

FLOOD RISK ASSESSMENT

Proposed Residential Development,
Land Adjacent to Fen Cottage,
Ralphs Lane,
Frampton West End,
Boston.
PE20 1QU.



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FLOOD RISK ASSESSMENT FOR PROPOSED RESIDENTIAL DEVELOPMENT, LAND ADJACENT TO FEN COTTAGE, RALPHS LANE, FRAMPTON WEST END, BOSTON, PE20 1QU.

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 July 2021, (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 on land adjacent to Fen Cottage, Ralphs Lane, Frampton West End, Boston, within the administrative area of Boston Borough Council. The National Grid Reference is TF32951 45235 **Plan 1**

This flood risk assessment has been prepared for an outline planning application to erect 2 No detached one & half storey dwellings with all sleeping at first floor level. **Plan 1**

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 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.

Table 1: Flood Zones Definition

Flood Zone 3- High Probability
<p>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.</p> <p>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.</p> <p>Flood Risk Assessments requirements. All proposals in this zone should be accompanied by a Flood Risk Assessment.</p> <p>Policy aims. Developers and local authorities should seek opportunities to:</p> <ul style="list-style-type: none">• reduce the overall level of flood risk in the area through the layout and form of the development and the appropriate application of sustainable drainage techniques.• relocate existing development to land with a lower probability of flooding.• create space for flooding to occur by allocating and safeguarding open space for flood storage.

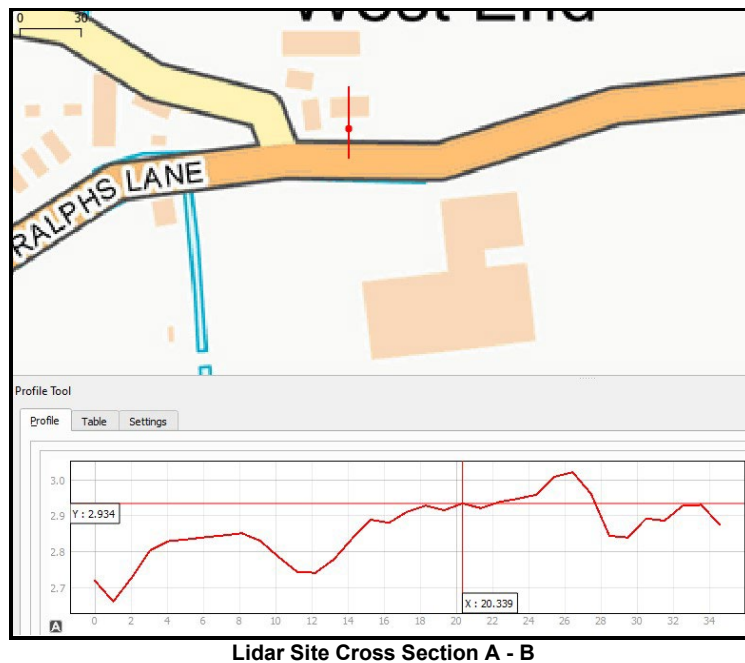
Applying the Flood Risk Vulnerability Classification in Table 2 of NPPG, the proposed residential use for the land is classified as "More Vulnerable," Table 1 of NPPG states that such uses are permitted in this zone, subject to the exceptions test.

Table 2: Flood Risk Vulnerability Classification

More Vulnerable
<ul style="list-style-type: none">• Hospitals• Residential institutions such as residential care homes, children's homes, social services homes, prisons, and hostels.• Buildings used for: dwelling houses; student halls of residence; drinking establishments; nightclubs; and hotels.• Non-residential uses for health services, nurseries, and educational establishments• Landfill and sites used for waste management facilities for hazardous waste.• Sites used for holiday or short-let caravan and camping, subject to a specific warning and Evacuation Plan.

Site Levels

Site levels, related to Ordnance Datum Newlyn, shows that land levels around the proposed site are circa 2.93mODN, Ralphs Lane is 2.88mODN.



[DRAINAGE AUTHORITIES](#)

[Environment Agency](#)

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

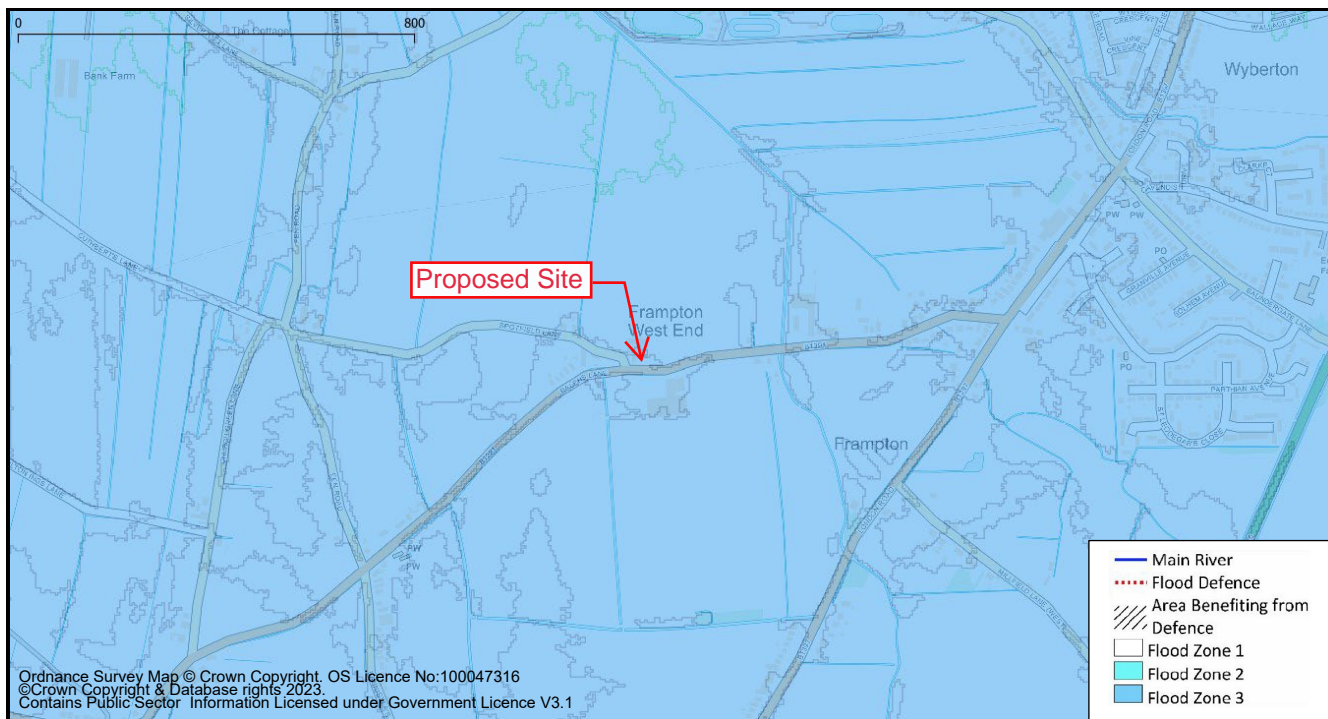
The following potential sources of flooding affecting the development site have been identified as:

- From the Boston Haven (Tidal)

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 the floodplain.

[Flood Zones](#)

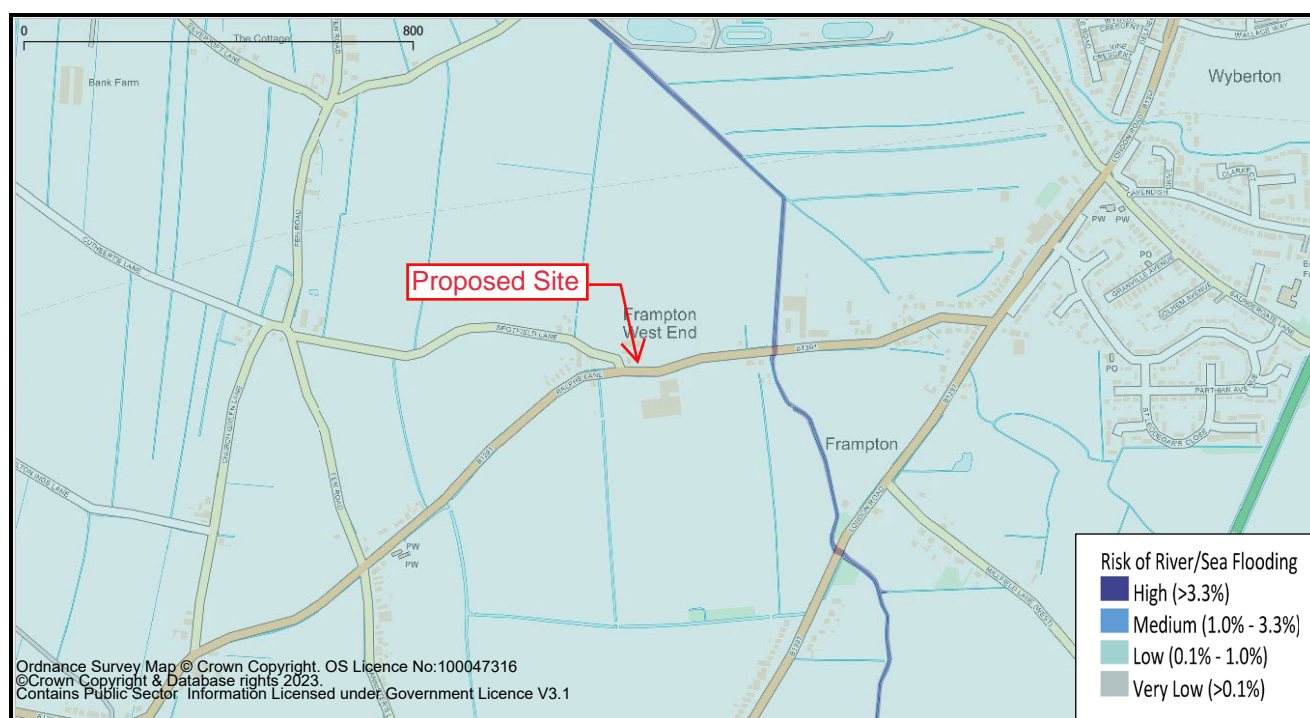
These maps show that the site is considered at risk from tidal/fluvial flooding as it is all located within an area zoned as Flood Zone 3. The maps indicate that the area would be flooded without flood defences, which are in place, (with an annual probability of more than 0.5% i.e., return frequency 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).



Flood Map for Planning (Source EA)

Risk of Flooding from Rivers & Sea

The Risk of flooding from Rivers and Sea shows that the site is at low risk. **Low risk** means that each year this area has a chance of flooding of between 0.1% and 1.0%. 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.



Risk of Flooding from Rivers and Sea Map (Source EA)

Fluvial Flooding

The site is not considered to be at risk of flooding from any main river.

Therefore, the main risk of flooding affecting the site is from a breach to the tidal defences.

The Tidal Defences

The Boston Haven is located some 3Km to the north-east of the site. The tidal defences protecting this site consist of embankments. They are in fair condition and reduce the risk of flooding 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.

Schemes in the Area

There are no ongoing capital projects to reduce or sustain the current flood risk to this site.

The Boston Combined Strategy (BCS) consists of five phases which will provide Boston town with a 1 in 300 (0.33%) annual chance standard of protection against tidal flooding over the next 100 years. This will be achieved through the provision of the tidal barrier which was completed in 2020 and initial improvements to the Haven banks downstream of Boston which were completed in 2021. Additional improvements will be required in the future to adapt to further sea level rise.

Tidal Flooding (Boston Haven)

The Environment Agency has constructed a tidal flood barrier downstream of the town of Boston, which is fully in operation and provides the Town with a 1 in 300 (0.33%) annual chance standard of protection against tidal flooding in 100 years.

This site however could be affected by either a breach or over topping of the defences downstream of the tidal barrier.

From Lincolnshire & Northamptonshire Area Tidal Modal Analysis, levels for East Coast and Wash: Immingham to the West Lighthouse. The base date for the data is 2017, which should be used in any consideration of future increases due to climate change. **Map 1**

Peak tide levels (2017) for the 1 in 200-year 50% confidence bound tide level is 6.09mODN at Boston Barrier
Peak tide levels (2124) tide level a is 6.09mODN +CC of 1072mm = 7.16mODN.

Taking the precautionary approach, the Hazard Rating following a breach which in Flood Risk Assessment (FD 2320) Guidance for New Development Phase 2 R& D Technical Report these are classified as low <0.75, moderate 0.75-1.25, significant 1.25-2.50 and extreme >2.50 based upon an empirical measure of velocity and depth.

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

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

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

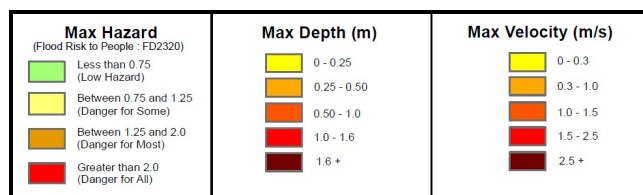
DF = A debris factor included to represent the greater damage, or risk of injury to people, that can occur if debris is swept along with the water. = 0.5 for depths <0.25 or 1.0 for depths greater.

Breach Analysis to Haven Tidal Defences

The Environment Agency has carried out a Tidal Hazard Mapping for the Haven following a breach to the defences. The Tidal Hazard Maps (2009) for Scenario year 2006 for the 1 in 200-year event show that the site is within a Hazard Rating area of Less than 0.75 (Low Hazard) depth 0 – 0.25m and velocity 0 – 0.3m/s.



Tidal Breach Maps for 1 in 200year Event Present Day (Source EA)



The Tidal Hazard Maps with climate change for Scenario year 2115 for the 1 in 200-year event show that the site is within a Hazard Rating area of between 1.25 – 2.0 (Danger for Most) depth 0.5 – 1.0m and velocity 0.3 – 1.0

m/s.



Tidal Breach Maps for 1 in 200year Event 2115 (Source EA)

The Environment Agency tidal overtopping maps confirms that site is not affected by overtopping for the 0.5% (1 in 200) and 0.1% (1 in 1000) chance events in 2006 or the 0.5% (1 in 200) and 0.1% (1 in 1000) events in 2115.

Floor levels

The minimum mitigation measures required for developments that do not have ground floor sleeping shall be determined by the flood depths arising from the 2115 0.5% breach scenario. The finished floor Level FFL of any new dwellings shall be informed by the flood depths.

Cell F7 of the South East Lincolnshire Standing Advice Matrix Flood Risk Mitigation Policy to ensure 'safe' development. requirements for FFL states:

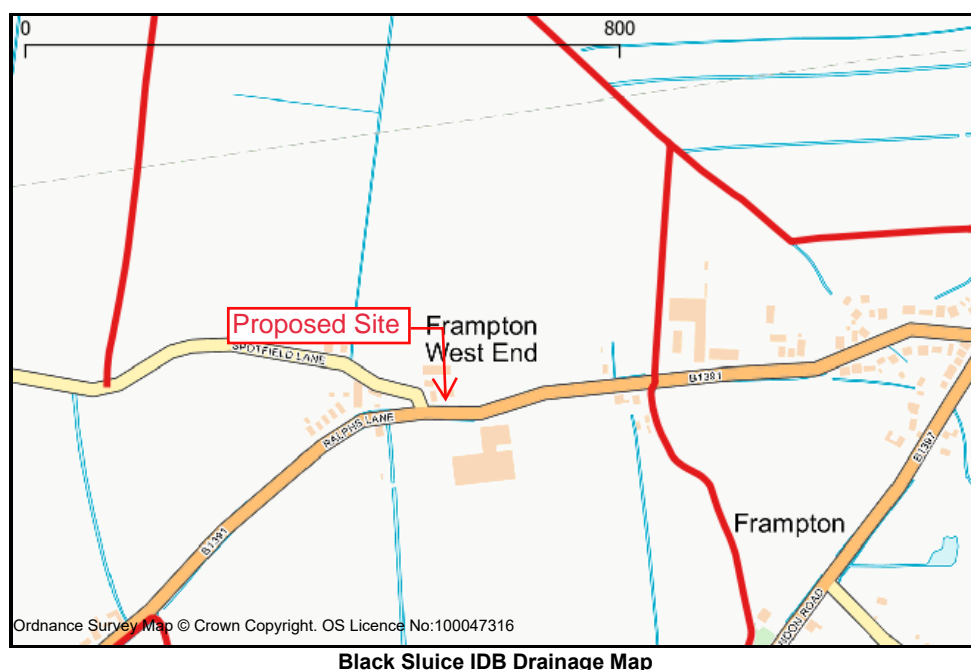
- Depths of 0.5 – 1.00m FFL to be set 1.00m above the existing ground level, with flood resilient construction incorporated to a minimum height of 300mm above the predicted flood level.
- The ground floor level is to be set at 3.93mODN.

With the properties being two storey, a safe refuge, accessed via an internal staircase, is provided at first floor level so as not to pose risk to life. Therefore, it is considered the proposals would comply the aims of the NPPF para.173 to ensure the development would be safe for it lifetime. There is no increase in flooding terms, to the residents.

BLACK SLUICE INTERNAL DRAINAGE BOARD

The proposed development site is located within the catchment area of Black Sluice Internal Drainage Board. The Board are therefore responsible to operate and maintain the arterial fluvial system.

The Board do not have any maintained watercourses to close to the site.



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. The ground floor level for the building is raised 1000mm above the existing ground level. It is concluded that flooding from this source is limited to minor isolated cases and is not of strategic significance as regards to flood risk.
- Groundwater flooding occurs when groundwater levels increase sufficiently for the water table to intersect the ground surface. Groundwater flooding can occur in a variety of geological settings including valleys, in areas underlain by chalk, and in river valleys with thick deposits of alluvium and river gravels. 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 area.
- 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

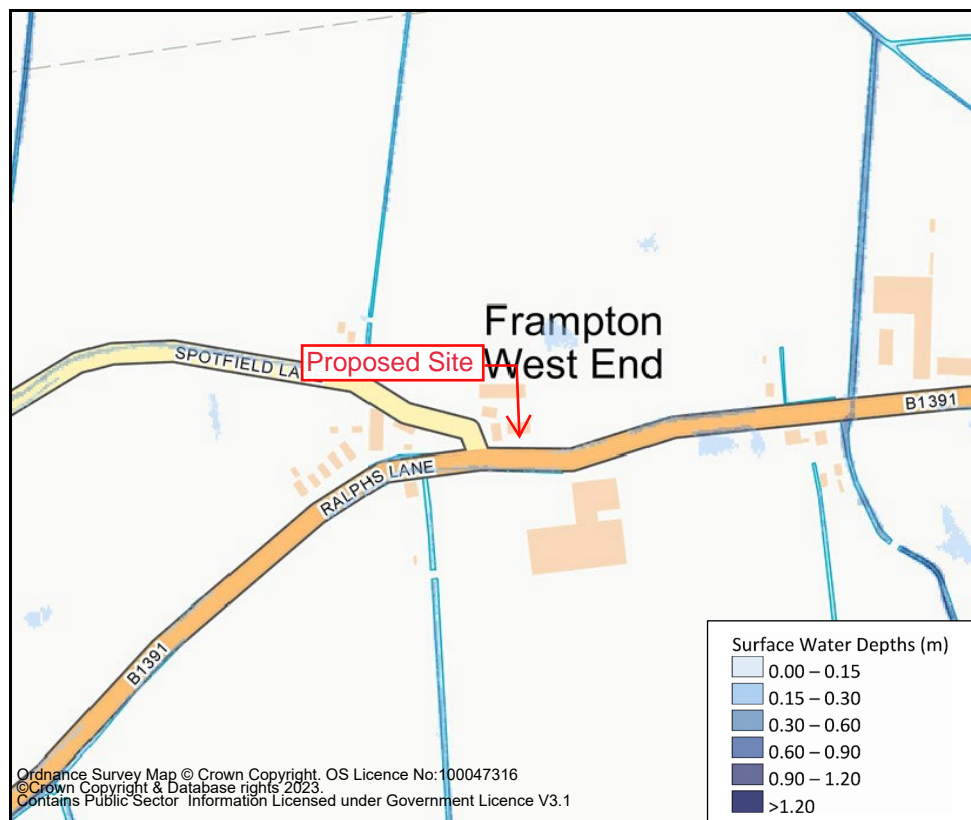
There is always a possibility of a flood more than that allowed for which might conceivably cause some flooding to the properties. However, such an event would have a very low probability and the risk of flooding to the property would be extremely small. It is therefore considered that the residual risks associated with flooding are not significant.

SURFACE WATER FLOODING

The proposed development site is shown on the Low-Risk scenario Surface Water flood maps, for the 1 in 1000-year event, for the western boundary to be affected from surface water flooding with a depth up to 300mm.

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%)



Risk of flooding From Surface Water Map (Source EA)

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 with low depressions shown to be affected.

There is a caveat contained in the Environment Agency “What is the Risk of Flooding from Surface Water Map Report version 2.0, April 2019, as to the use of these maps, which states that:- *“the map does not contain sufficient information for it to be used to determine flood risk to individual properties, but it does give you an indication of whether your area may be affected by surface water flooding and to what extent.”*

SEQUENTIAL APPROACH

When applying the sequential approach for flood risk in accordance NPPF the site of the development would fall into Flood Zone 3 (High Probability) as the site is shown to be within the tidal/fluvial 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 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	✓	✗	✗	✗

NPPF Guidance Paragraphs 165 - 179 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.

Sequential Test

The windfall site is located just outside the settlement boundary for Boston and Boston is a Sub Regional Centre in the South East Lincolnshire Local Plan. Development within Sub Regional Centres will be supported, providing it is within the settlement boundaries that will help fulfil their role. Boston is the largest urban area within the SELLP and the centre for local services, making the development within a highly sustainable location where new development is to be encouraged.

There are a variety of planning approvals (both planning applications and appeals) within the Borough that have been granted, in recent years, for small scale residential development, outside of settlement boundaries, providing they do not impact on the character and appearance of the local area.

Whilst the site is located outside a settlement boundary but it is important to consider the context of the site. The site is located adjacent to two existing dwellings to the west and to the north. Further dwellings are located to the west of Spotfield Lane. Therefore, the proposal would not lead to 'isolated homes' in the countryside. A recent judgement states that the term "isolated", for the purposes of the Framework should be taken as its ordinary dictionary meaning of far away from other places, buildings or people; remote. The proposed two dwellings would not be spatially or indeed socially isolated. They would be close to other buildings and the occupiers would be close to other residents.

The proposed residential development on the site, would not look out of keeping with surrounding development or the character of the area.

The whole of the surrounding area is shown on the Flood Map for Planning to be in Flood Zone 3 and there are no other sites in a lower flood zone.

The Environment Agency hazard depth mapping information is now required to be used to compare the application site against other sites within the Boston/Wyberton settlement boundary to determine if there are any other comparable development sites for 2 dwellings is currently available. There is the most need for housing within the regional sub centre, where local services are based and it is appropriate to search this catchment area rather than a Borough wide search.

The following sites are allocated within the SELLP., f
or Boston, as shown on Insert Map 1.

1. Sou 006 – Land to the south of Chain Bridge Road. Depth 1.0 – 1.6m
2. Wes 002 – Land to the south of North Forty Foot Bank, Boston. Depth 1.0 – 1.6m
3. Fen 006 – Land to the east of Fenside Road, Boston. Depth 1.0 – 1.6m
4. Fis 001 – Land to the east of Lindis Road, Boston. Depth 1.0 – 1.6m

5. Fis 017a – Land to the south of Wainfleet Road, Boston. Depth 1.0 – 1.6m
6. Fis 033 – Land to the west of Toot Lane, Boston. Depth 1.0 – 1.6m
7. Wyb 033 – Land to the north of Tyton Lane East, Boston. Depth 1.0 – 1.6m
8. Cen 001 – Land to the north of Whitehorse Lane, Boston. Depth 1.0 – 1.6m
9. Fen 001 – Land to the West of Fenside Road, Boston. Depth 1.0 – 1.6m
10. Fen 002 – Land to the north of Langrick Road, Boston. Depth 1.0 – 1.6m
11. Fis 002 – Land to the north-east of Fishtoft Road, Boston. Depth 1.0 – 1.6m
12. Fis 003 – Land to the east of White House Lane, Boston. Depth 1.0 – 1.6m
13. Fis 038 – Land to the west of Church Green Road, Boston. Depth 0.5– 1.0m
14. Nor 006 – Land to the west of Horncastle Road, Boston. Depth 0.5 – 1.0m
15. Pil 002 -Land to the south of Main Ridge East, Boston. Depth 0.5 – 1.0m
16. Pil 006 – Boston Delivery Office, South End, Boston. Depth 0.5 – 1.0m
17. Wes 001 – Land to the west of Freshney Way, Boston. Depth 1.0 – 1.6m
18. Wyb 013 – Land to the south of Swineshead Road, Boston. Depth 1.0 – 1.6m
19. Wyb 041 – 291-293 London Road, Boston. Depth 0.5 – 1.0m

All the above sites, which have been allocated, are not at a lesser flood risk than this windfall site (Depth 0.5 – 1.0m) which are available for development within the Boston Sub-Regional Centre Settlement boundary.

Based on the above research it is considered that the sequential test has been satisfied.

Exception Test

Paragraph 8 of the NPPF relates to sustainable development states what the three overarching objectives in achieving sustainable development that these three roles should not be undertaken in isolation because they are mutually dependent.

- I. **an economic objective** – to help build a strong, responsive and competitive economy, by ensuring that sufficient land of the right types is available in the right places and at the right time to support growth, innovation and improved productivity; and by identifying and coordinating the provision of infrastructure;
- II. **a social objective** – to support strong, vibrant and healthy communities, by ensuring that a sufficient number and range of homes can be provided to meet the needs of present and future generations; and by fostering well-designed, beautiful and safe places, with accessible services and open spaces that reflect current and future needs and support communities' health, social and cultural well-being; and
- III. **an environmental objective** – to protect and enhance our natural, built and historic environment; including making effective use of land, improving biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy."

With regard to the above, the development would provide some wider sustainability benefits to the community through a contribution (albeit small) towards housing supply for Boston Borough, and other benefits including

generating employment during the construction period and will provide wider sustainability benefits to the local community in helping the existing local and surrounding facilities, in neighbouring villages, long term viability.

It is therefore demonstrated above, that for this development the three objectives have been met and satisfies the first part of the test.

The flood risk assessment demonstrates that the development will be safe for its lifetime and it will not increase flood risk elsewhere, therefore, satisfies the second part of the test.

Therefore, the development is considered to pass both parts of the Exception Test.

CLIMATE CHANGE

Global warming is now recognised that it is likely to affect the frequency and severity of extreme events for both tidal and fluvial flooding. The Climate change allowances in the NPPF Guidance was updated on the 20th of July 2021. For flood risk assessments use the Management Catchment Climate Changes for the peak river flow map. Management catchments are sub-catchments of River Basin Districts.

Peak River Flow Allowances

The site is located within the Witham Management Catchment within the Anglian River Basin District, for sites within Flood Zone 2 or 3a and for “More Vulnerable” land uses, the Central allowances figures, in the Table below, should be used.

Peak River flow allowances within the Management Catchment Allowances				
River Basin District /Management Catchment	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/ Witham	Upper End	27%	32%	57%
	Higher Central	14%	15%	32%
	Central	9%	8%	21%

The effect of global warming on peak rainfall allowances is given in Table 1.

Table 1 Peak Rainfall Intensity

Table 1 Peak rainfall intensity allowance in small and urban catchments (1961 to1990 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 2.

Table 2 Peak Sea Level Rise

Table 2 Peak Sea level allowance for each epoch in (mm) per year with cumulative sea level rise for each epoch in brackets (use 1981 to 2000 baseline)						
Area of England) (Use River Basin	Allowance	2000 to 2035	2036 to 2065	2066 to 2095	2096 to 2125	Cumulative Rise 2000 to 2125 (m)
Anglian	Higher Central	5.8 (203mm)	8.7 (261mm)	11.6 (348mm)	13 (390mm)	1.20m
Anglian	Upper End	7 (245mm)	11.3 (339mm)	15.8 (474mm)	18.1 (543mm)	1.6m

SUSTAINABLE DRAINAGE STRATEGY

Surface Water Drainage

Applications for developments where the proposals will result in the increase the amount of surface water run-off require that an appropriate drainage strategy to be undertaken to ensure that the surface water discharge mimics the existing pre-development regime.

Any proposed surface water drainage system will need to be designed to account for the effects of climate change over the lifetime of the development. Based on the recommendations the proposed drainage systems should be sized for the critical 1 in 100-year storm event and to allow for a 40% increase in rainfall intensity for climate change.

In accordance with recognised guidance, Part H of the Building Regulations 2010 and National Planning Policy Framework, 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

- a) Domestic curtilage roof area – it is proposed to discharge this to underground pipes, where required, with silt traps incorporated prior to connecting to cellular crate soakaways designed in accordance with BRE 365. A water butt of at least 220L internal capacity shall be installed to intercept rainwater draining from the roof of each building, to reduce the risk of flooding and demand for water by recycling and to increase the level of sustainability of the development.
- b) The access and parking areas will be constructed using permeable materials to allow percolation into the ground as naturally occurs.

Foul Drainage

Foul drainage from the two properties will be collected in underground pipes in accordance with The Building

Regulations and to be connected to a package treatment unit.

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

FLOOD RESILIENCE CONSTRUCTION

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 level for the living accommodation will be raised 1.0m above the existing ground level (2.16mODN) set at 3.93mODN.
- Avoid the use of mineral fibre insulation to the ground floor and use a rigid closed cell material as these retain integrity and have low moisture take-up.
- 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.
- 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.
- 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 high level with drops to ground floor sockets and switches.
- The 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 0345 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 site for the site is shown to be within Flood Zone 3 'High Probability' as detailed on the Environment Agency's Flood Zone Maps without defences.
- The ground floor level for the living accommodation will be raised 1.0m above the existing ground level set at 3.93mODN.
- The Tidal Hazard Maps (2009) for Scenario year 2006 for the 1 in 200-year event show that the site is within a Hazard Rating area of Less than 0.75 (Low Hazard) depth 0 – 0.25m and velocity 0 – 0.3m/s. With climate change for Scenario year 2115 for the 1 in 200-year event show that the site is within a Hazard Rating area of between 1.25 – 2.0 (Danger for Most), depth 0.5 – 1.0m and velocity 0.3 – 1.0m/sec.
- In the event of a flood incident, the safest option would be for residents to remain in the building and use the internal staircase to make their way to the first-floor area which would provide a safe haven. Residents should not attempt to leave the building and make their way through flood water, unless instructed to do so by the emergency services.
- 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.
- It is therefore concluded that the proposed development can be constructed, safely and sustainably, to meet the requirements of the Boston Borough Council Development Plan Policies, and the National Planning Policy Framework.

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%	2.5%	50%
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

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://deframetadadata.com/geonetwork/srv/eng/catalog.search#/metadata/84a5c7c0-d465-11e4-b0bd-f0def148f590>

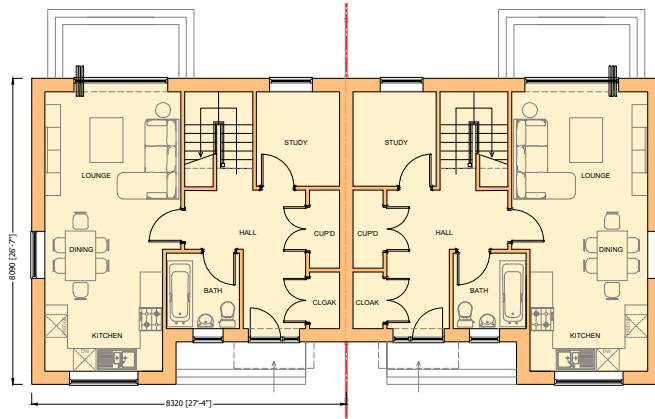
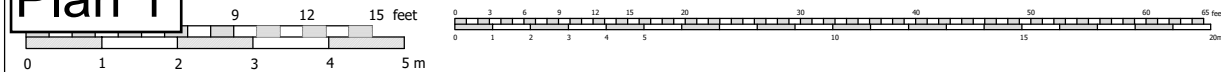
The following notes apply to all Marsh Road, Wisbech, Dog-in-a-Doublet

- 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.

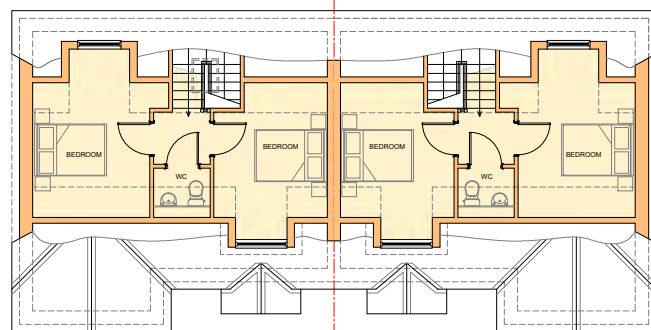
The following notes apply to Grand Sluice

- 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://deframetadadata.com/geonetwork/srv/eng/catalog.search#/metadata/84a5c7c0-d465-11e4-b0bd-f0def148f590>

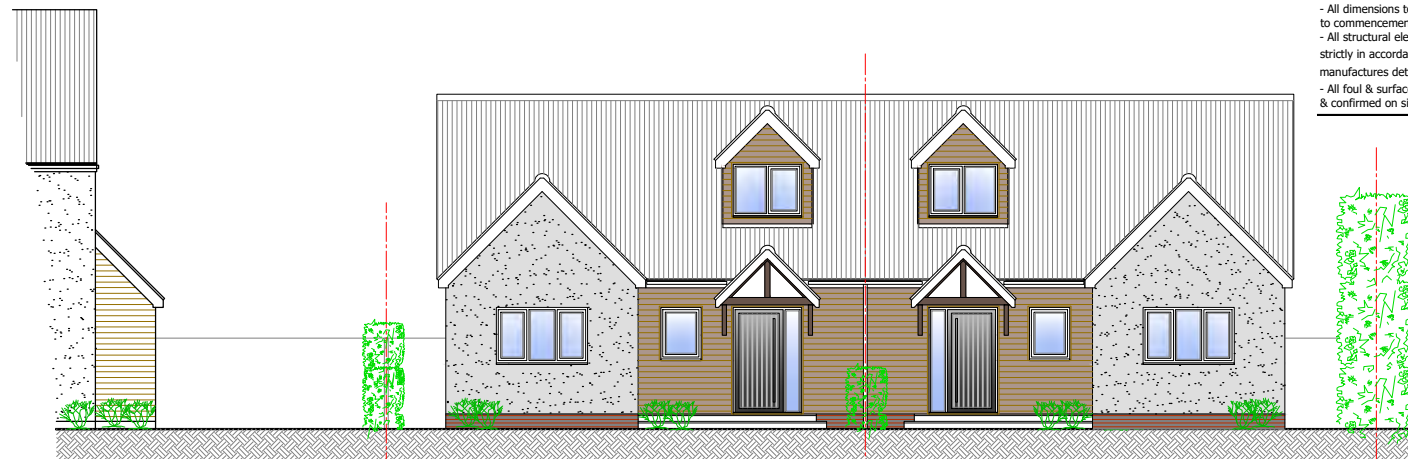
Plan 1



GROUND FLOOR SCALE 1:200



FIRST FLOOR SCALE 1:200

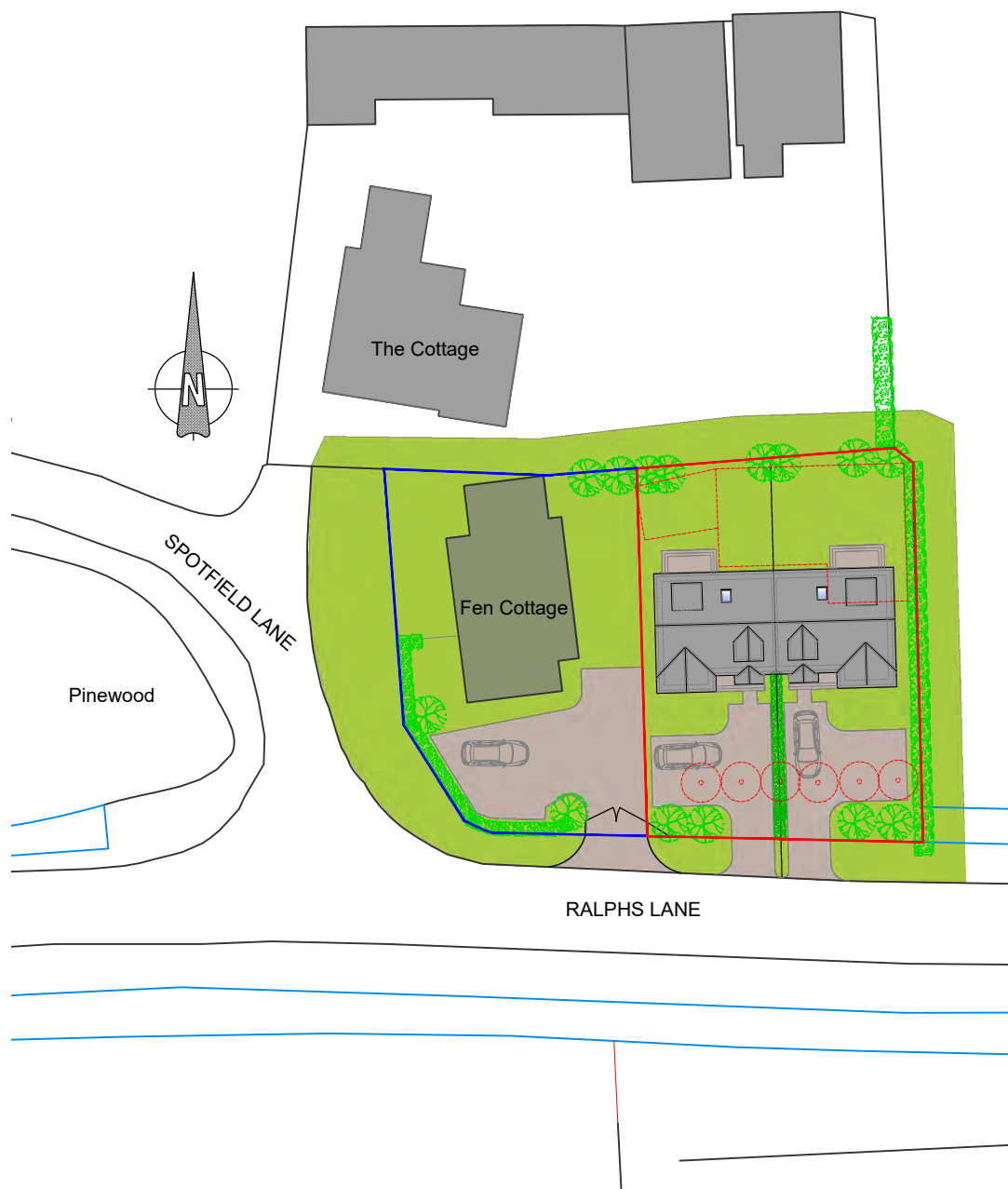


ELEVATION VISUAL

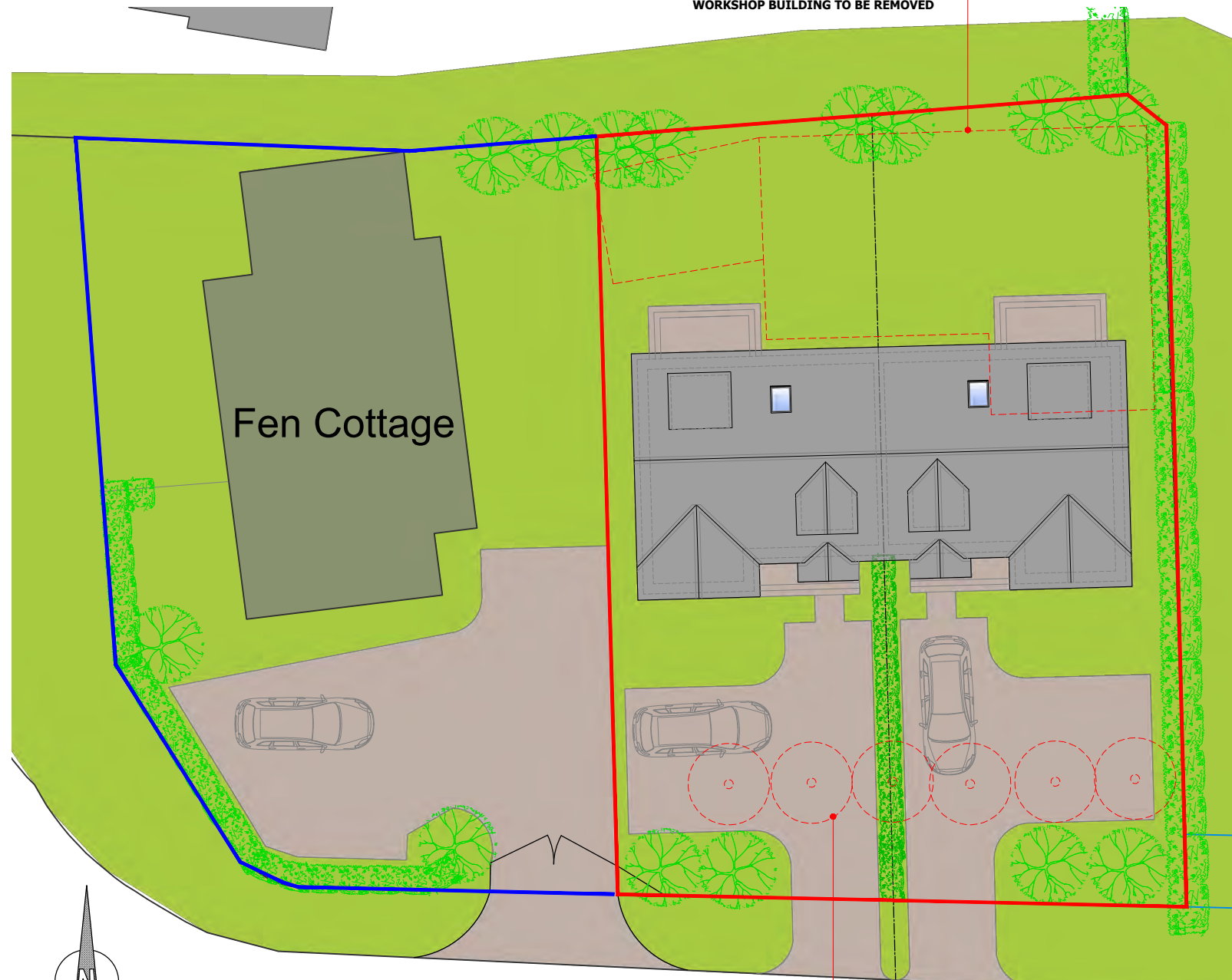
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Do Not Scale This Drawing

Notes:

- All dimensions to be checked & confirmed on site prior to commencement of works
- All structural elements to be checked & installed strictly in accordance with structural engineers & manufactures details & specifications.
- All foul & surface water drainage systems to be checked & confirmed on site prior to commencement of works.



BLOCK PLAN SCALE 1:500



SITE PLAN SCALE 1:200

OUTLINE OF EXISTING STORAGE/
WORKSHOP BUILDING TO BE REMOVED

6NO TREES TO BE REMOVED SUBJECT
TO FINAL RESERVE MATTERS SCHEME
DESIGN

TO BE READ IN CONJUNCTION WITH PLANNING, BUILDING REGULATION APPROVALS
AND STRUCTURAL ENGINEERS DETAILS AND SPECIFICATION AS NECESSARY

A	XXXXXX	00-00-2020
REV	Note	Date



ARCHITECTURAL
DESIGN

07930 915730 lee@lpcdesign.co.uk
www.lpcdesign.co.uk

Project/Site
**RESIDENTIAL DEVELOPMENT
ADJACENT TO**
Fen Cottage, Ralph's Lane,
Boston, Lincolnshire PE20 1QU

Client Mr Rickell

Dwg Title
**PROPOSE SITE, BLOCK
AND FLOOR PLANS**

Date	FEBRUARY 2024	Scale	As Shown @ A3
Dwg No	LPC-359-02	Revision	---

Drawing Status
PLANNING APPLICATION