy rainfall caused by blockages or having inadequate capacity. The resulting back pressure could cause foul sewage to flow from manholes which would flow over areas of the carriageway at a lower level and be contained within the confines of the kerb lines following the natural land contour to the south. The Updated SFRA concluded that flooding from sewers is limited to minor isolated cases and is not of strategic significance as regards to flood risk.
- 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.

SEQUENTIAL APPROACH

When applying the sequential approach for flood risk in accordance NPPF the site would fall into Zone 3a (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.

However, the results of the updated SHSFRA shows that the site is located within a medium probability flood zone, but the area is reliant on protection by flood defences providing a standard of protection of 1 in 100 years return period.

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

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	✓	✗	✗	✗

The Sequential and Exception Tests are not required as the site is located within area is designated as the major employment area for Spalding in the current and emerging local plan.

DRAINAGE STATEMENT

Surface Water

The Wardentree Business park development benefits from a new piped surface water drainage infrastructure

system, designed to accept all surface water directly from the site into the surface water piped system which was adopted by Anglian Water Services Ltd. It is proposed that a positive surface water drainage system be provided to serve the site and connected into the adopted drainage system

The adopted pipework system discharges into the Welland and Deepings Internal Drainage system to the north of the Business Park, which discharges to the Pinchbeck Marsh Pumping Station, which was upgraded to accept the positive discharge from the adopted system.

The Board have confirmed that they can accept the discharge from the proposed development, subject to a payment of their infrastructure charge at the rate applicable at the time of submission for a consent to discharge, in the event that the surface water discharge from the permitted development into the Board's drain exceeds the greenfield run-off rate of 1.4 litres/sec per hectare.

Anglian Water and the Welland & Deepings Internal Drainage Board's consent would be required for any surface water discharged into its system and agreement of the technical details.

Foul Water.

Foul water drains will be provided to serve the development and connected into the Anglian Water sewer.

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

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.

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 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 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

From Information requested from the Environment Agency the Main risk of flooding of the site is from the River Welland which is located some 350m east of the site and is tidal down stream of Marsh Lane Sluice, the 1 in 200-year tide flood level for year 2115 is 7.16mODN. (The Still Water Tidal Levels mODN - Tidal Model Analysis 2006 I in 200-year flood level is 5.98mODN + 1.14m climate change to 2115 taken from Table 3, = 7.12mODN). The tidal flood defences of the tidal River Welland consist of earth embankments which are in good condition and the minimum crest heights are 7.57mODN. This provides a protected freeboard of 400mm.

The left bank of the River Welland downstream of Marsh lane is formed by an earth bank which is provided with a soak dyke on the landward toe. The right bank to the River Welland upstream of Little London forms the embankment to the Cowbit Washes which allows water to overtop bank which consequently controls the river levels downstream during a high flow event. Further upstream there is a similar controlling flood storage washes at Crowland. The standard of protection provided by these defences is for the 1 in 100-year flood event.

FLOOD PROTECTION

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

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

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

- The lowest ground floor level for the building is to be raised 300mm above existing average ground level with a lowest level being 3.60mODN.
- Arrange for all service circuits at ground floor level to be routed at high level and where practical socket outlets, boilers etc. to be a minimum of 0.5m above the raised ground floor level.
- As this site is in an area that can receive flood alerts 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 warnings 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

- o The proposed development site is shown to be within Flood Zone 3a 'High Probability' as detailed on the Environment Agency's Flood Zone Maps without defences.
- o The site does have the protection of fluvial flood defences which are well maintained by the Environment Agency.
- o The Residual Flood Hazard, Depth and Velocity Spalding - Year 2115 1% Fluvial / 0.5% Tidal Event Probability maps, included in the update of strategic flood risk assessment for South East Lincolnshire show that the site is partially affected from a breach to the flood defences. These maps make **allowance for** climate change, up to year 2115.
- o The maps show that part of the site is within a Hazard Rating area of Less than 0.75 (Low Hazard) remainder not affected, with depth of flow between 0.0m – 0.25m and velocity 0.0 – 0.3m/sec.
- o The ground floor level for the building is to be raised 300mm above the existing average ground level with the lowest level being 3.60mODN, which is considered to be above the 2115 climate change breach level at the site.
- o The Flood Risk Vulnerability Classification in Table 2 of NPPF Technical Guide the proposed residential development is classified as "More Vulnerable", with Table 1 of NPPF Technical Guide stating that such uses are appropriate in this zone. However, the results of the updated SHSFRA shows that the site is located within a medium probability flood zone, but the area is reliant on protection by flood defences providing a standard of protection of 1 in 100 years return period.
- o Any impact of damage to the properties can be foreseen and mitigated against by relatively simple design, including such flood resilient materials and using such flood resistant construction techniques as appropriate for the building's location.
- o Flooding from other sources is unlikely to affect the site.

APPENDIX

Map 1	Extract from Environment Agency Flood Zone
Map 2	Flooding from Rivers & Sea Map
Map 3	Tidal Model Analysis 2006 Map
Map 4	South Holland SFRA Residual Flood Hazard Spalding year 2115 1% Fluvial/0.5% Tidal Event Probability
Map 5	South Holland SFRA Residual Peak Depth Spalding year 2115 1% Fluvial/0.5% Tidal Event Probability
Map 6	South Holland SFRA Residual Peak Velocity Spalding year 2115 1% Fluvial/0.5% Tidal Event Probability
Map 7	Surface Water Flood Map
Plan 1	Location Plan
Plan 2	Site Layout Plan
Plan 2	Topographical Survey

Flood map for planning

Your reference

Elsom Way

Location

526029/325448

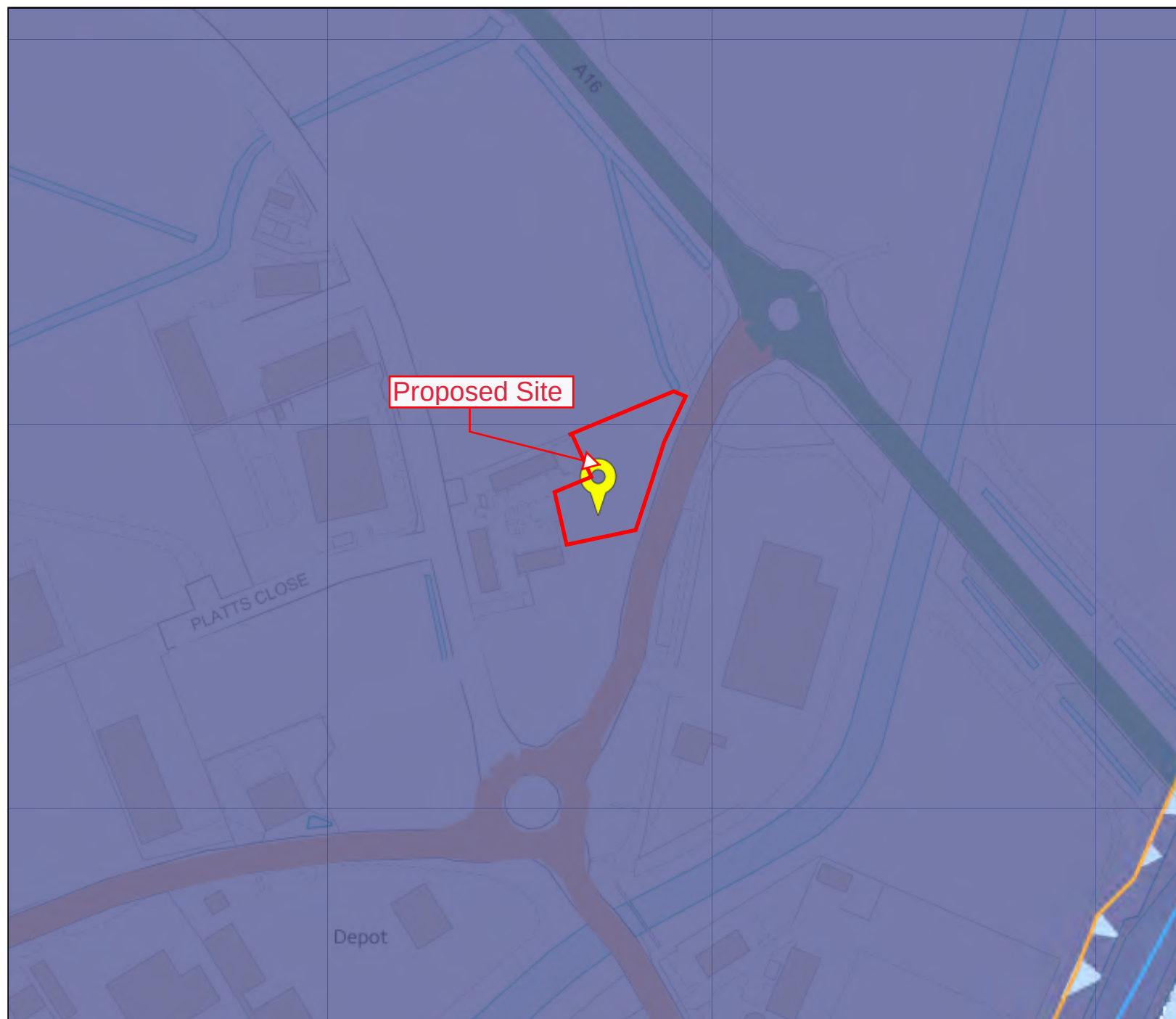
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-  Development location
-  Flood zone 3
-  Flood zone 3: areas benefitting from flood defences
-  Flood zone 2
-  Flood zone 1
-  Flood defence
-  Main river
-  Flood storage area





- Flood risk from rivers or the sea

 - ☒ Extent of flooding
 - ☐ Depth and flow estimates at monitoring stations
- Flood risk from surface water

 - ☐ Extent of flooding
 - ☐ High risk: depth
 - ☐ High risk: velocity
 - ☐ Medium risk: depth
 - ☐ Medium risk: velocity
 - ☐ Low risk: depth
 - ☐ Low risk: velocity
- Flood risk from reservoirs

 - ☐ Extent of flooding
 - ☐ Flood depth
 - ☐ Flood speed



Flood risk

- High
- Medium
- Low
- Very low

Location you selected

Map 2

Environment
Agency

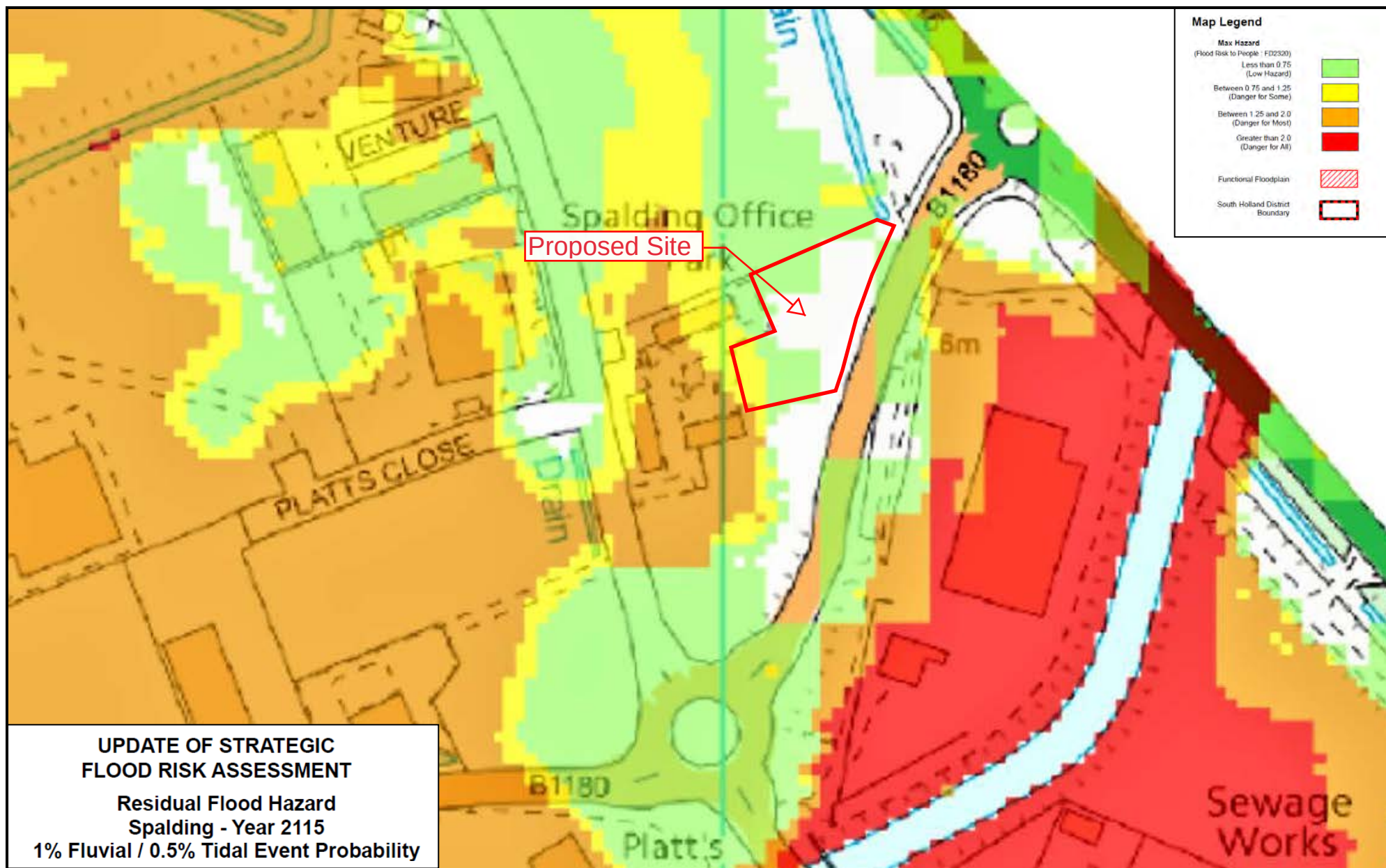


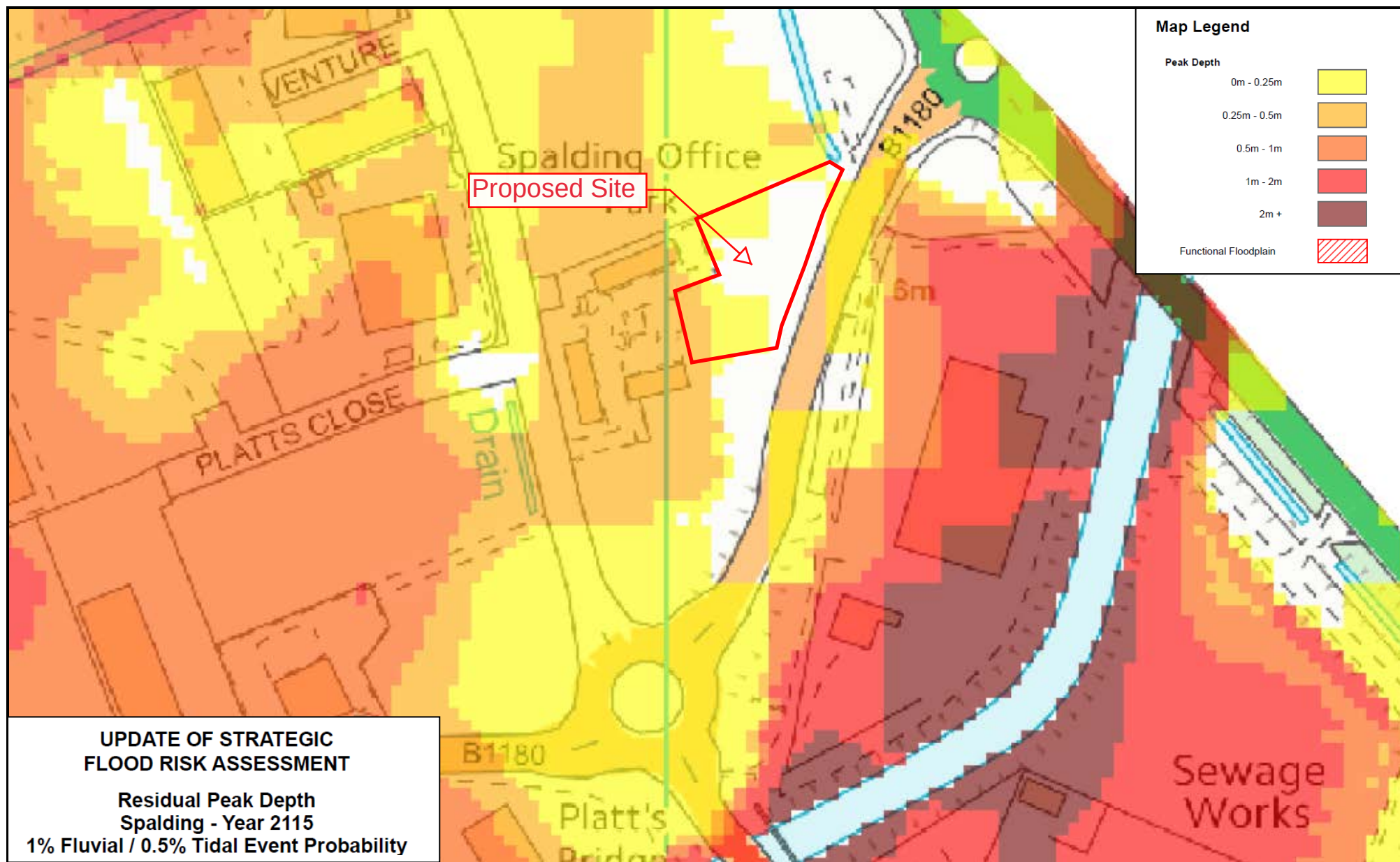
Tidal Water Levels for the South Humber, East Coast and The Wash

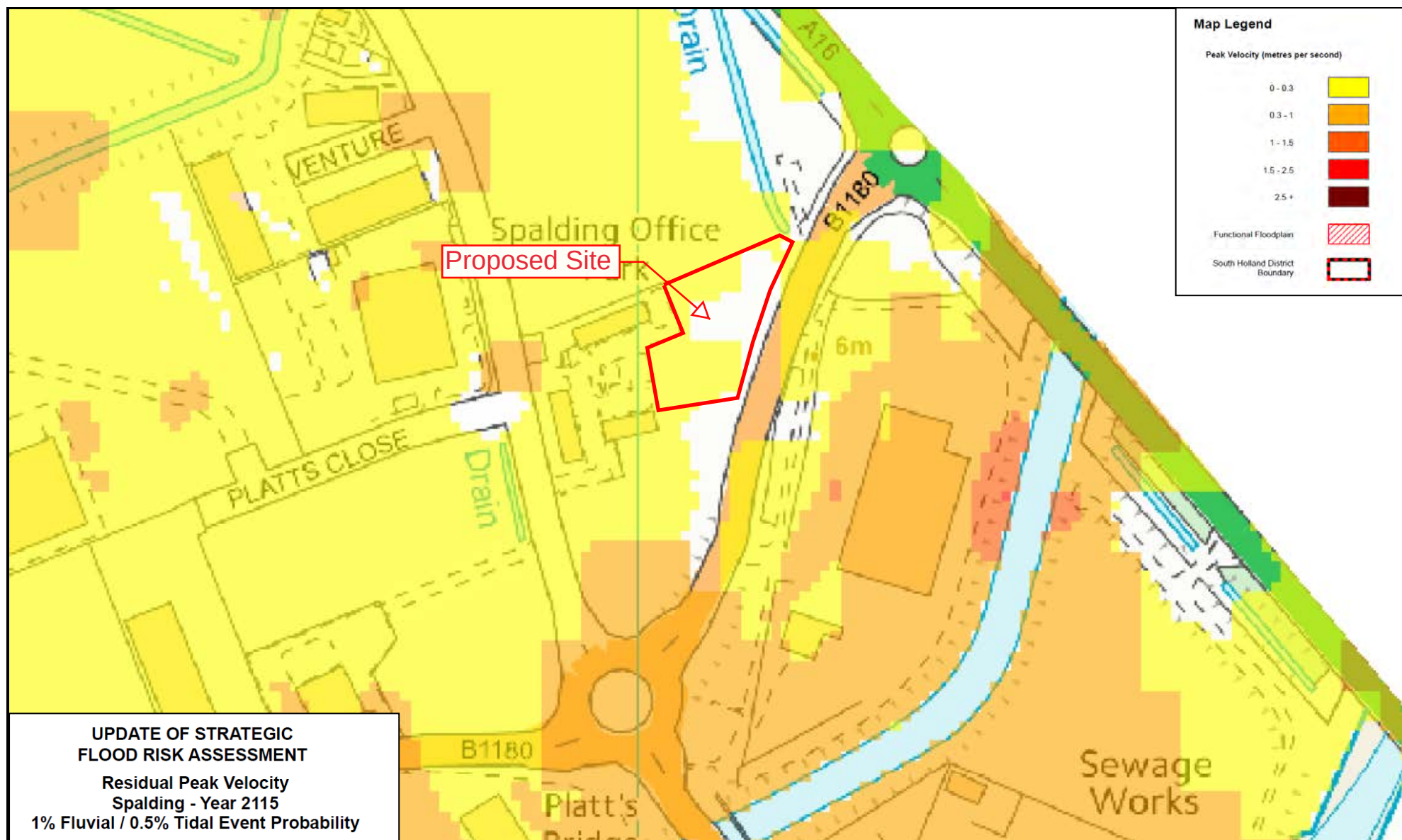
The table below shows still water levels for locations, from the above location map, around the South Humber Estuary, East Coast and The Wash. It is important to note the following:

- The base date for the data is 2014 for the South Humber and 2006 for the East Coast and The Wash.
- The data 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.
- The water level quoted is the ‘Best Estimate’ water level. Depending on the use of the data it may be necessary to carry out sensitivity testing. Upper and Lower 95% confidence bandings are available upon request.
- Levels for other annual chance scenarios are available if required.

Ref	Location	Easting	Northing	Annual Chance (1 in x) of Tide Level					
				metres ODN					
				1	10	50	100	200	1000
HUMBER									
H030	Tetney	535420	403180	3.94	4.29	4.56	4.69	4.82	5.15
H050	Buck Beck	532700	406580	4.03	4.36	4.62	4.74	4.87	5.18
H060	Grimsby	527878	411346	4.10	4.43	4.70	4.82	4.95	5.27
H080	Haborough Marsh	520790	415740	4.26	4.61	4.88	5.01	5.14	5.47
H090	Immingham	519141	417449	4.26	4.61	4.88	5.01	5.14	5.47
H100	South Killingholme	518700	417120	4.41	4.77	5.05	5.18	5.32	5.66
H130	North Killingholme	516530	420000	4.51	4.87	5.15	5.28	5.42	5.77
H150	East Halton	514450	422870	4.59	4.96	5.25	5.39	5.53	5.89
H170	Goxhill	511970	425440	4.67	5.04	5.34	5.47	5.61	5.95
H200	New Holland	508020	424330	4.87	5.26	5.55	5.68	5.81	6.12
H210	Barrow Haven	506380	422620	4.92	5.31	5.60	5.73	5.86	6.17
H220	Ferriby	497550	421150	5.04	5.42	5.67	5.77	5.86	6.04
H230	Winterton	493420	422830	5.14	5.51	5.74	5.83	5.90	6.02
H250	Blacktoft	484247	424190	5.25	5.62	5.83	5.90	5.96	6.04
H270	Goole	474857	422960	5.46	5.85	6.07	6.15	6.21	6.29
East Coast									
~	Great Eau	545500	393800	3.80	4.19	4.46	4.57	4.69	4.96
~	Boygrift	553300	379800	3.84	4.24	4.53	4.65	4.77	5.05
~	Burgh Sluice	555190	358620	4.26	4.45	4.76	4.90	5.03	5.34
Wash									
~	Hobhole	536610	339940	4.82	5.30	5.64	5.78	5.93	6.27
~	Lawyers Sluice	540750	334550	4.84	5.32	5.66	5.80	5.95	6.29
~	West Lighthouse	549150	325750	4.88	5.37	5.71	5.86	6.01	6.35
~	Grand Sluice	532400	344500	4.88	5.33	5.65	5.78	5.93	~
~	Fosdyke Bridge	531700	332200	4.91	5.38	5.71	5.85	5.99	~
~	Marsh Road	526000	324000	5.04	5.44	5.73	5.85	5.98	~
~	Wisbech	546100	310000	4.83	5.25	5.53	5.66	5.78	~
~	Dog In Doublet	527300	299300	3.67	4.00	4.22	4.32	4.42	~





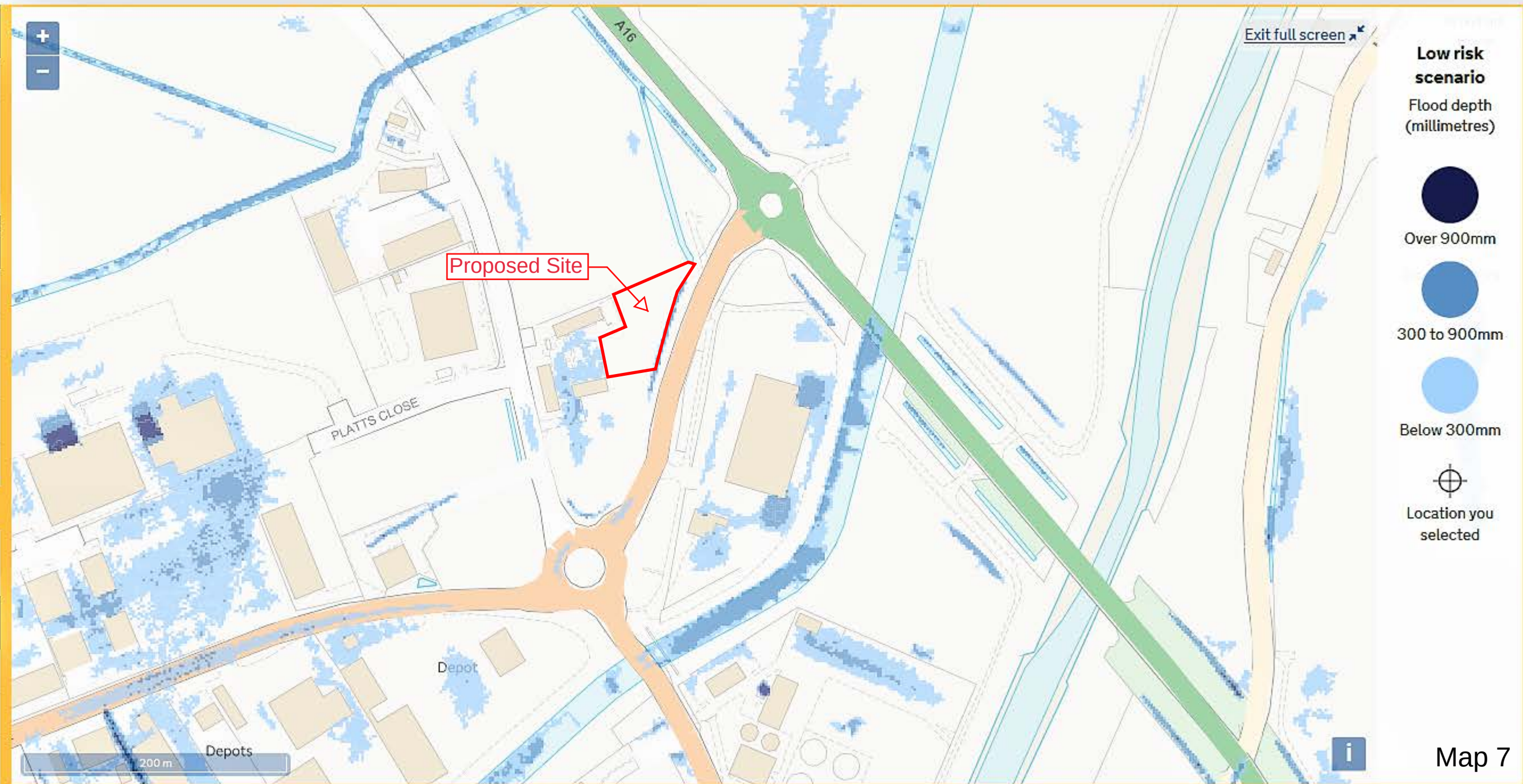


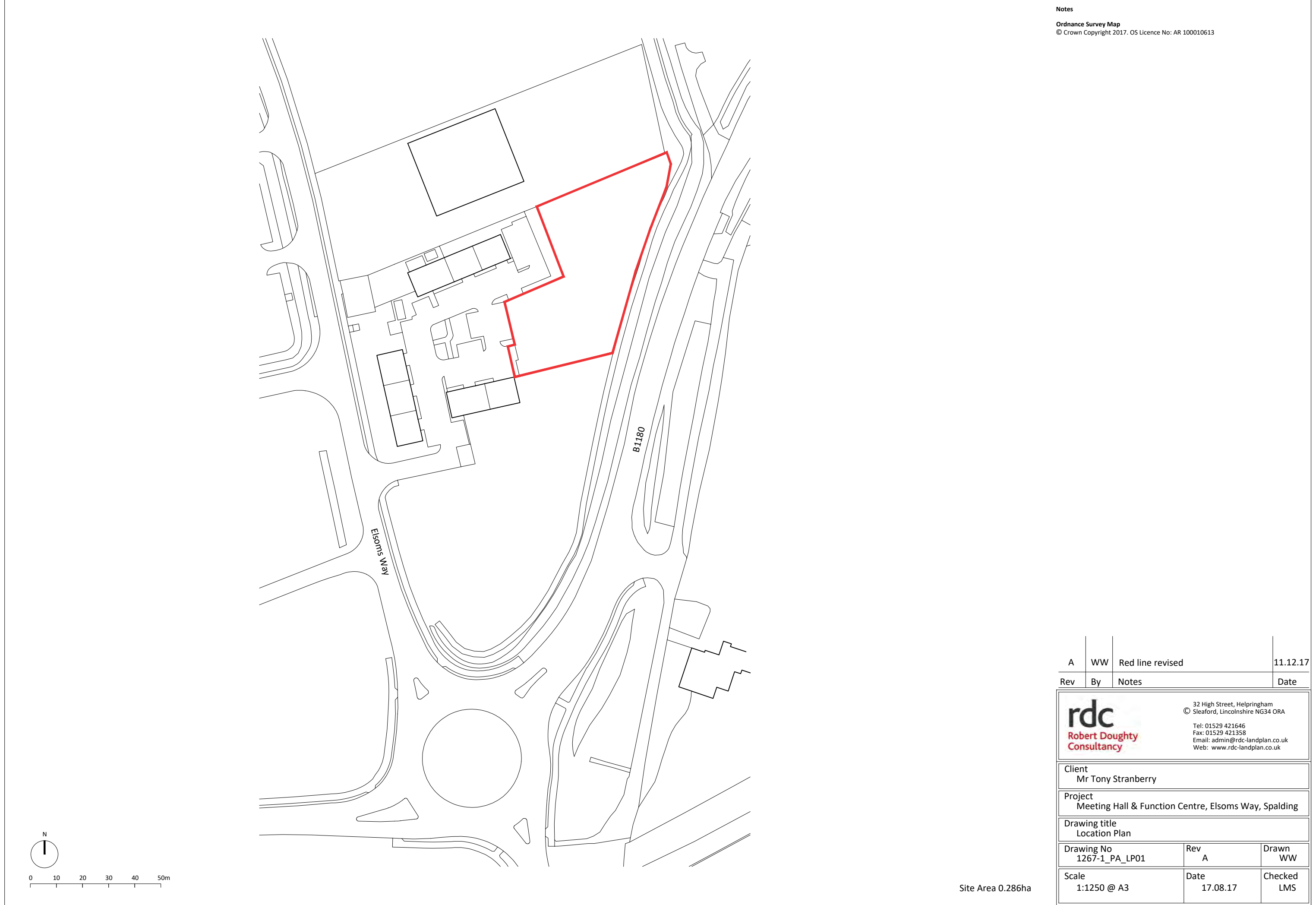
-  Flood risk from rivers or the sea

 - ☐ Extent of flooding
 - ☐ Depth and flow estimates at monitoring stations
-  Flood risk from surface water

 - ☐ Extent of flooding
 - ☐ High risk: depth
 - ☐ High risk: velocity
 - ☐ Medium risk: depth
 - ☐ Medium risk: velocity
 - ☒ Low risk: depth
 - ☐ Low risk: velocity
-  Flood risk from reservoirs

 - ☐ Extent of flooding
 - ☐ Flood depth
 - ☐ Flood speed





Notes
Ordnance Survey Map
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A	WW	Red line revised	11.12.17
Rev	By	Notes	Date

rdc Robert Doughty Consultancy 32 High Street, Helpringham © Sleaford, Lincolnshire NG34 0RA Tel: 01529 421646 Fax: 01529 421358 Email: admin@rdc-landplan.co.uk Web: www.rdc-landplan.co.uk		
Client Mr Tony Stranberry		
Project Meeting Hall & Function Centre, Elsoms Way, Spalding		
Drawing title Location Plan		
Drawing No 1267-1_PA_LP01	Rev A	Drawn WW
Scale 1:1250 @ A3	Date 17.08.17	Checked LMS

Site Area 0.286ha



Notes

Measurements
Do not scale from this drawing.
All measurements should be checked against on site conditions and any discrepancies should be brought to the attention of the Robert Doughty Consultancy.

Ordnance Survey Map
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CDM 2015
This drawing is for illustrative purposes and/or obtaining the relevant planning permission only. It should not be used for construction and accordingly, risk identification under the Construction (Design & Management) Regulations 2015 has not been undertaken.
that would require additional identification or explanation of risks remaining are detailed on this drawing and/or in the accompanying risk register.

Rev	By	Notes	Date
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Project Meeting Hall & Function Centre, Elsoms Way, Spalding			
Drawing title Indicative Site Plan			
Drawing No 1267-1_PL_SP01	Rev	Drawn WW	
Scale 1:500 @ A3	Date 29.01.18	Checked LMS	

Site Area 0.286ha

