FLOOD RISK ASSESSMENT
FOR COMMERCIAL DEVELOPMENT AT
HURDLETREE BANK, WHAPOLODE ST CATHERINE

FINAL REPORT

ECL0968/SWANN EDWARDS ARCHITECTURE

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1.0 INTRODUCTION

This Flood Risk Assessment has been prepared in accordance with National Planning Policy Framework (NPPF) and supporting planning practice guidance (PPG) on Flood Risk and Coastal Change.

In areas at risk of flooding or for sites of 1 hectare or more, developers are required to undertake a site-specific Flood Risk Assessment to accompany an application for planning permission. This Flood Risk Assessment has been produced on behalf of S&R Properties in respect of a development that consists of a physio and grooming room at Green Peace Boarding Kennels.

A planning application for the proposed development is to be submitted by Swann Edwards Architecture.

2.0 SITE LOCATION AND DESCRIPTION

2.1 Site Location

The site is located at Green Peace Boarding Kennels, Hurdletree Bank, Whaplode St Catherine, Spalding, PE12 6SA. The National Grid Reference of the site is 53388/32162.

The location of the site is shown in Figure 1.



Figure 1 – Location Plan (© OpenStreetMap contributors)

2.2 Existing Site

The site is on the northern side of Hurdletree Bank. The site consists of a dog boarding kennels and the surrounding land. The site has access to Hurdletree Bank alongside a dwelling that is to the south of the kennels. The site area is approximately 0.45 hectares.

Environment Agency LiDAR data shows that ground levels within the site range between +2.6m OD and +2.9m OD. The lowest ground levels are close to the northern boundary of the site and in the area of the proposed building ground levels are typically +2.8m OD.

The site is in the South Holland Internal Drainage Board (IDB) District. Surface water at the site would naturally drain through soakaway and hence to the IDB drain system. There are riparian drains on the eastern and western boundaries of the site and an IDB High Priority Watercourse 80m west of the site.

The online British Geological Survey maps indicate that the site is likely to be underlain by West Walton Formation Mudstone and Siltstone. The bedrock is shown to be overlain with superficial deposits of clay and silt.

2.3 Proposed Development

The proposed development consists of a building to be used for dog physio and grooming. The building will be single storey. Details of the proposed development are provided in Attachment 1.

2.4 Local Development Documents

The South East Lincolnshire Local Plan 2011 – 2036, adopted in March 2019, is the Local Plan for the district. Policy 4: Approach to Flood Risk states the requirements for flood risk reduction.

The South East Lincolnshire Level 1 and Level 2 Strategic Flood Risk Assessment (SFRA) was prepared in June 2017.

The Joint Lincolnshire Flood Risk and Drainage Management Strategy has been prepared by Lincolnshire County Council as the Lead Local Flood Authority. The purpose of the Strategy is to increase the safety of people across Lincolnshire by reducing the number of people at risk of flooding, increasing the resilience of local communities, and reducing the impact of flooding.

2.5 Flood Zones

An extract from the Environment Agency Flood Map for Planning is shown in Figure 2. The site is located within Flood Zone 3, an area with a high probability of flooding.

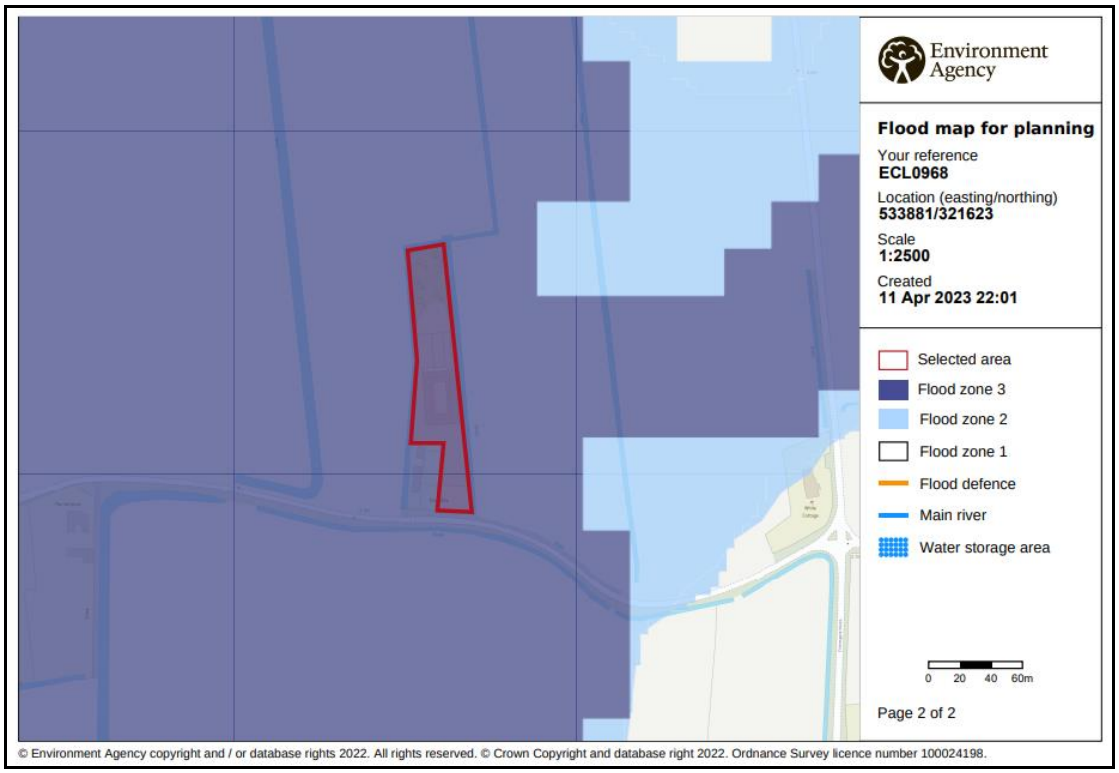


Figure 2 – Environment Agency Flood Map for Planning

The Environment Agency Long Term Flood Risk maps show that:

- the site has a low risk of flooding from rivers or the sea (annual probability between 0.1% and 1%);
- the site has a very low risk of surface water flooding (annual probability of less than 0.1%); and
- the site is not within an area at risk of reservoir flooding.

Table 1 shows the level of risk at the site within the South East Lincolnshire SFRA.

SFRA Map	Present Day	2116
Residual Flood Hazard Map for the 1% fluvial and 0.5% tidal event	The site is outside the 'Low Hazard' area	The site is outside the 'Low Hazard' area
Residual Peak Depth Map for the 1% fluvial and 0.5% tidal	The site is outside the area at risk	The site is outside the area at risk

Table 1 – Flood Risk within SFRA Maps

3.0 FLOOD RISK VULNERABILITY

3.1 The Sequential and Exception Test

The NPPF requires the application of a Sequential Test to ensure that new development is in areas with the lowest probability of flooding.

The Exception Test is a method to demonstrate and help ensure that flood risk to people and property will be managed, while allowing necessary development to go ahead in situations where suitable sites at lower risk of flooding are not available.

3.2 Vulnerability Classification

Table 2 of the PPG Flood Risk and Coastal Change categorises different types of uses and development according to their vulnerability to flood risk. The proposed development is covered by the description of buildings used for services and is classified as 'Less Vulnerable'.

Table 3 of the PPG Flood Risk and Coastal Change sets out Flood Risk Vulnerability and flood zone 'compatibility'. The site is in Flood Zone 3 and the development is 'Less Vulnerable' therefore it is not necessary to complete the Exception Test.

PPG Flood Risk and Coastal Change defines that the lifetime of the development in terms of flood risk and coastal change is 100 years.

3.3 Application of the Sequential Test

It is for the Local Planning Authority, using the evidence provided and taking advice from the Environment Agency as appropriate, to consider whether an application passes the Sequential Test.

Large parts of the South Holland lie within Flood Zone 3. As such there are limited opportunities to undertake the development at an alternative site with a lower flood risk. The proposed development will form part of an existing commercial development and therefore it is not practical to undertake the development elsewhere.

The SFRA states that it is necessary to use refined flood risk information (hazard and depth maps) to assist with the application of the sequential test. The refined flood risk information contained within the SFRA demonstrates the site is not at risk during the 1% fluvial event and 0.5% tidal event including climate change. The site is considered to pass the Sequential Test.

4.0 SITE SPECIFIC FLOOD RISK

4.1 Local Flood Assets

The development site is within Whaplode Fen which is protected by the River Welland tidal defences between Spalding and Fossdyke. The defences are 8.3 km north west of the site and minimum embankment levels of +7.0m OD.

There is a long-term strategy for the maintenance of the Environment Agency defences which is reviewed and updated periodically.

There is an extensive local drainage network managed by South Holland IDB. There is an IDB High Priority Watercourse 80m west of the site. The site and surrounding land are within the Little Holland catchment and drains to the Little South Holland Drain which discharges to the South Holland Main Drain at the Little Holland Pumping Station. The South Holland Main Drain discharges to the tidal River Nene at the Sutton Bridge Tidal Sluice.

During the operation and maintenance of its pumping stations, associated structures, and channel systems, the IDB seeks to maintain a general standard capable of providing flood protection to its district. A routine maintenance programme is in place to ensure that the Boards assets are commensurate with the standard of protection that is sought.

Current maintenance standards of the South Holland Internal Drainage Board and the Environment Agency are generally good.

4.2 Sources of Flooding

A summary of the sources of flooding is provided in Table 2.

Source of Flooding	Level of Risk
Drainage Network Flooding	The risk is assessed in Section 4.3.
Surface Water Flooding	Based upon the EA maps the risk is very low.
Fluvial Flooding	The site is not at risk of fluvial flooding.
Tidal Flooding	The risk is assessed in Section 4.3.
Reservoir Flooding	Based upon the EA Maps the site is not at risk of reservoir flooding.
Groundwater Flooding	Due to the underlying geology the risk is considered to be low.

Table 2 – Sources of Flooding

4.3 Probability of Flooding

The probability of flooding associated with blockages in the South Holland IDB drainage system is low due to the maintenance standards achieved and managed by the IDB. Failure of Little Holland Pumping Station would increase the level of risk in the catchment.

Through the operation and maintenance of the pumping stations and the channel system the Board seek to maintain a general standard capable to providing flood protection to agricultural land and developed areas of 1 in 20 years and 1 in 100 years, respectively. The risk associated with flood events that exceed the standard of protection provided is lowered due to the South Holland IDB main drains incorporating freeboard. This freeboard provides storage during the exceedance events.

The site is within an area benefitting from defences. The River Welland tidal defences provide protection during a 0.5% annual probability (1 in 200 chance each year) event.

4.4 Historic Flooding

During the preparation of this assessment, no evidence was discovered of the site being flooded.

4.5 Climate Change

Climate change is likely to impact the site through increased rainfall intensity and duration affecting the local drainage network and increased tide levels.

The flood level in the River Welland at Fossdyke during the 0.5% annual probability (1 in 200 chance each year) event inclusive of climate change to 2069 is estimated to be 6.41m AOD. The minimum defence level of the River Welland embankments is 7.0m AOD.

In summary the site is not at risk for the design life of the development (i.e., 100 years).

4.6 Residual Risk

The South East Lincolnshire SFRA includes maps demonstrating the impact of climate change in 2116. The Residual Peak Depth maps within the SFRA indicate the maximum flood depths associated with a breach of the tidal defences. These show that when the climate change allowances are applied to the combination of a 1% annual probability (1 in 100 chance each year) fluvial event and a 0.5% annual probability (1 in 200 chance each year) tidal event the site is not at risk.

5.0 FLOOD RISK MITIGATION

5.1 Summary of Risks

The probability of this development flooding from localised drainage systems is low. Failure of Little Holland Pumping Station could lead to an increased level of risk at the site.

The probability of the site flooding from any Environment Agency system is less than 0.5% annual probability (1 in 200 chance each year) because of the standards of the existing flood defences. Over time there will be a gradual increase in risk to the site due to climate change. During the design life of the development, it is not anticipated that the site would flood from overtopping of the defences.

The SFRA considers the residual risk associated with a breach in the defences in 2116. The maps show that the site is not at risk.

The proposed arrangement has the potential to increase the volume of surface water runoff from the site and therefore has the potential to increase flood risk.

5.2 Mitigation Measures

The site has a low 'actual risk' of flooding. Based upon the information available during the preparation of this flood risk assessment it is recommended that finished floor level is 0.3m above surrounding ground level.

The developer should ensure that the user of the building is sufficiently aware of the risk of flooding, and the standard of the existing defences. The Environment Agency operates a flood warning system for properties at risk of flooding to enable householders to protect life or take actions to manage the effect of flooding on property. Floodline Warnings Service is a national system run by the Environment Agency for broadcasting flooding warnings. The user of the building should register to receive flood warnings.

Should there be a failure of Little Holland Pumping Station and conditions were such to put properties and land at risk of flooding, the Internal Drainage Board would take emergency action to maintain the drainage level of service by using temporary pumping equipment.

It is recommended that surface water run-off is managed so that stormwater from the site will not affect any adjoining properties or increase the flood risk elsewhere.

6.0 CONCLUSIONS

As a result of the assessment, the following conclusions have been reached.

- The proposed development consists of a building to be used for dog physio and grooming at Green Peace Boarding Kennels, Hurdletree Bank, Whaplode St Catherine.

- The site is located within an Internal Drainage Board catchment and through the operation and maintenance of the pumping stations and the channel system the Board seek to maintain a general standard capable to providing flood protection to agricultural land and developed areas of 1 in 20 and 1 in 100 years, respectively.

- Part of the proposed development is in Flood Zone 3. The development is protected by defences during the 1% annual probability (1 in 100 chance each year) fluvial event and 0.5% annual probability (1 in 200 chance each year) tidal event including an allowance for climate change. The site is not at risk during a breach of the tidal defences.

- It is recommended that the finished floor level is 0.3m above surrounding ground levels and that the user of the building receives flood warnings.

- The development passes the Sequential Test and is therefore suitable for the proposed location.

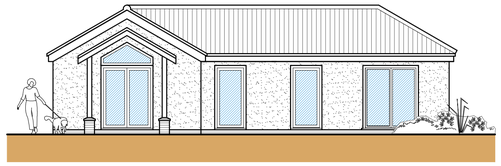
ATTACHMENT 1

PLANNING DRAWING
(Dwg SE-1914 PP1000)



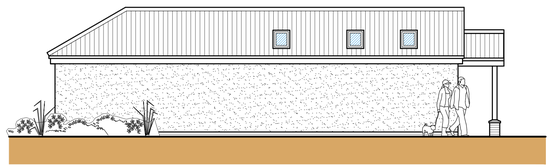
Site Plan
Scale: 1:200

0 2 4 6 8
metres



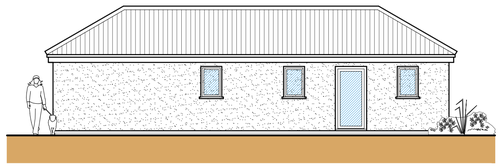
Front Elevation (E)
Scale: 1:100

0 1 2 3 4
metres



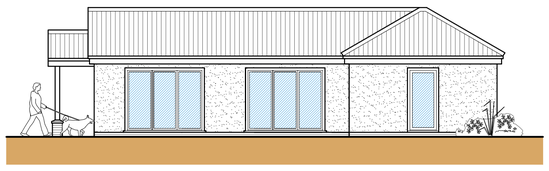
Side Elevation (S)
Scale: 1:100

0 1 2 3 4
metres



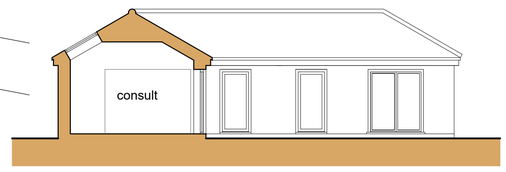
Rear Elevation (W)
Scale: 1:100

0 1 2 3 4
metres



Side Elevation (N)
Scale: 1:100

0 1 2 3 4
metres



Section A-A
Scale: 1:100

0 1 2 3 4
metres

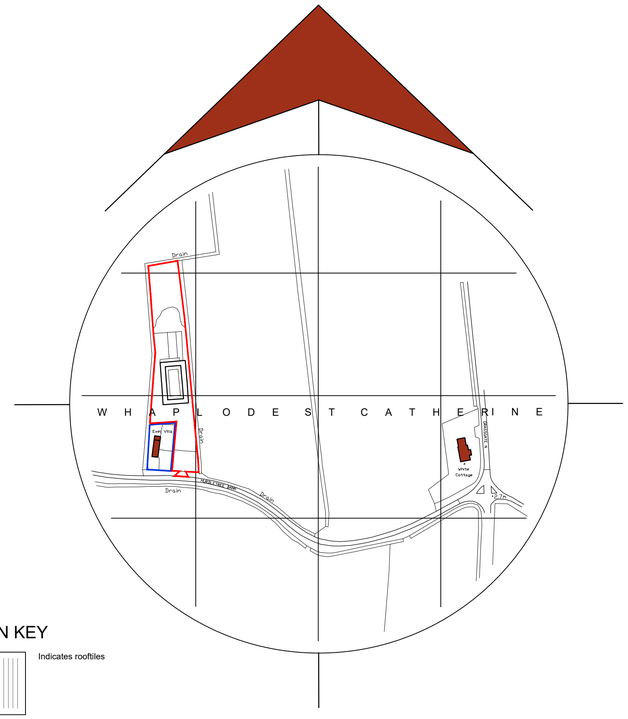
ELEVATION KEY

Indicates rooftiles

Indicates render

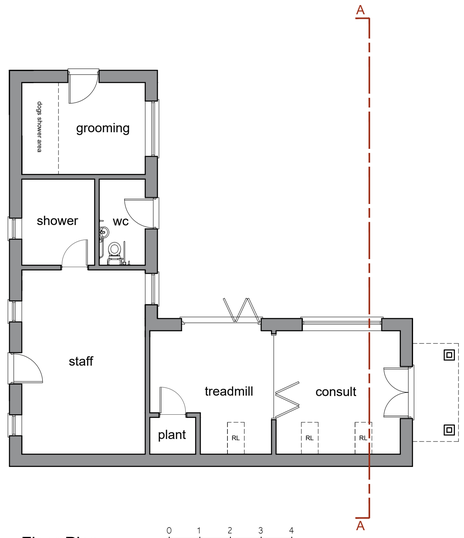
Indicates brickwork

Indicates joinery



Location Plan
Scale: 1:2500

0 25 50 75 100
metres



Floor Plan
Scale: 1:100

0 1 2 3 4
metres

General Notes

1. All dimensions are shown in 'mm' unless otherwise stated.
2. The contractor, sub-contractors and suppliers must verify all dimensions on site prior to the commencement of any work.
3. This drawing is to be read in conjunction with all relevant engineers and specialist sub-contractors drawings and specifications.
4. Any discrepancies are to be brought to the designers attention.

CONSTRUCTION DESIGN & MANAGEMENT REGULATIONS 2015

The following information must be read in conjunction with the project Risk register. This drawing highlights significant design related Health & Safety Risks present during Construction phase, and Residual Risks which remain post completion. Other Health & Safety Risks associated with Construction Activities may be present, and must be identified by the Principal Contractor prior to works commencing. Design Risks relating to specialist design items must be identified by the relevant specialist designers/ consultants and issued to the Principal Designer.

SITE PLAN KEY

Indicates site access

Indicates surveyed buildings on site

Indicates surveyed trees and hedging

Indicates change in level

Indicates features to be demolished

Indicates proposed buildings

Indicates unsurveyed buildings

Status

FOR APPROVAL

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Job Title
Proposed Physio and Grooming Room, Green Peace Boarding Kennels, Whaplode St Catherine PE12 6SA

Drawing Title
Planning Drawing

For: S&R Properties

Date: March 2023	Drawn by: BR
	Checked by: MC
Job No.: SE-1914	Sheet Size: A1
Dwg No.: PP1000	Revision:

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