

FLOOD RISK ASSESSMENT

Proposed Change of Use of Agricultural Barn
To Residential
Weston House Barn,
Wragg Marsh,
Spalding



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FLOOD RISK ASSESSMENT PROPOSED CHANGE OF USE OF AN AGRICULTURAL BARN TO REISIDENTIAL, WESTON HOUSE BARN, WRAGG MARSH, SPALDING

INTRODUCTION

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

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

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APPLICATION SITE

The site is located at Weston House Barn, Wragg Marsh, Spalding, PE12 6HQ, within the South Holland District Council's administrative area. The National Grid Reference is TF 29936 29138. **Plan 1**

This flood risk assessment has been prepared for an application under Prior notification Part 3 Class Q for a change of use of a building and any land within its curtilage from a use as an agricultural building to a use falling within Class C3 (dwelling houses) of the Schedule to the Use Classes Order, to provide a residential dwelling.

There is a small amount of demolition (the modern lean-to) **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 proposed development site is shown to be within an area of 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 Existing Barn is classified as “Less Vulnerable.” The proposed dwelling is classified as “More Vulnerable,” Table 1 of NPPG states that such use is permitted in this zone subject to the exception 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

From the topographical survey the site is reasonably level, with a slight fall north to south from 4.00mODN to 3.55mODN. Land levels immediately surrounding the building average 3.85mODN and the barn floor level is 4.31mODN. The road level at the site entrance, is 3.28mODN. **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.

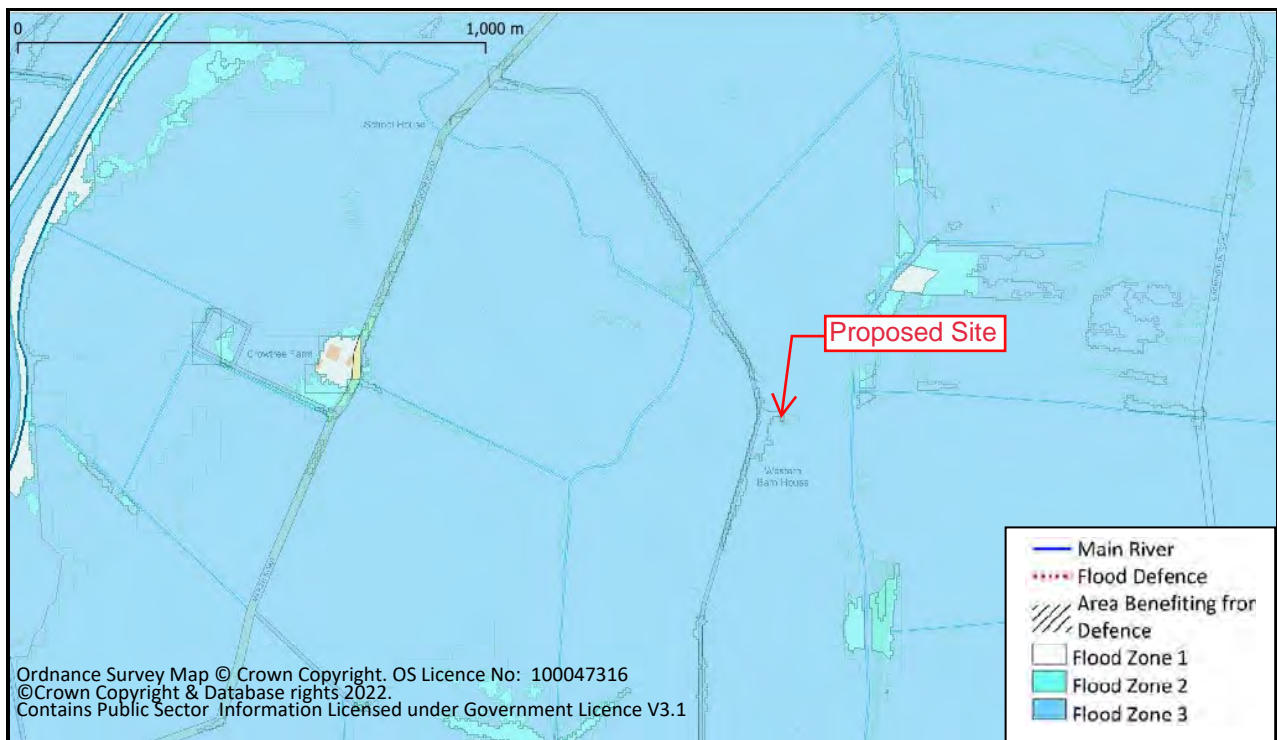
The following potential sources of flooding affecting the development site have been identified as:

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

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

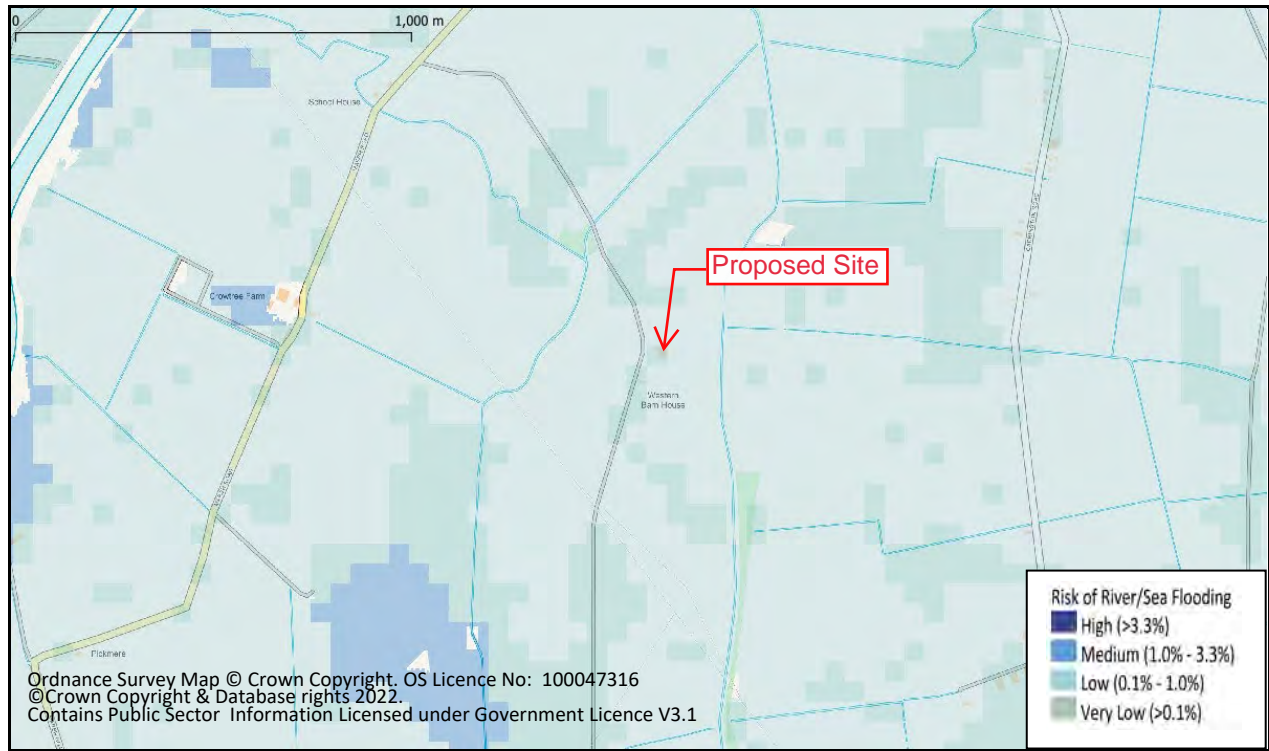
The flood zone maps indicate that the area would be flooded without flood defences.). The Flood Map indicates the area at risk of flooding, **assuming no flood defences exist**, for a flood event with a 0.5% chance of occurring in any year for flooding from the sea, or a 1% chance of occurring for fluvial (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



Flood Map for Planning (Source EA)

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 3a. The maps indicate that the area would be flooded, without flood defences, which are in place, (with an annual probability of more than 0.5% i.e., return frequency of less than 1 in 200 years for tidal flooding or more than 1.33% return frequency of less than 1 in 100 years for fluvial flooding).



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

The Risk of flooding from Rivers and Sea map shows the site for the development, to be at Medium Risk. Medium means that each year, this area has a chance of flooding between 1% and 3.3%. 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.

Fluvial Flood Risk

This site is not considered to be at risk of flooding from main rivers.

Schemes in the Area

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

The River Welland Tidal Defences

The River Welland is located some 1.50Km northwest of the site, and is tidal down stream of Marsh Lane Sluice. The tidal defences protecting this site consist of earth embankments, the crest heights are circa 7.00mODN. They are in fair condition and reduce the risk of flooding (at the defence) to a 1% (1 in 100) chance of occurring in any year. The Environment Agency inspect these defences routinely to ensure potential defects are identified.

Breach Analysis to the 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.

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

HR = d x (v + 0.5) +DF

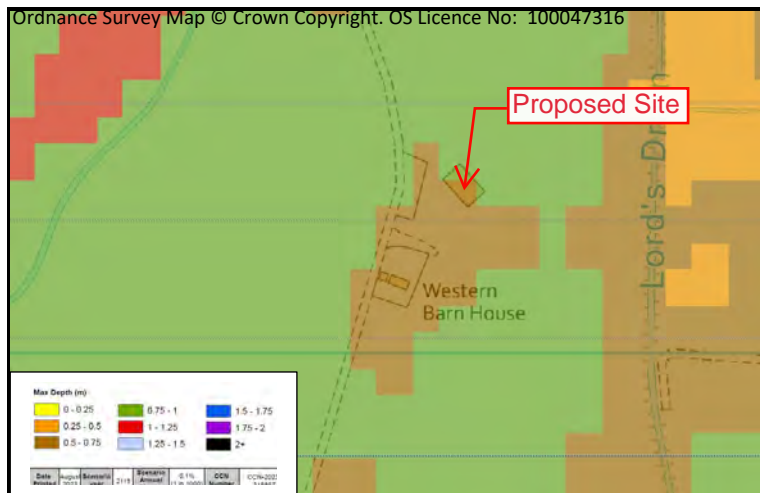
Where V = Flood flow velocity (m/sec)

D = Flood depth (m)

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

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

The Environment Agency has carried out Tidal Hazard Mapping for the east coast following a breach to the defences. Following a breach to the defences, the Lincolnshire & Northamptonshire Area Tidal Hazard Maps (2009), Scenario year 2006, for the 1 in 1000-year event. The maps show that the site is within in a Hazard rating less than 0.75 (Low hazard) with a maximum predicated depth of flow 0.25 – 0.5m and velocity of flow 0 – 0.3m/sec. With climate change up to year 2115 the maps show that for Scenario annual chance 1 in 1000 year, the site is within in a Hazard rating between 1.25 – 2.0 (Danger for Most) with a maximum predicated depth of flow 0.50 – 1.0m and velocity of flow 0 – 0.3m/sec. However, the fine detail 250mm band hazard depth map for the 1 in 1000-year event 2115, shows that the predicted depth of flow is 0.5 – 0.75m to the majority of the site.



250mm Depth Map 1 in 1000-year 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% scenario and with sleeping on the ground floor sleeping shall be determined by the flood depths arising from the 2115 0.1% 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 state that:

For depths of 0.50 – 0.75m FFL to be set 0.75m above the existing ground level, with flood resilient construction incorporated to a minimum height of 300mm above the predicted flood level. Therefore, the ground floor will be set at 0.75m above the existing ground level (3.85mODN) set at 4.60mODN.

South Holland District Council

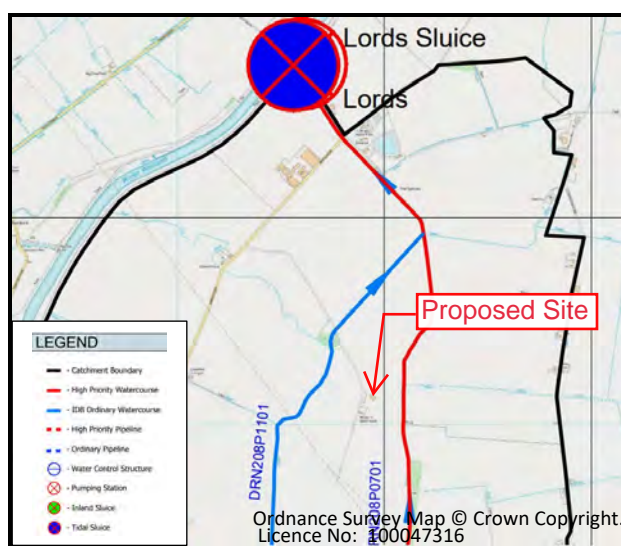
In order to inform the process of risk assessment and site selection the District Council commissioned Haskoning UK Ltd Consultants to prepare a Strategic Flood Risk Assessment in December 2002.They have carried out an update of this report and this report was published in January 2010, and this was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

This Flood Risk Assessment has taken the results from the data received from the Environment Agency.

South Holland Internal Drainage Board

The proposed development site is located within Lords (N) Catchment area of South Holland Internal Drainage Board. The Board is responsible to operate and maintain the arterial fluvial system.

The Board's nearest watercourse to the site is drain DRN208P0701 (R01Lords) some 50m east of the site. This watercourse discharges into the River Welland at Lords Sluice.



The Board's prior written consent will be required for any of the following works:

- No person without the previous consent of the Board shall erect any building or structure, whether temporary or permanent, or plant any tree, shrub, willow or other similar growth within 9 metres of the landward toe of the bank where there is an embankment or wall or within 9 metres of the top of the batter where there is no embankment or wall, or where the watercourse is enclosed within 9 metres of the enclosing structure.
- No person shall, without the previous consent of the Board, for any purpose, by means of any channel, siphon, pipeline or sluice or by any other means whatsoever, introduce any water into the district or, whether directly or indirectly, increase the flow or volume of water in any watercourse in the district.
- The erection or alteration of any mill dam, weir or other like obstruction to the flow, or erection or alteration of any culvert within the channel of a riparian watercourse.

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 proposed buildings is to be raised 300mm above the existing 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.
- 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 this 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.

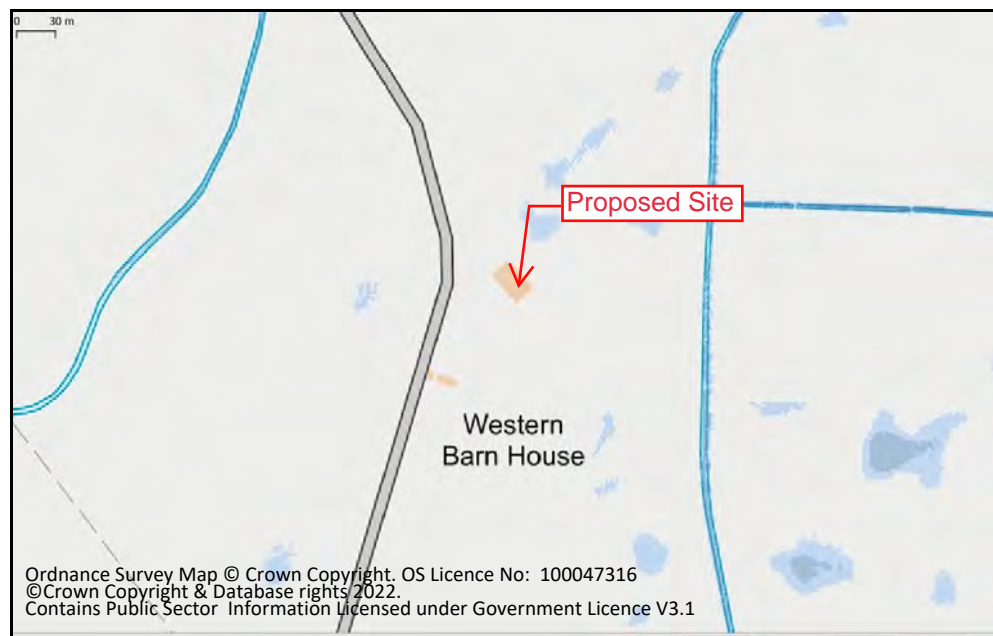
RESIDUAL RISKS

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

Part of the site is shown on the Low-Risk scenario Surface Water flood maps, for the 1 in 1000-year event, to be not affected from surface water flooding.



Risk of Flooding From Surface Water Map (Source EA)

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

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

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

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

SEQUENTIAL APPROACH

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

However, the results of the updated SHSFRA shows that the site is located within a low/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.

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 Test

NPPF Guidance Paragraphs 153 - 173 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.

Para168 of the NPPF states that applications for some minor development and changes of use should not be subject to the sequential or exception tests but should still meet the requirements for site-specific flood risk assessments.

CLMATE 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 20th of July 2021.

Peak River Flow Allowances

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.

The site is located within the Welland Management Catchment within the Anglian River Basin District, for sites within Flood Zone 2 or 3a and for “Less 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/ Welland	Upper End	22%	26%	53%
	Higher Central	10%	10%	28%
	Central	5%	4%	17%

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 1981to 2000 baseline)						
Area of England) (Use River Basin	Allowance	2000 to 2035	2036 to 2065	2066 to 2095	2096 to 2125	Cumulative Rise 2000 to 2125 (m)
Anglian	Higher Central	5.8 (203mm)	8.7 (261mm)	11.6 (348mm)	13 (390mm)	1.20m
Anglian	Upper End	7 (245mm)	11.3 (339mm)	15.8 (474mm)	18.1 (543mm)	1.6m

DRAINAGE STATEMENT

Surface Water Drainage

It is proposed that the surface water run-off from the roof of the development will utilise the existing outlets which have served the existing building for many years without causing any problems, these will be inspected cleaned

out and renewed if necessary. The surface water run-off from the site will be reduced by the removal of the existing lean to.

The proposed parking areas and access road will be constructed with permeable materials or they already exist..

Foul Water Drainage

Foul drainage from the development will be collected in underground pipes and to discharge to a package treatment plant in accordance with document H of the Building Regulations. This may require a permit from the EA

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

FLOOD PROTECTION

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

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

The proposed two buildings 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 0.75m above the existing ground level (3,75mODN) set at 4,60mODN. The entrance area will remain at the existing level to preserve the appearance of the external openings to the building. Provision will be made for the installation of 600mm high demountable flood barriers.
- 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.
- 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.
- 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 Owners 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 tidal flood defences which are well maintained by the Environment Agency.
- The proposed site for the proposed building is shown to be within Flood Zone 3 'High Probability' as detailed on the Environment Agency's Flood Zone Maps without defences.
- The floor level for the living accommodation will be raised 0.75m above the existing ground level set at 4.60mODN.
- The Flood Risk Vulnerability Classification in Table 2 of NPPG the proposed development is classified as "More Vulnerable" use. With the application being a change of use the sequential and exception tests are not required.
- 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 South Holland District 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%	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	Boygriff	555131	380860	3.72	3.74	3.77	4.06	4.11	4.22	4.33	4.43	4.65	4.43	4.57	4.87	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)

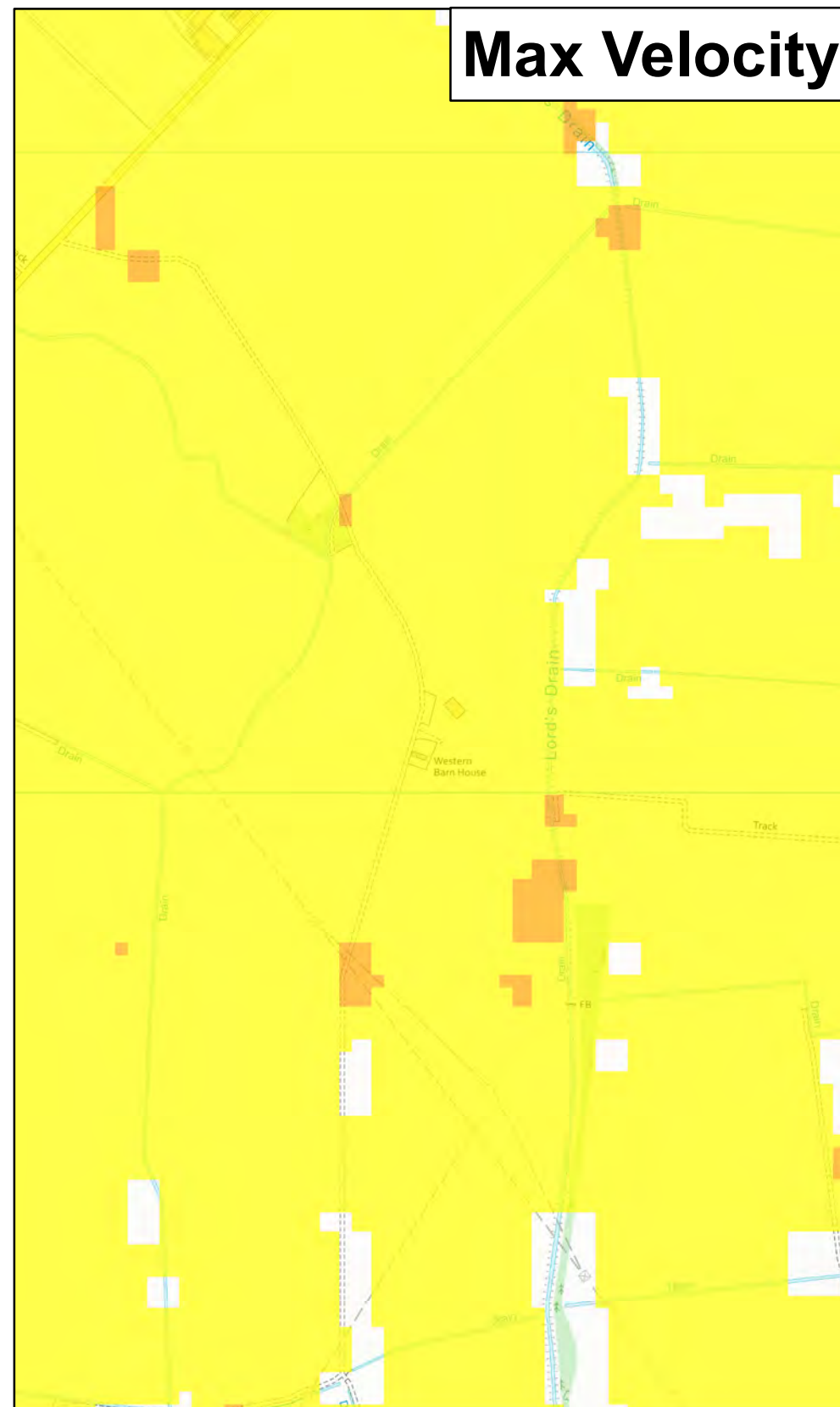
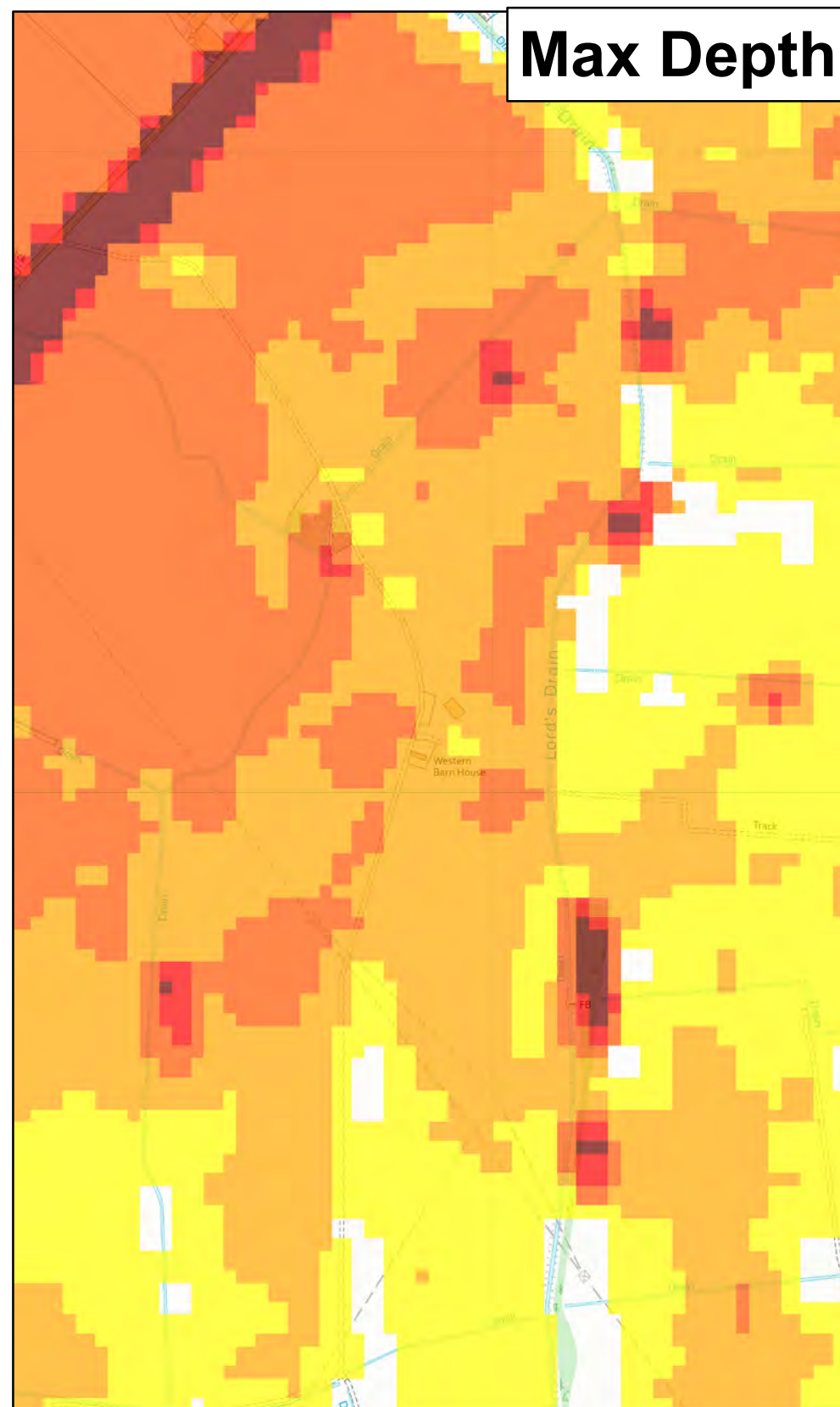
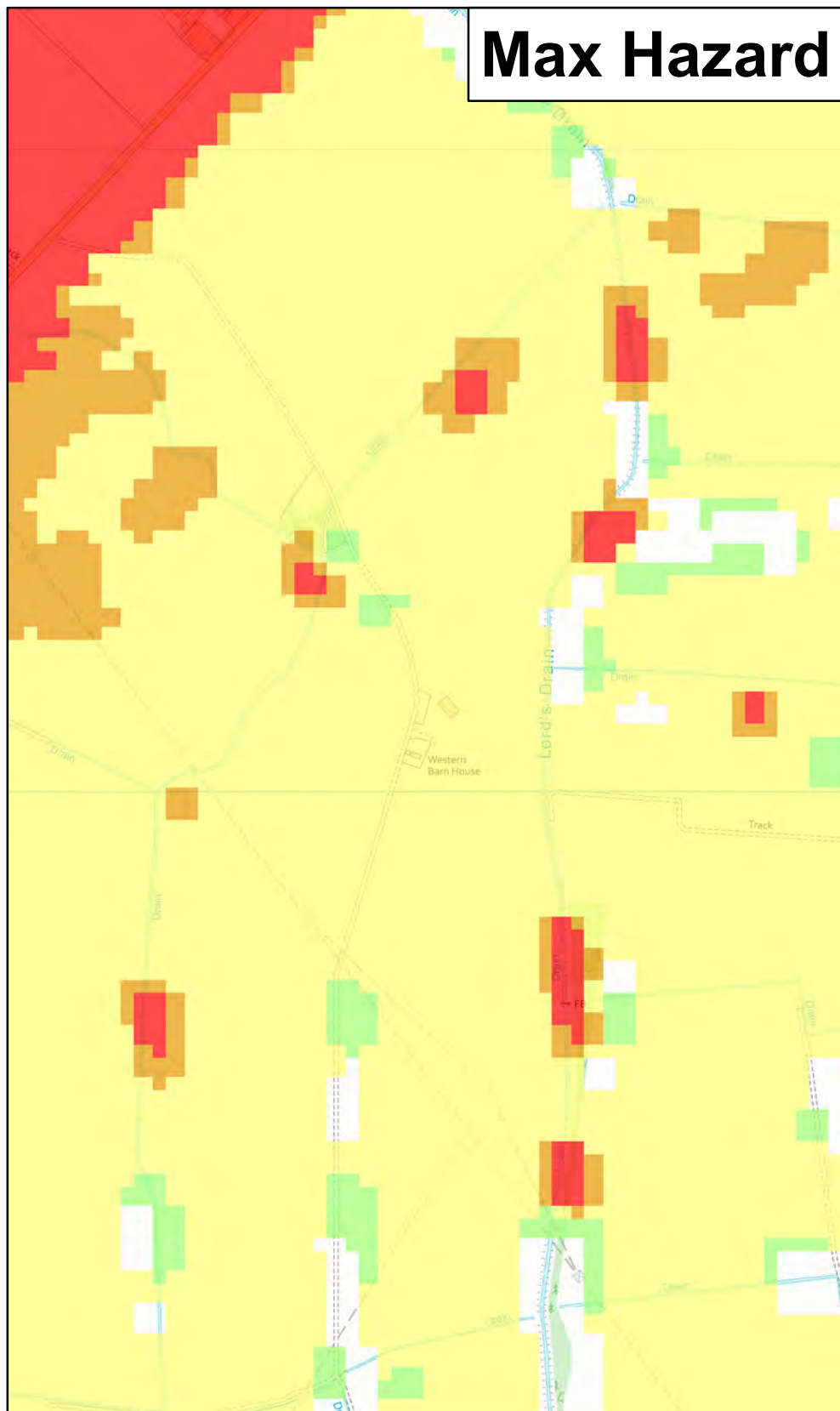
- The base date for the data is 2017.
- The levels are still water levels. Depending on the use of the data it may be necessary to consider wave heights and / or joint probability analysis of water level and other variables.
- Levels for other annual chance probabilities are available if required.
- 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

- Grand Sluice remains the tidal limit for the River Witham.
- The data is based on CFB 2018 data for Boston Barrier site, capped at 5.3mAOD to reflect use of the barrier which raises for tides above this level.
- 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>



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

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

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

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

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

Date Printed	August 2023	Scenario year	2006	Scenario Annual Chance	0.1% (1 in 1000)	CCN Number	CCN-2023-318867
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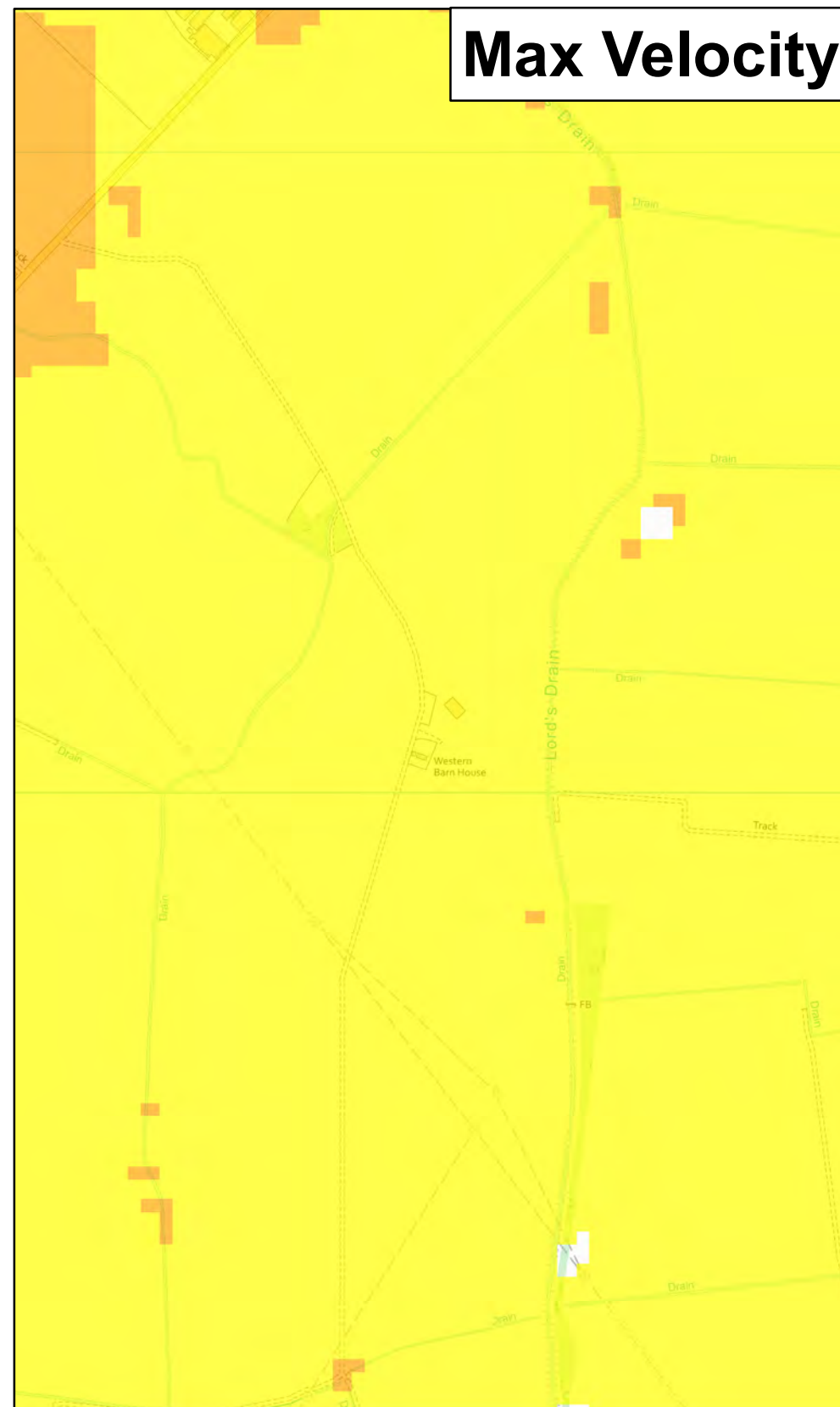
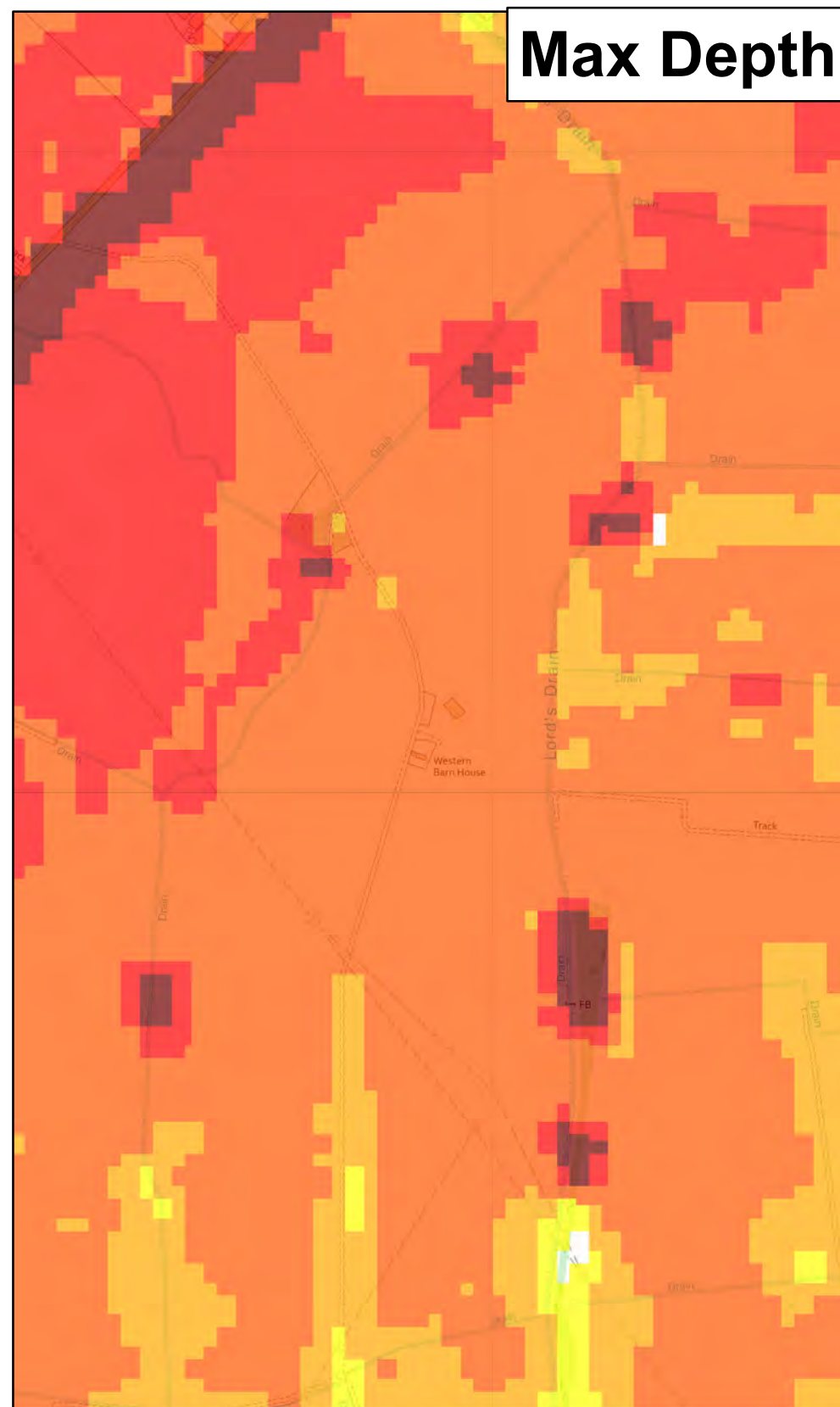
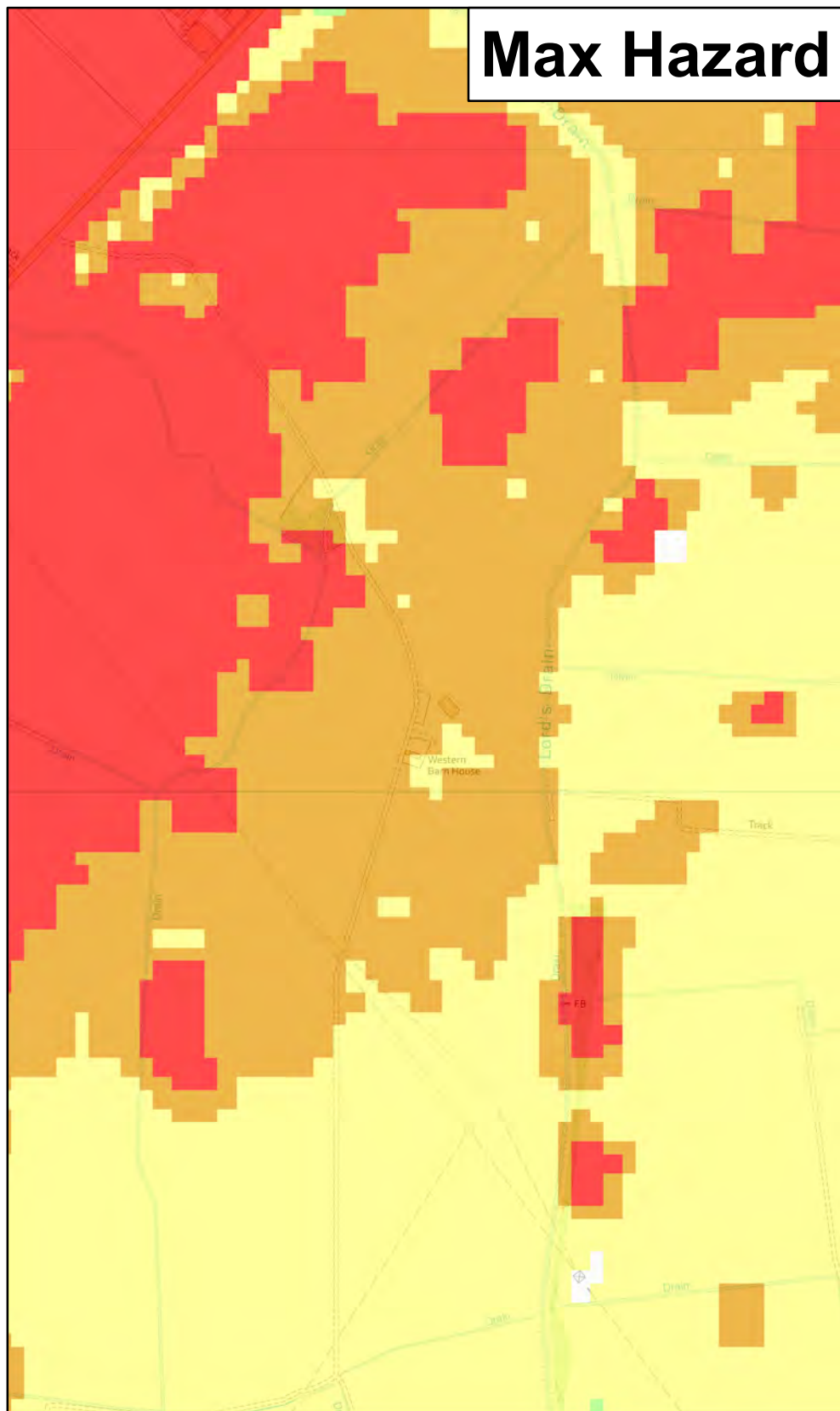
General Enquiries No: 03708 506 506. Weekday Daytime calls cost 5p plus up to 6p per minute from BT Weekend Unlimited. Mobile and other providers' charges may vary



Lincolnshire and Northamptonshire Tidal Breaching Hazard Mapping

Map Centred on TF 29905 29128

1:10,000
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★ **Modelled Breach Locations** - see also the accompanying plan "Location of Modelled Breaches"

Max Hazard (Flood Risk to People : FD2320)	Max Depth (m)	Max Velocity (m/s)
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Date Printed	August 2023	Scenario year	2115	Scenario Annual Chance	0.1% (1 in 1000)	CCN Number	CCN-2023-318867
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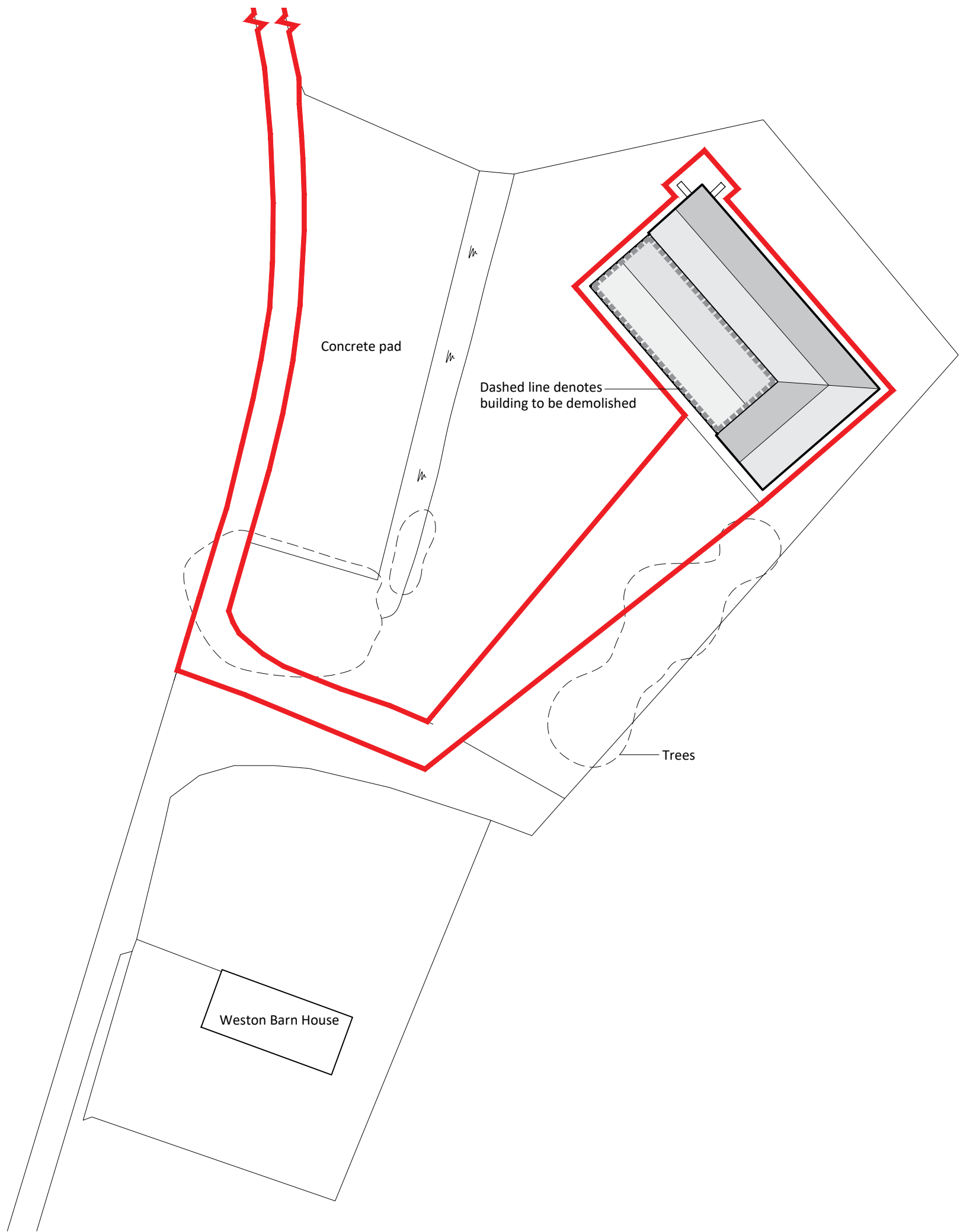
General Enquiries No: 03708 506 506. Weekday Daytime calls cost 5p plus up to 6p per minute from BT Weekend Unlimited. Mobile and other providers' charges may vary



Lincolnshire and Northamptonshire Tidal Breaching Hazard Mapping

Map Centred on TF 29905 29128

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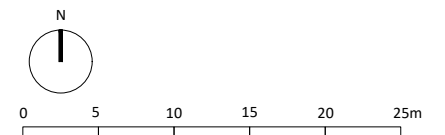
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Rev	Description	Date
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32 High Street, Helpringham
 Sleaford, Lincolnshire, NG34 0RA

Tel: 01529 421646
 Email: admin@rdc-landplan.co.uk
 Web: www.rdc-landplan.co.uk

Client
 George Hay & Sons Ltd

Project
 Barn to the north of Weston Barn House
 Marsh Road, Spalding Marsh

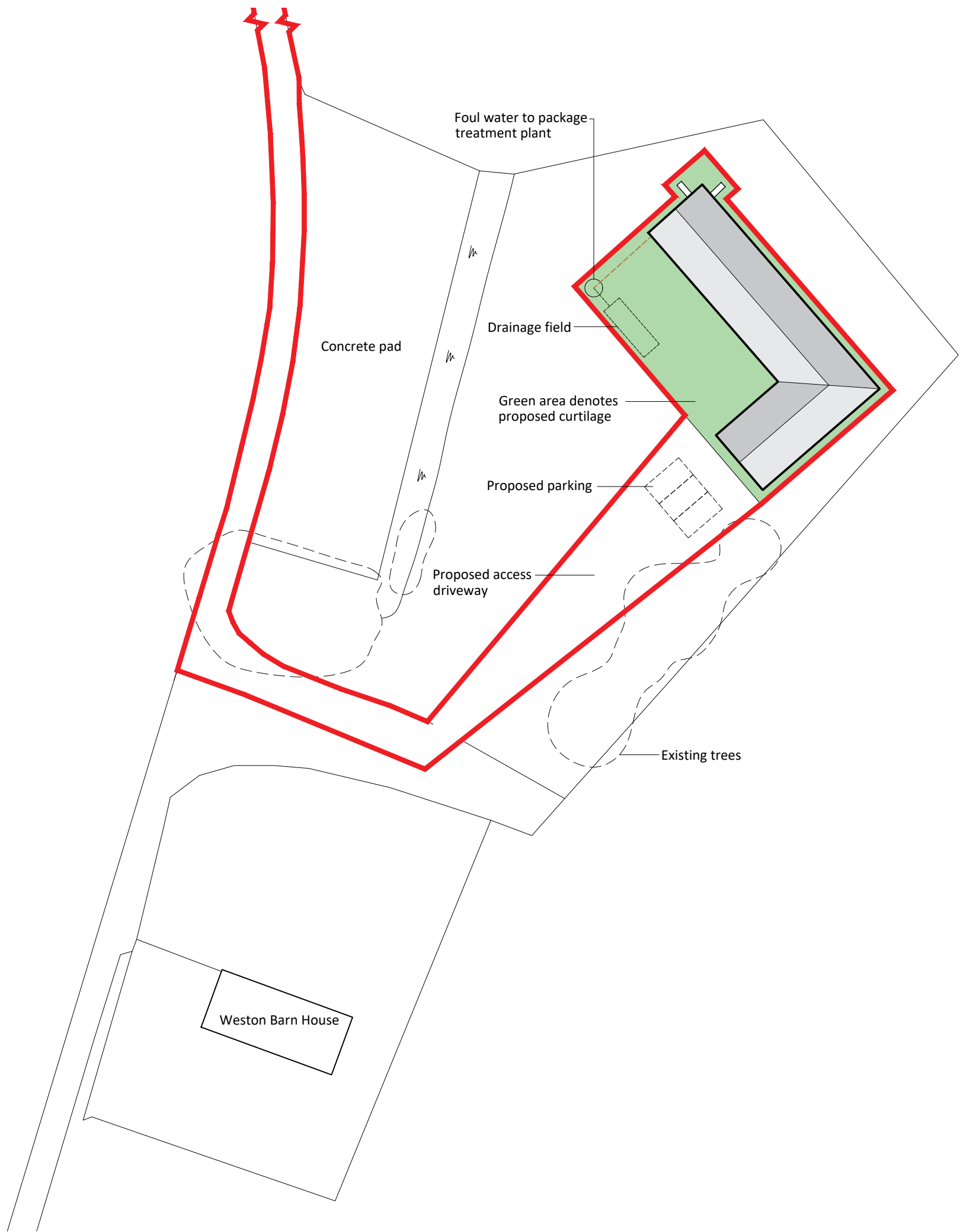
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 Existing Site Plan

Scale @ A3 1: 500	Date 19/09/23
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Drawn By WW	Checked By LMS
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Job Number 1154-2	Status PL	Purpose of Issue Planning
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Drawing No. 1154-2_PL_SP01	Rev -
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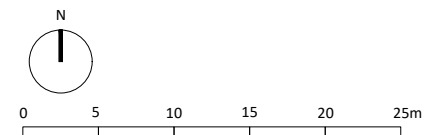
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Rev	Description	Date
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 Tel: 01529 421646
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Client
 George Hay & Sons Ltd

Project
 Barn to the north of Weston Barn House
 Marsh Road, Spalding Marsh

Drawing
 Proposed Site Plan

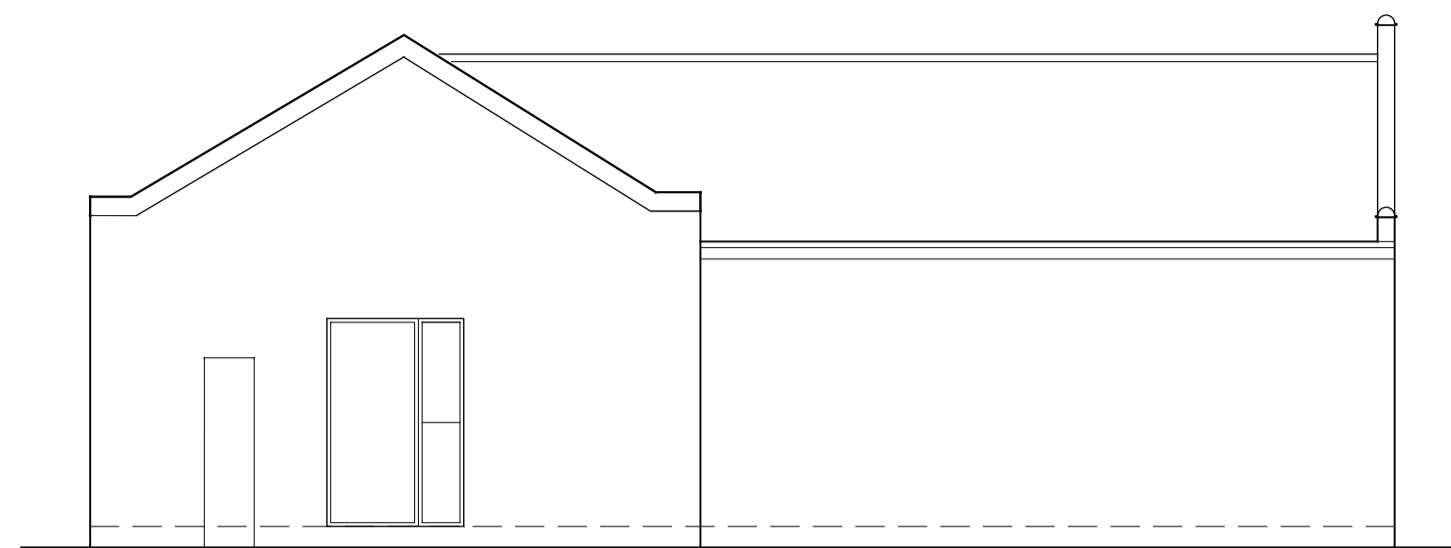
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Drawn By WW	Checked By LMS
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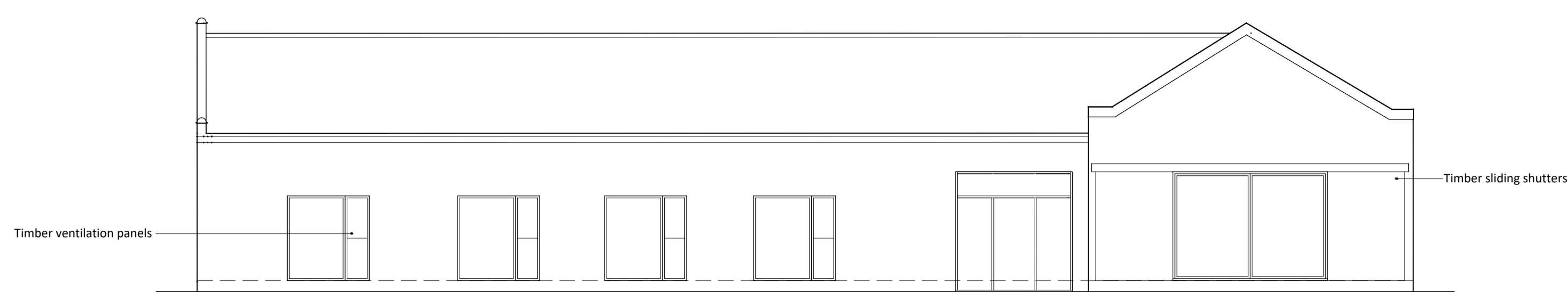
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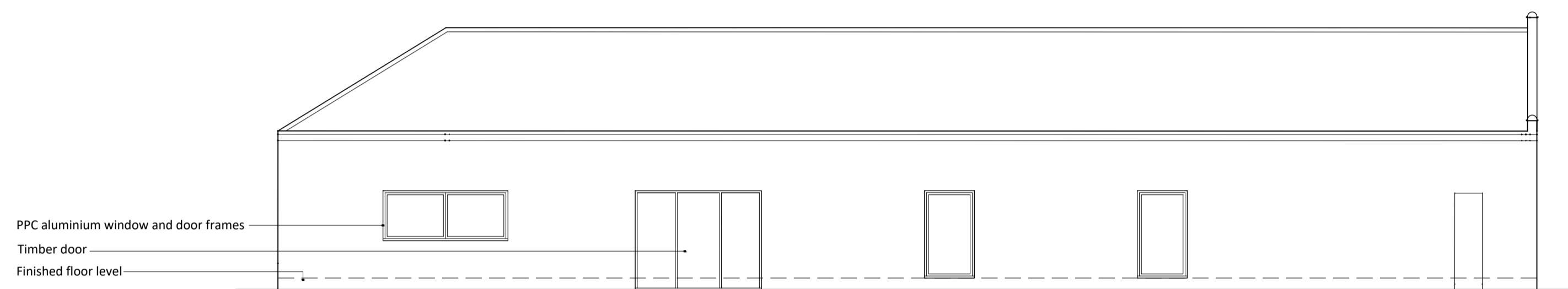
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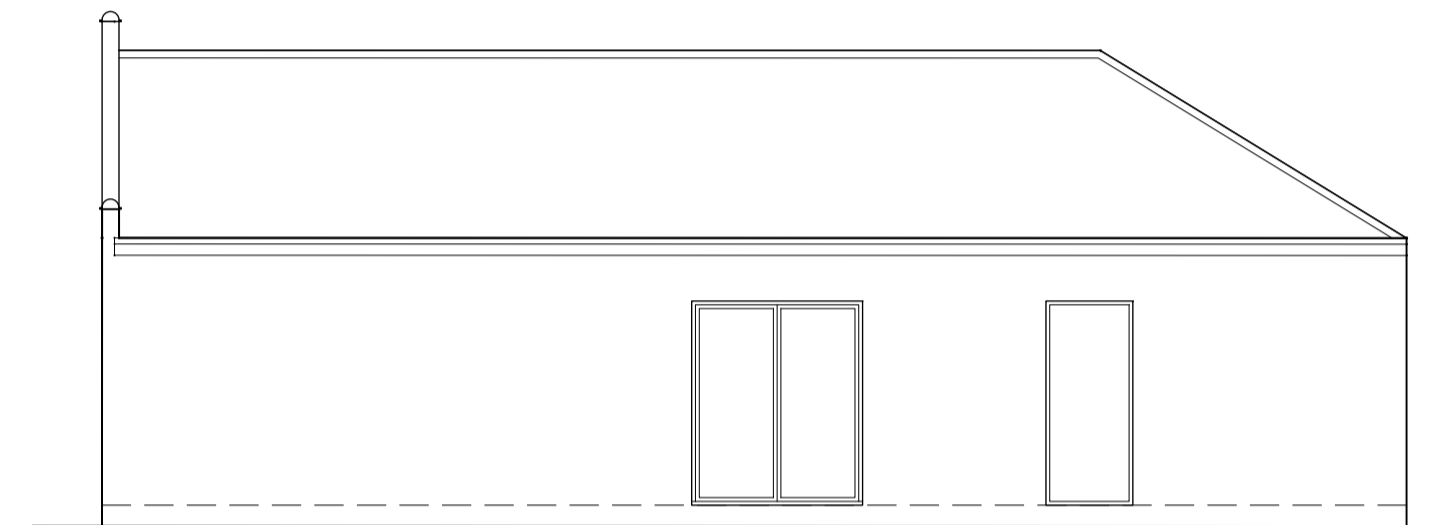
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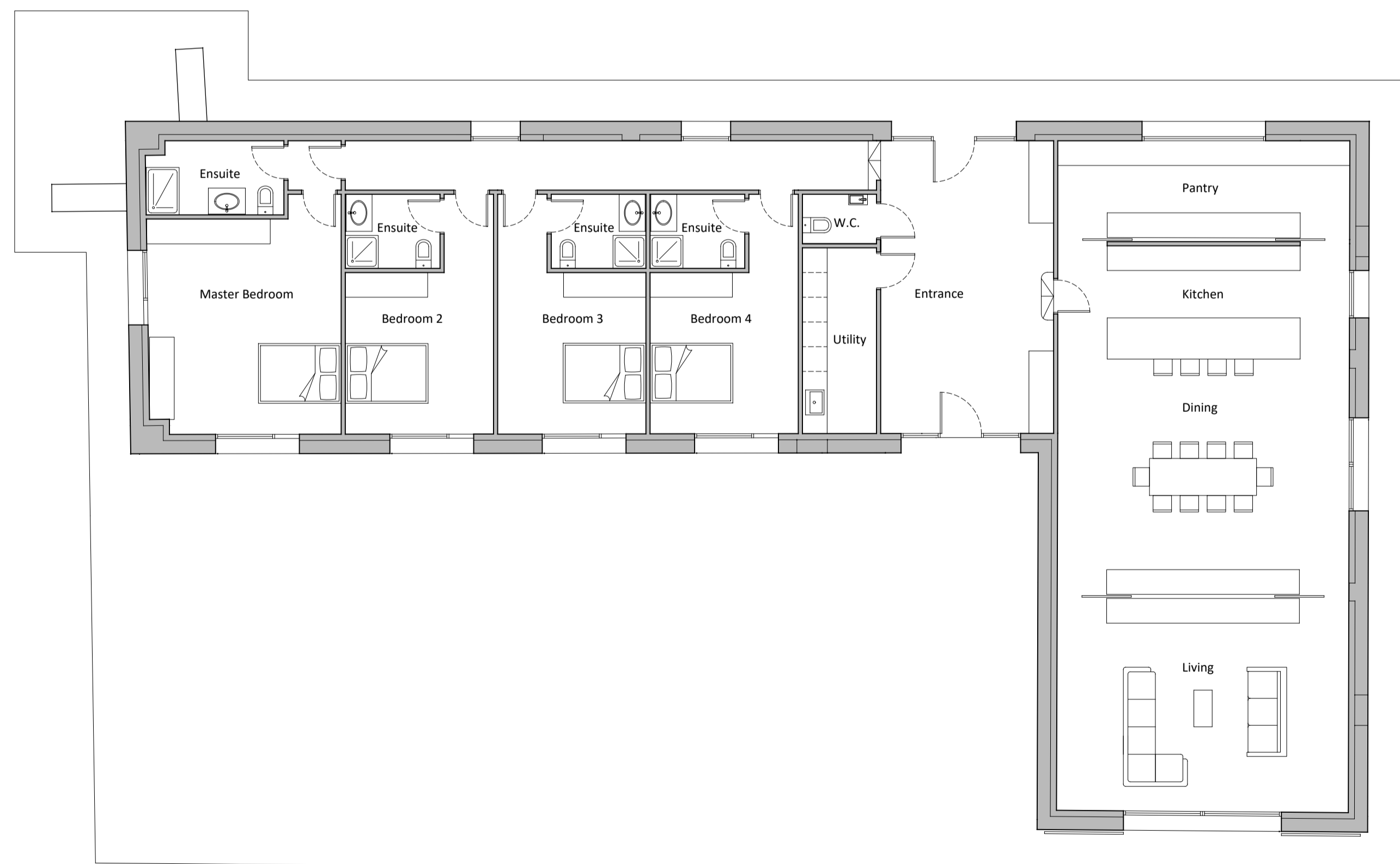
Southwest Elevation



Northeast Elevation



Southeast Elevation



Ground Floor Plan



Rev	Description	Date

rdc
 Robert Doughty
 Consultancy
 32 High Street, Helpringham
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 Web: www.rdc-landplan.co.uk

Client
 George Hay & Sons Limited

Project
 Weston Barn House
 Spalding Marsh

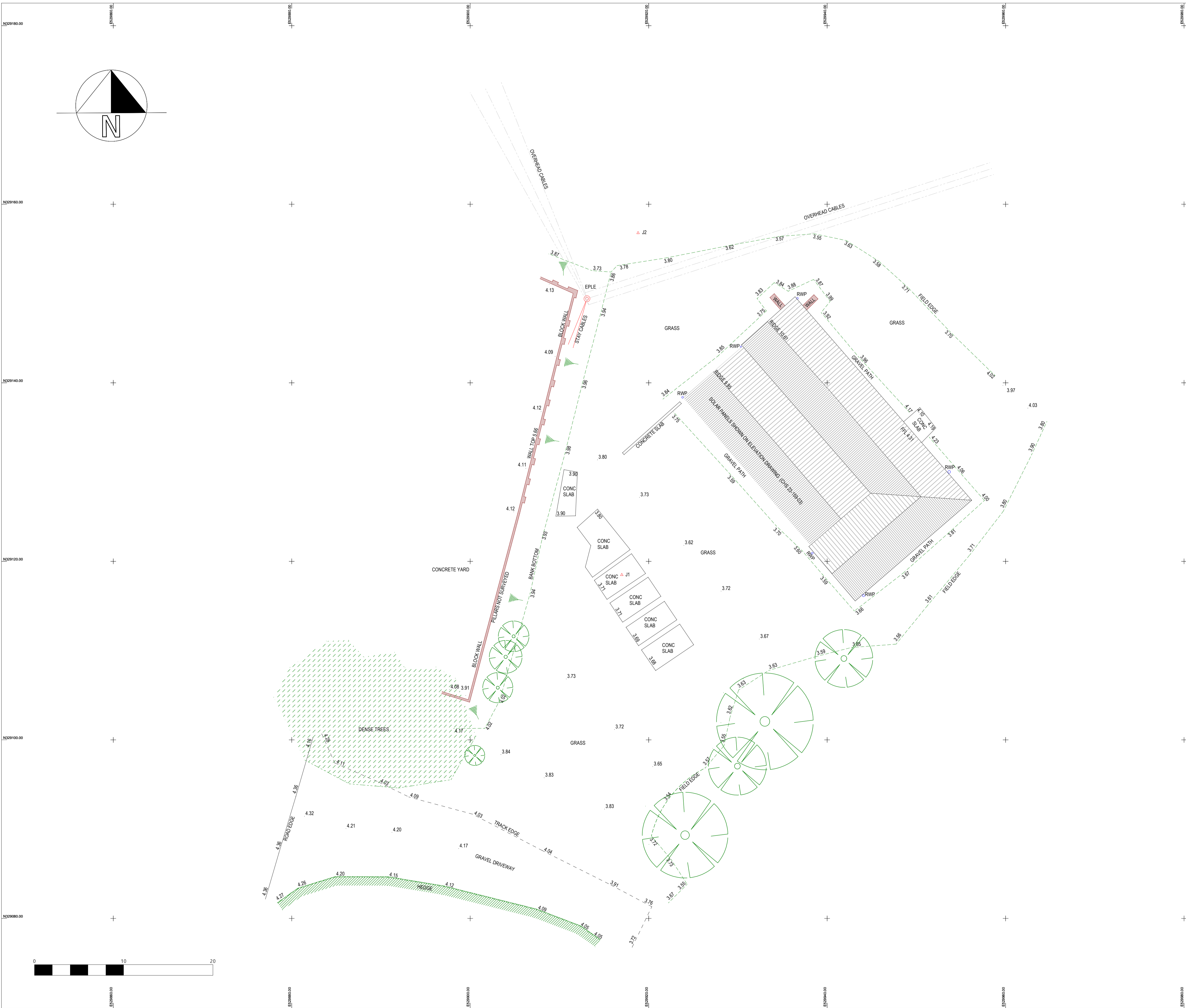
Drawing
 Proposed Plan & Elevations

Scale @ A1 1: 100 **Date** 22/09/23

Drawn By NG **Checked By** .

Job Number 1154-2 **Status** PL **Purpose of Issue** Planning

Drawing No. 1154-2_PL_GA02 **Rev** -



NOTES

ABBREVIATIONS & SYMBOLS

AV	AIR VALVE	OHC	OVERHEAD CABLE
BH	BORE HOLE	PB	POST BOX
BOL	ROLLARD	PNV	PIPE INVERT LEVEL
CATV	CABLE TV WH	PM	PARKING METER
CL	COVER LEVEL	PO	POST
CH	CHANNEL	PT	POST TOP LEVEL
COL	COLUMN	PR	POST & RAIL FENCE
DC	CABLE TV LID	PRW	POST & WIRE FENCE
DP	DOWN PIPE	RE	EDGE OF ROAD/NO KEBB
DR	DRAIN	RL	RIDGE LEVEL
EL	EAVES LEVEL	RP	REFLECTIVE POST
EP	ELECTRIC POLE	RS	ROAD SIGN
ER	EARTH ROD	SLS	STONE LEVEL
FB	FLOWER BED	SOFF	SOFFIT LEVEL
FI	FIRE HYDRANT	SV	VALVE
PFL	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	TLN	TELEGRAPH POLE
IC	INSPECTION COVER	TOW	TOP OF WALL LEVEL
IL	INVERT LEVEL	TP	TRAP
KB	KERB BOTTOM	TRK	TRACK
HO	HOSE ORLET	UTL	UNABLE TO LIFT
KT	KERB TOP	VP	VENT PIPE
LP	LAMP POST	WL	WATER LEVEL
LC	LIGHT COLLUM	WLWL	WATER LEVEL
NH	MANHOLE	WM	WATER METER
MP	MARKER POST	WO	WASH OUT POINT

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

2. ALL LEVELS RELATE TO HGTS TAKEN USING TRIMBLE VRS NOW

3. TREES SPREADS ARE DRAWN TO SCALE AND SHOW THE GENERAL/AVERAGE 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 OBSOBEATED 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 CASTLE HILL SURVEYS LTD.

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

Point	Easting	Northing	Elevation
J1	529916.994	329118.483	3.772
J2	529918.813	329156.778	3.815

SURVEY DATE	24-08-2023	INITIALS	JT
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REV	AMENDMENTS	DRN	DATE

Client:
ROBERT DOUGHTY CONSULTANCY

Project Title:
WESTON BARN
MARSH ROAD
SPALDING

Drawing Title:
TOPOGRAPHICAL SURVEY

Scale @ A1: 1:200 Date: 25/08/2023

Drawing No: CHS23-159-01 Rev:

C.A.D Title: rdc_weston_barn_marsh_road_spalding_topo_chs23-159-01.mjjo

Drawn By: JT Checked By: SRW

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Land Surveying & Site Setting Out Services
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E-mail: castlehillsurveys@outlook.com
Website: www.castlehillsurveys.co.uk