FLOOD RISK ASSESSMENT
FOR RESIDENTIAL DEVELOPMENT AT
OLD FEN DIKE, SUTTON ST JAMES

FINAL REPORT

ECL1114-3/SWANN EDWARDS ARCHITECTURE

DATE MARCH 2026

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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 Mr K Groves in respect of a development that consists of a change of use of agricultural buildings to form one residential dwelling at Old Fen Dike, Sutton St James.

A planning application (H20-0124-24) to convert a barn to form one dwelling was approved in April 2024 and an application (H20-0517-25) for the demolition of the barn and construction of a dwelling was approved in September 2025. The proposed development will supersede the approvals granted. A planning application for the proposed development is to be submitted by Swann Edwards Architecture.

The mitigation measures proposed within this Flood Risk Assessment are consistent with those recommended within the Flood Risk Assessment prepared to support the previous application.

2.0 SITE LOCATION AND DESCRIPTION

2.1 Site Location

The site is located at The Barn, Holly Cottage, Old Fen Dike, Sutton St James, Spalding, PE12 0HE. The National Grid Reference of the site is 53852/31682.

The location of the site is shown in Figure 1.



Figure 1 – Location Plan (© OpenStreetMap contributors)

2.2 Existing Site

The site is to the east of Old Fen Dike and on the northern side of a through track that passes Holly Cottage. The site consists of an agricultural building. The area of development is approximately 0.02 hectares.

Environment Agency LiDAR Data shows that ground levels around the barn are typically +1.6m OD and the adjacent access track is at +2.0m OD. The surrounding agricultural land varies from +1.2m OD to +2.0m OD.

The site is in the North Level Internal Drainage Board (IDB) District. Surface water at the site would naturally drain through soakaway and hence to the IDB drain system. There is a riparian drain on the south eastern side of the agricultural building and close to the eastern extent of the site and an IDB Drain 300m north 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 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 provide an indication of the risk from the primary sources of flooding. The details provided with these maps are summarised in Table 1. The depth of flooding identified is the maximum depth that occurs during a low chance (between 0.1% and 1% chance each year) event.

	Present Day		2050 Epoch	
	Chance of Flooding	**Depth (Low chance)**	**Chance of Flooding**	**Depth (Low chance)**
Rivers and the Sea	The site has a low chance (between 0.1% and 1% chance each year)	No data available	No data available	No data available
Surface Water	The site is outside the area with a low chance (between 0.1% and 1% chance each year)	Not at risk	The site is outside the area with a low chance (between 0.1% and 1% chance each year)	Not at risk
Reservoir	Outside of the area at risk.			

Table 1 – Environment Agency Long Term Flood Risk Maps

Table 2 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 2 – 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.

The site has permission for the conversion of an agricultural building to form a dwelling. It is considered that the permissions for the change of use of the building has established the principle for a dwelling at the site. It is proposed that the dwellings that form this application will replace the existing permission.

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 7.6km 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 North Level IDB. There is an IDB Drain 300m north west of the site. The site and the surrounding land are within the Tydd catchment and drain to the North Level Main Drain. The North Level Main Drain discharges into the tidal River Nene at Tydd Pumping Station. The site is 3.8km north west of the North Level Main Drain.

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 3.

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 3 – 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 Tydd 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.

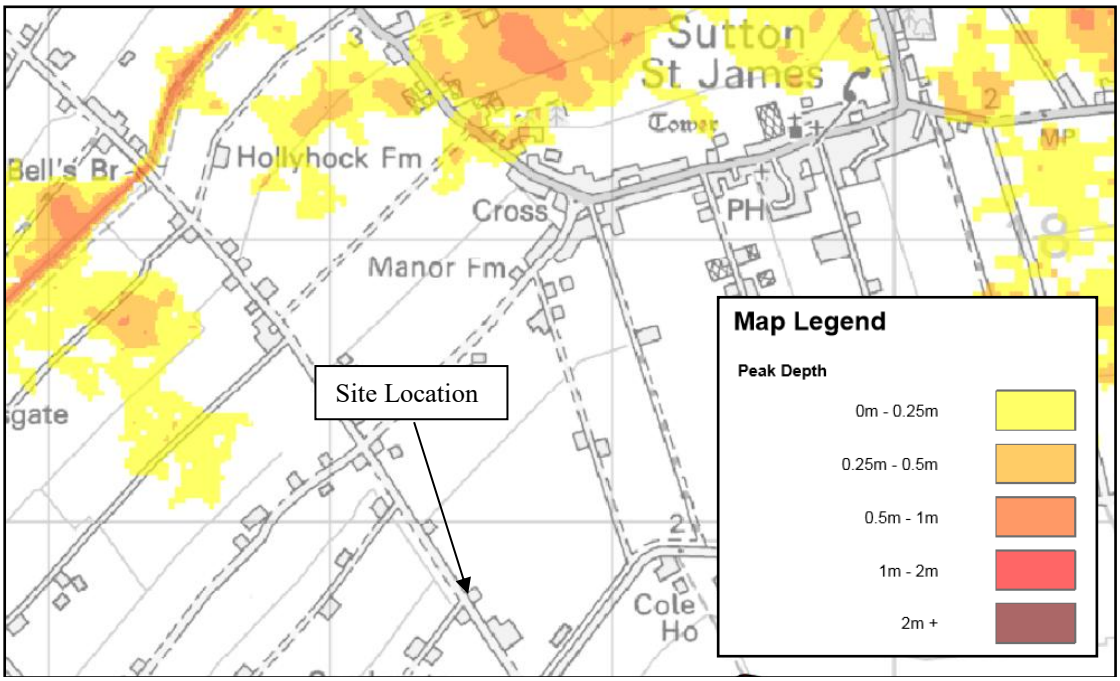


Figure 3 – SFRA 2115 Residual Peak Depth Map

5.0 FLOOD RISK MITIGATION

5.1 Summary of Risks

The probability of this development flooding from localised drainage systems is low. Failure of Tydd 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 proposed development increases the impermeable area and therefore has the potential to increase the rate of surface water runoff from the site.

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, to mitigate against the remote risk of flooding, 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 risk of flooding is lowered as the proposed dwelling has 2 storeys.

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 Fleet Fen 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 one two storey residential dwelling at Old Dike Fen, 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

SITE PLAN
(DWG SE-2470 SS1000)

PLANS, ELEVATIONS & SECTIONS
(DWG SE-2470 PP1100)

Holly Cottage

upgraded existing site access

2.0 x 125m visibility splay

2.0 x 125m visibility splay

drain

exs 1.2m high timber fence

O L D F E N D I K E

drain

exs 1.2m high timber fence

agricultural field
grass

grass

indicates proposed 1.2m high boundary fence

gate

access route to agricultural field

R 01

parking/turning
gravel

car port

gate

R 02 R 03 R 05

garden
grass

gate

indicates proposed 1.8m high boundary fence

indicates proposed 1.2m high boundary fence

garden
grass

gate

R 04

indicates proposed 1.2m high boundary fence

indicates proposed 1.2m high boundary fence

ELEC

ep

agricultural field
grass

agricultural field
grass

drain

N

0 2 4 6 8
metres

Site Plan
Scale: 1:200

Swann Edwards Architecture Limited ©

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.

SITE PLAN KEY

- Indicates footprint of existing barn with class Q approval, under reference: H20-0124-24, to be demolished
- Indicates proposed dwelling
- Indicates surveyed buildings off-site
- Indicates un-surveyed buildings taken from OS map
- Indicates proposed boundary treatment
- Indicates indicative location of proposed soft landscaping - subject to change following landscape design and bio-diversity net gain calculations
- Indicates existing access to be utilised and upgraded with hard bound material to meet with Lincolnshire's County Council specification and to achieve 2.0m x 125m vehicular visibility splays
- R 01 — Indicates site risk identified through RIBA stages 1-4, please refer to accompanying Project Risk Register

SITE RISK NOTIFICATION KEY

To be used with reference to the accompanying Project Risk Register

R01	Unknown Services	R02	Potential Asbestos
R03	Potential Contamination	R04	Overhead Cable
R05	Demolition		

Status

FOR COMMENT

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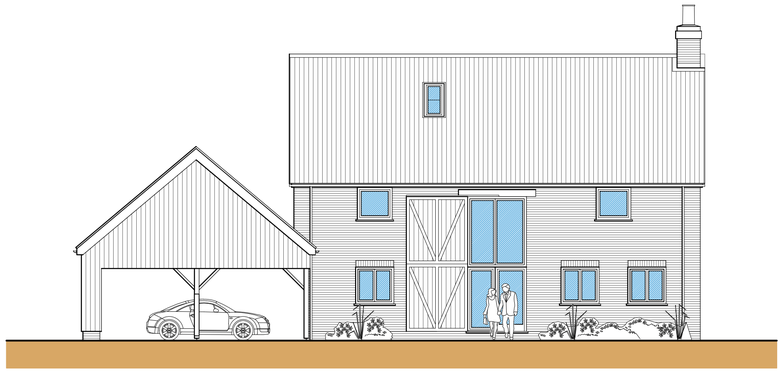
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Job Title
Proposed Dwelling at Land Adj. The Barn, Holly Cottage, Old Fen Dike, Sutton St James, PE12 0HE

Date: January 2026
Drawn by: GT
Checked by: RS

Drawing Title
Sketch Scheme Site Plan

Job No.: SE-2470
Sheet Size: A1
Dwg No.: SS1000
Revision:



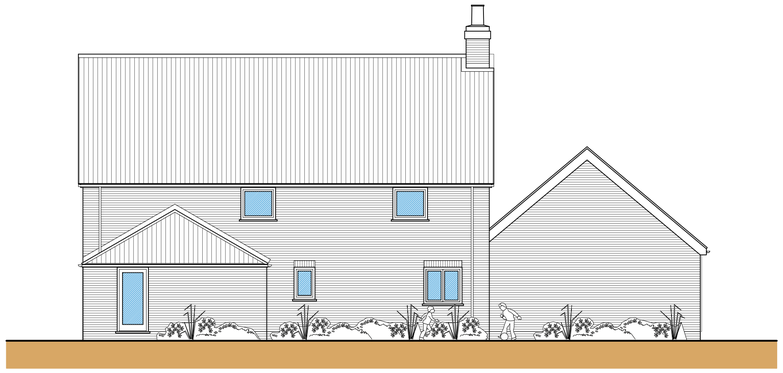
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metres



Side Elevation (SE)
Scale: 1:100

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metres



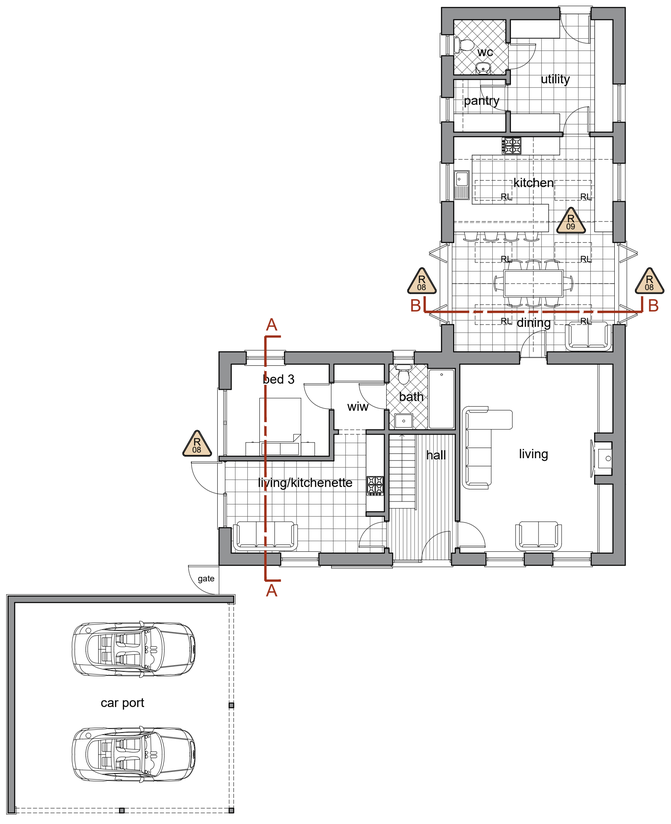
Rear Elevation (NE)
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metres



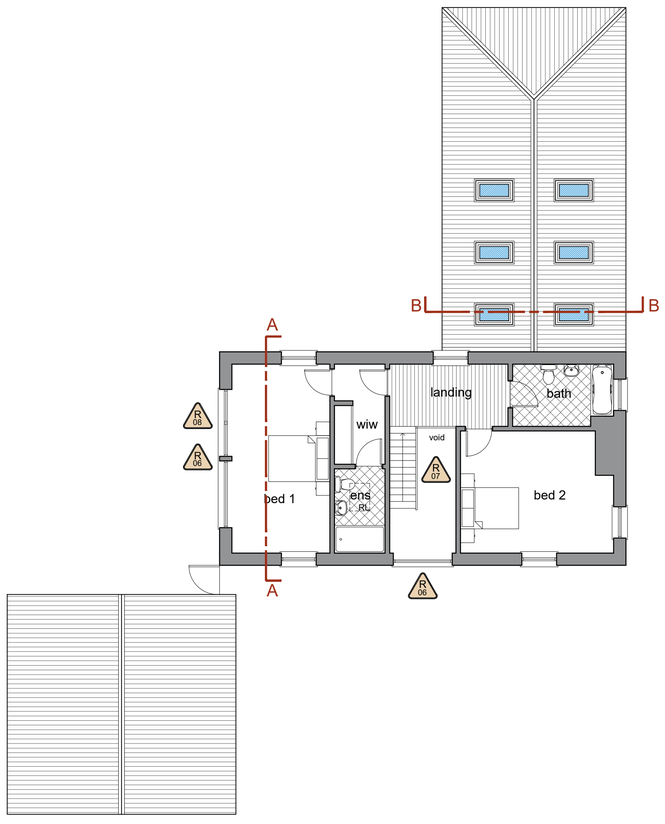
Side Elevation (NW)
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metres



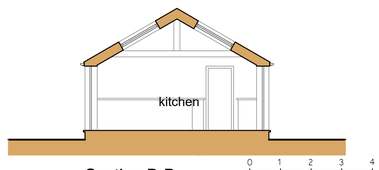
Ground Floor Plan
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metres



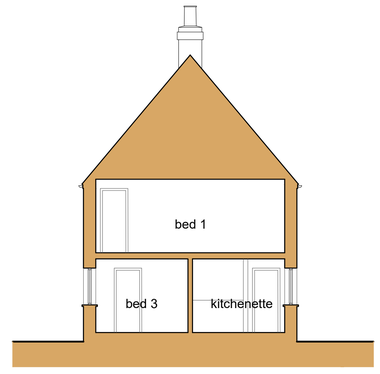
First Floor Plan
Scale: 1:100

0 1 2 3 4
metres



Section B-B
Scale: 1:100

0 1 2 3 4
metres



Section A-A
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.

MATERIAL KEY

Indicates brickwork to be confirmed by client

Indicates vertical metal sheet cladding to be confirmed by client

Indicates metal sheet roof cladding to be confirmed by client

Indicates proposed joinery to be confirmed by client

SITE RISK NOTIFICATION KEY

To be used with reference to the accompanying Project Risk Register

R06	High Level Glazing	R07	Two-Storey Height
R08	Structural Steelwork		

Status

FOR PLANNING

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Job Title
Proposed Dwelling at Land Adj. The Barn, Holly Cottage, Old Fen Dike, Sutton St James, PE12 0HE

Drawing Title
Planning Drawing
Plans, Elevations & Sections

Date: February 2026	Drawn by: GT
	Checked by: RS
Job No.: SE-2470	Sheet Size: A1
Dwg No.: PP1100	Revision:

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