

**FLOOD RISK ASSESSMENT  
FOR RESIDENTIAL DEVELOPMENT AT  
GREEN LANE, HOLBEACH ST JOHNS**

**FINAL REPORT**

**ECL1160a/SWANN EDWARDS ARCHITECTURE**

**DATE FEBRUARY 2024**

**ELLINGHAM CONSULTING LTD**

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## CONTENTS

### 1.0 INTRODUCTION

### 2.0 SITE LOCATION AND DESCRIPTION

- 2.1 Site Location
- 2.2 Existing Site
- 2.3 Proposed Development
- 2.4 Local Development Documents
- 2.5 Available Flood Risk Information

### 3.0 FLOOD RISK VULNERABILITY

- 3.1 The Sequential and Exception Test
- 3.2 Vulnerability Classification
- 3.3 Application of the Sequential and Exception Test

### 4.0 SITE SPECIFIC FLOOD RISK

- 4.1 Local Flood Assets
- 4.2 Sources of Flooding
- 4.3 Probability of Flooding
- 4.4 Historic Flooding
- 4.5 Climate Change
- 4.6 Residual Risks

### 5.0 FLOOD RISK MITIGATION

- 5.1 Summary of Risks
- 5.2 Mitigation Measures

### 6.0 CONCLUSIONS

ATTACHMENT 1 – Survey Drawing (Dwg SE-2029 100)

– Planning Drawing (Dwg SE-2029 PP1000 A)

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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 Mrs K Doubleday-Collishaw in respect of a development that consists of one residential dwelling at Green Lane, Holbeach St Johns.

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 Lane, Holbeach St Johns, Spalding, PE12 8SQ. The National Grid Reference of the site is 53697/31877.

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 north western side of Green Lane. The site consists of an area of agricultural land. The site is surrounded by agricultural land. The area of development is approximately 0.3 hectares.

Environment Agency LiDAR Data shows that the site is flat with ground levels between +2.0m OD and +2.3m OD. The carriageway level of Green Lane alongside the site is +2.3m OD. Spot levels taken to a site datum are shown in Attachment 1, these confirm that the site is up to 0.3m below the carriageway level of Green Lane.

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 is an IDB Ordinary Watercourse on the field boundary approximately 100m north 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 one residential dwelling. The dwelling will have two storeys. A Site Plan of the proposed development is 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.

| <b>SFRA Map</b>                                                   | <b>Present Day</b>                        | <b>2116</b>                               |
|-------------------------------------------------------------------|-------------------------------------------|-------------------------------------------|
| 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 dwellings and is classified as 'More Vulnerable'.

Table 3 of the PPG Flood Risk and Coastal Change sets out Flood Risk Vulnerability and flood zone 'compatibility'. The site is within Flood Zone 3 and the development is 'More Vulnerable' therefore it is 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 and Exception 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 district close lie within Flood Zone 3. As such, opportunities to undertake the development at an alternative site with a lower flood risk are limited. In this context it is noted that SE Lincolnshire Local Plan residential allocations are within flood risk areas due to the lack of availability of sites within areas of lower flood risk.

The SFRA states that as it is necessary to use the 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 or 0.5% tidal event. The site therefore has a low probability of flooding and is considered to pass the Sequential Test.

The Exception Test requires consideration of the wider sustainability benefits of a development and that the development would be safe and residual risks managed.

The Local Plan has a target of a net increase of at least 11,681 dwellings in South Holland over the 25-year local plan period. The Plan considers this new housing is

required to ensure the sustainability of the Local Plan area. The proposed development will contribute to this target.

Section 5 of this Flood Risk Assessment describes the flood mitigation measures and the management of the residual risks, demonstrating that this development will be safe and not increase flood risk elsewhere. The development is considered to pass the Exception Test.

## 4.0 SITE SPECIFIC FLOOD RISK

### 4.1 Local Flood Assets

The site is 9.7km west of the tidal River Nene. The site is protected by the River Nene tidal defences between Wisbech and Sutton Bridge. The River Nene is the responsibility of the Environment Agency.

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 Ordinary Watercourse on the field boundary approximately 100m north 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 risk is assessed in Section 4.3 and 4.5.                                 |
| Tidal Flooding            | The risk is assessed in Section 4.3 and 4.5.                                 |
| Reservoir Flooding        | Based upon the EA maps the site is not at risk of flooding from reservoirs.  |
| Groundwater Flooding      | There is no evidence to suggest the site is at risk of groundwater flooding. |

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 lead to an increased 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 North Level IDB main drains incorporating freeboard. This freeboard provides storage during the exceedance events.

The site benefits from defences on the River Nene that provide protection during a 0.5% annual probability (1 in 200 chance each year) tidal event and a 1% annual probability (1 in 100 chance each year) fluvial 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 flood levels in the River Nene.

The River Nene tidal defences have been designed to include an allowance for climate change.

In summary the existing systems and defences are appropriate for the design life of the development (i.e., 100 years).

### 4.6 Residual Risk

There is a residual risk of flooding in the vicinity of the site should a breach of the tidal defences occur. The South East Lincolnshire SFRA includes maps demonstrating the residual peak depth in 2116. An extract from this map is shown in Figure 3 below. When climate change allowances are applied to the 1% annual probability (1 in 100 chance each year) fluvial event and 0.5% annual probability (1 in 100 chance each year) tidal event the site is not at risk during a breach.

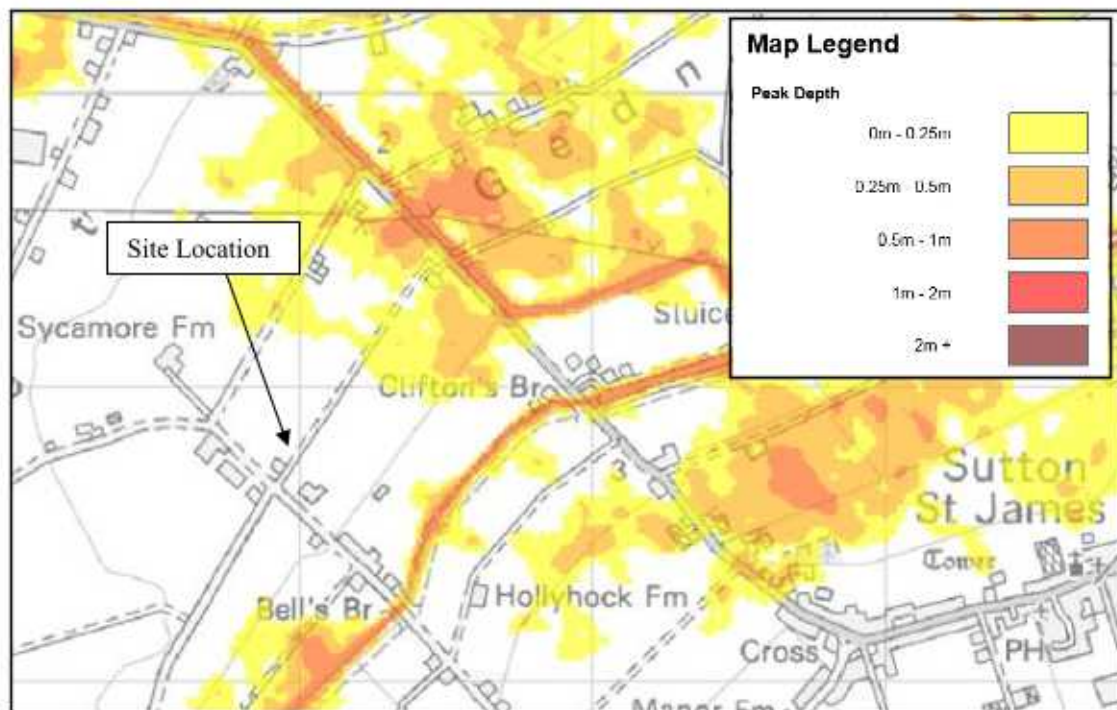


Figure 3 – SFRA 2115 Residual Peak Depth Map

## 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 1% annual probability (1 in 100 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.

The SFRA considers the residual risk associated with overtopping and a breach in the defences in 2115. The maps show that the site is not at risk.

The development increases the impermeable area and therefore has the potential to increase flood risk elsewhere.

### 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 the floor level of the dwelling is 0.3m above surrounding ground level. Furthermore, there should be 0.3m of flood resilient construction above finished floor level.

The developer should ensure that the eventual occupier of the dwelling 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 occupier of the dwelling 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 utilising 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

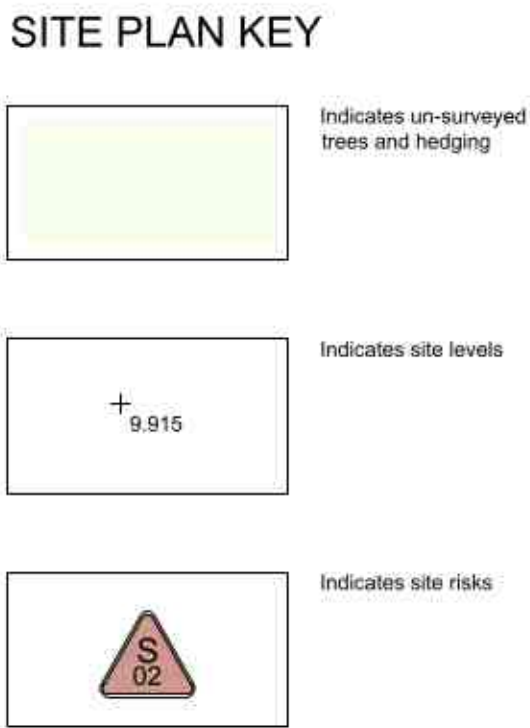
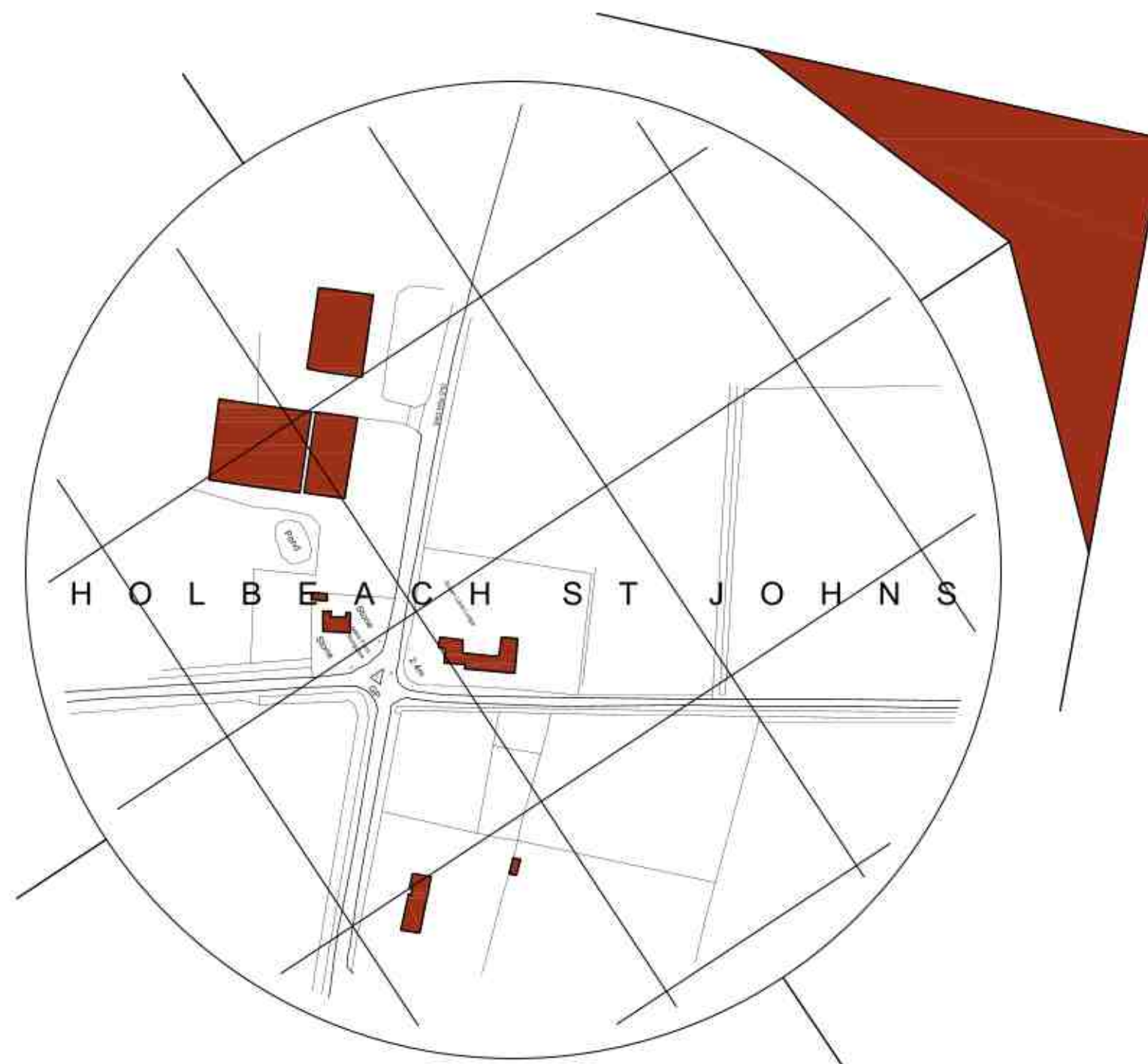
As a result of the assessment, the following conclusions have been reached.

- The proposed development consists of one 2 storey dwelling at Green Lane, Sutton St James.
- 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.
- The proposed development is in Flood Zone 3. The site benefits from defences on the tidal River Nene that provide protection during the 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 floor level of the dwelling is 0.3m above surrounding ground level and there should be 0.3m of flood resilient construction above finished floor level.
- The development passes the Sequential Test and Exception Test and is therefore suitable for the proposed location.

## **ATTACHMENT 1**

**SURVEY DRAWING  
(Dwg SE-2029 100)**

**PLANNING DRAWING  
(Dwg SE-2029 PP1000 A)**



**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.

| <b>SITE RISK NOTIFICATION KEY</b><br>To be used with reference to the accompanying Project Risk Register |                      |     |                  |
|----------------------------------------------------------------------------------------------------------|----------------------|-----|------------------|
| S01                                                                                                      | TP & Overhead Cables | S02 | Electric Fencing |

|        |             |
|--------|-------------|
| Status | AS EXISTING |
|--------|-------------|

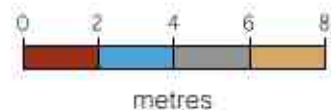
 **SWANN  
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t 01945 450694 e info@swannedwards.co.uk w www.swannedwards.co.uk

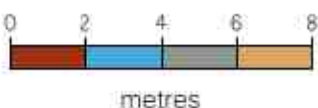
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|--------------------------------------|--|---------|------------|
| Job Title                            |  | Date    | Drawn by   |
| Proposed Dwelling                    |  | October | CW         |
| Adj. Green Lane,                     |  | 2023    | Checked by |
| Holbeach St Johns                    |  |         | GE         |
| For: Mrs K Doubleday-Collishaw       |  |         |            |
| Drawing Title                        |  | Job No. | Sheet Size |
| Survey Drawing                       |  | SE-2029 | A1         |
| Site & Location Plans & Site Section |  | Dwg No. | Revision   |
|                                      |  | 100     |            |



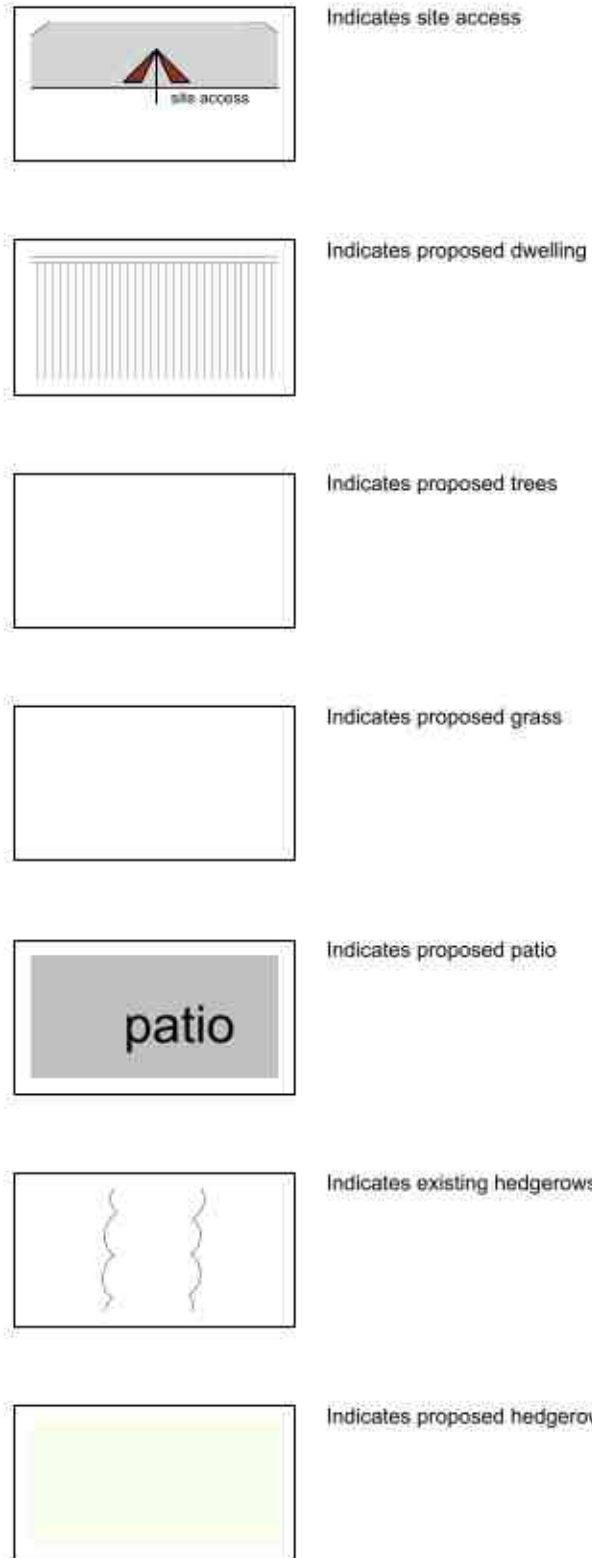
Indicative Green Lane Street Scene / Section A-A  
Scale: 1:200



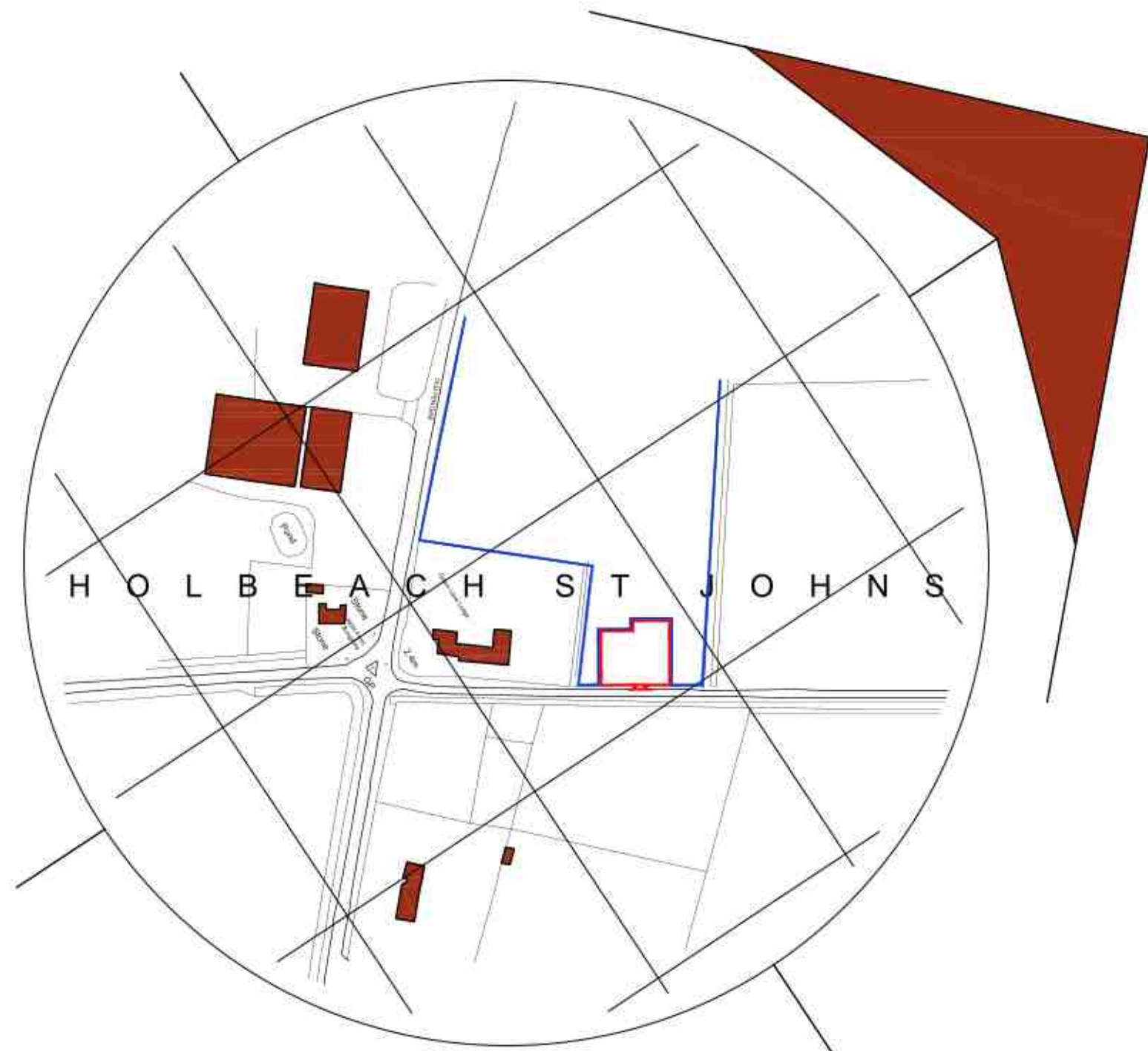
Indicative Site Plan  
Scale: 1:200



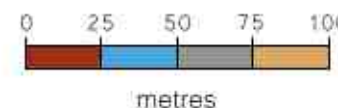
#### SITE PLAN KEY



agricultural field



Location Plan  
Scale: 1:2500



- 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.

| Revisions |        |                 |
|-----------|--------|-----------------|
| A         | Feb 23 | Drawing amended |

| SITE RISK NOTIFICATION KEY                                          |                      |     |                  |
|---------------------------------------------------------------------|----------------------|-----|------------------|
| To be used with reference to the accompanying Project Risk Register |                      |     |                  |
| S01                                                                 | TP & Overhead Cables | S02 | Electric Fencing |

Status: **FOR APPROVAL**

**SWANN EDWARDS**  
ARCHITECTURE

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|                                |                                    |              |            |
|--------------------------------|------------------------------------|--------------|------------|
| For: Mrs K Doubleday-Collishaw | Job Title                          | Date         | Drawn by   |
|                                | Proposed Dwelling                  | October 2023 | CW         |
|                                | Adj. Green Lane, Holbeach St Johns |              | Checked by |
|                                |                                    |              | SHe        |
| Drawing Title                  | Job No.                            | Sheet Size   |            |
|                                | SE-2029                            | A1           |            |
|                                | Dwg No.                            | Revision     |            |
|                                | PP1000                             | A            |            |