# FLOOD RISK ASSESSMENT
# FOR INDUSTRIAL DEVELOPMENT
# BOUD MINERALS, WEST BANK, SUTTON BRIDGE

**FINAL REPORT**

**ECL1927/G R MERCHANT**

**DATE NOVEMBER 2026**

**ELLINGHAM CONSULTING LTD**
Email: tim@ellinghamconsulting.co.uk

**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 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 CONCLUSION

ATTACHMENT 1 – Site Plan & Proposed Location Plan (Dwg 4539-26 03)

*DISCLAIMER*

*This document has been prepared solely as a Flood Risk Assessment in support of a planning application for proposed industrial development at Cross Keys, Sutton Bridge. "Ellingham Consulting Ltd" accepts no responsibility or liability whatsoever for any use made of this document other than by the client "G R Merchant" for the purposes it was originally commissioned and prepared. All comments and opinions made are based upon information available to "Ellingham Consulting Ltd" during the necessary investigative process, and the conclusions and recommendations, could therefore, differ in the event of material subsequently being found erroneous, incomplete, or misleading. "Ellingham Consulting Ltd" therefore, accepts no liability should this prove to be the case.*

# 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 G R Merchant in respect of a development that consists of open frontage storage units at Boud Minerals, Cross Keys, Sutton Bridge.

A planning application for the proposed development is to be submitted by G R Merchant.

# 2.0 SITE LOCATION AND DESCRIPTION

## 2.1 Site Location

The site is located at Boud Minerals, Cross Keys, Sutton Bridge, Lincolnshire, PE12 9XE. The National Grid Reference of the site is 54802/32098.

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 western side of the A17. The site is within the curtilage of an industrial site that comprises warehouses, storage sheds and hardstanding areas. The proposed development is to be located on an area of hardstanding. The area of development is 0.3 hectares.

Environment Agency LiDAR shows that ground levels within the site are between +4.9m OD and +5.4m OD. Ground levels within the northern part of the site rise up from +5.0m OD to +5.4m OD.

The site is in the South Holland Internal Drainage Board (IDB) District. Surface water at the site naturally drains through soakaway and hence to the IDB drain system. There is an IDB High Priority Watercourse, the Sutton Bridge Side Dyke No 1, approximately 200m south of the site.

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

## 2.3 Proposed Development

The proposed development consists of two open frontage storage units. Details of the proposed development are shown 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 1, an area with a low probability of flooding.

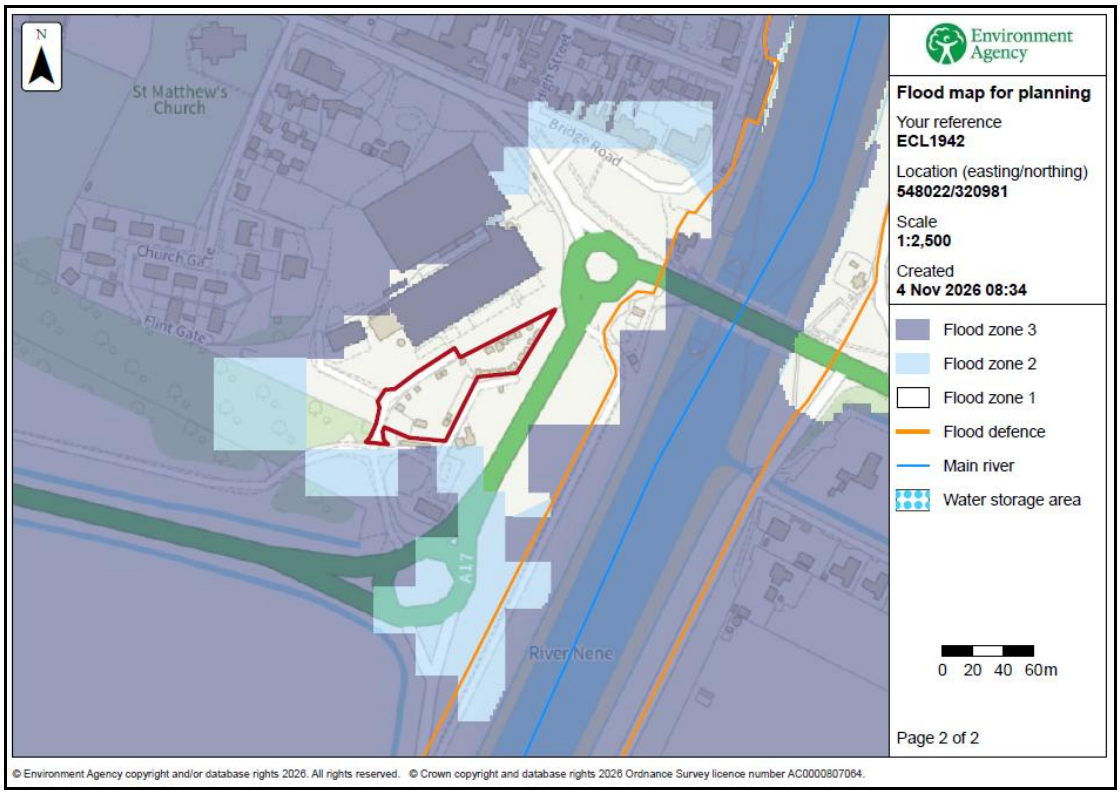



Figure 2 – Environment Agency Flood Map for Planning

The Flood Map for Planning shows that during the event with a 1 in 100 annual likelihood the site is not at risk of surface water flooding. When climate change is considered during this return period event there is surface water flooding alongside the site access. The footprint of the storage is not at risk.

The Environment Agency Long Term Flood Risk maps provide an indication of the risk from the primary sources of flooding. The map shows that the site is outside of the 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 | Year 2116 |
|---|---|---|
| Residual Flood Hazard Map for the 1% fluvial and 0.5% tidal event | The site is predominantly in the 'Danger for Some' area | The site is in the 'Danger for Most' area |
| Residual Peak Depth Map for the 1% fluvial and 0.5% tidal | The peak flood depth is between 0.5m and 1.0m | The peak flood depth is greater than 2m. |

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

Annex F (Table 2) of NPPF categorises different types of uses and development according to their vulnerability to flood risk. The proposed development is covered by the description of general industry and is classified as 'Less Vulnerable'.

Annex F (Table 3) of NPPF sets out Flood Risk Vulnerability and flood zone 'compatibility'. The site is in Flood Zone 1 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.

The proposed development will form an extension to the existing development within the wider site. It would not be practicable to undertake the development at an alternative location. The proposal is considered to pass the Sequential Test.

# 4.0 SITE SPECIFIC FLOOD RISK

## 4.1 Local Flood Assets

The site is 50m west of the tidal River Nene. The site is protected by the River Nene tidal defences through 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 High Priority Watercourse approximately 200m south of the site. The site and the surrounding land are within the Free Discharge catchment and discharge to the tidal River Nene at the Sutton Bridge Tidal Sluice. The site is 1.9km north of the South Holland 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 2.

| Source of Flooding | Level of Risk |
|---|---|
| Drainage Network Flooding | The risk is assessed in Section 4.3. |
| Surface Water Flooding | The footprint of the proposed storage units is not at risk of surface water flooding. |
| Fluvial Flooding | The risk is assessed in Section 4.3 & 4.5. |
| Tidal Flooding | The risk is assessed in Section 4.3, 4.5 & 4.6. |
| Reservoir Flooding | The site is not at risk of reservoir flooding. |
| 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 Sutton Bridge Tidal Sluice could lead to an increased level of risk in the IDB 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 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 site is not at risk for the design life of the development (i.e., 100 years).

## 4.6 Residual Risk

There is a residual risk of flooding at the site should a breach of the tidal defences occur. The South East Lincolnshire SFRA includes maps demonstrating the residual peak depth in 2115. 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 200 chance each year) tidal event the peak breach depth in the area of the proposed development is greater than 2m. An extract from this map is shown in Figure 3.

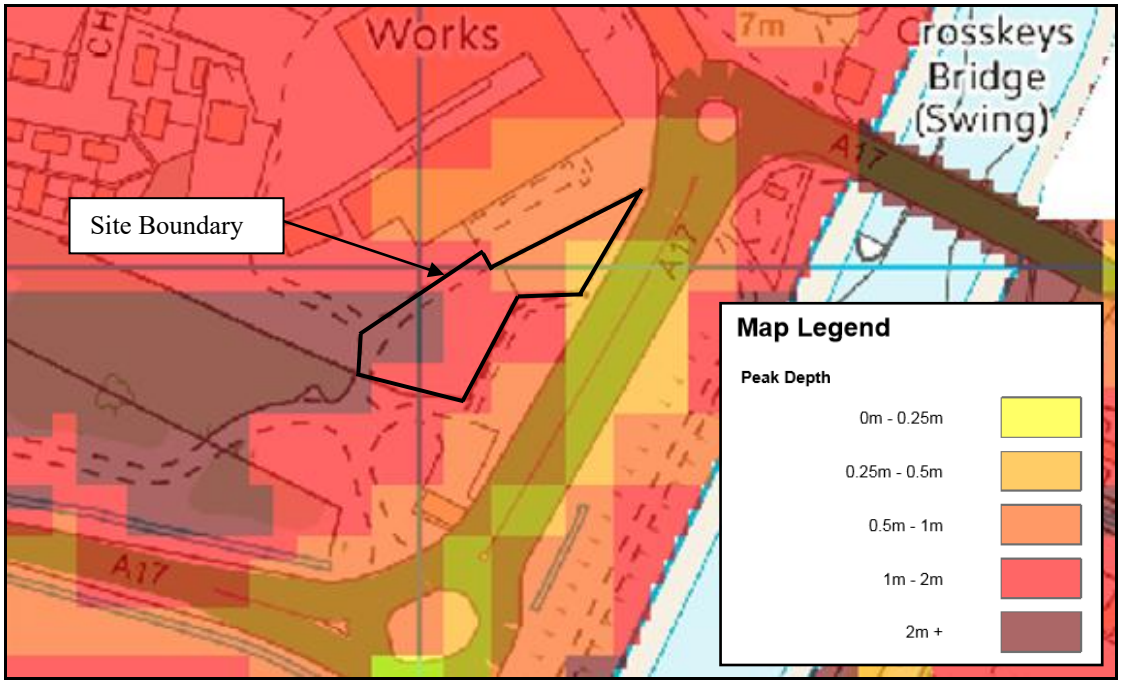



Figure 3 – SFRA 2115 Residual Peak Depth Map

# 5.0 FLOOD RISK MITIGATION

## 5.1 Summary of Risks

The probability of this development flooding from localised drainage systems is low. Failure of Sutton Bridge Sluice could lead to an increased level of risk within the IDB catchment.

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 peak flood depth in the area of the proposed storage units is greater than 2m.

There will be no increase in impermeable area associated with the development so there is no potential that flood risk will be increased elsewhere.

## 5.2 Mitigation Measures

Based upon the information available during the preparation of this flood risk assessment, to mitigate against the risk of a breach, the following flood resilience measures are recommended:

- there is a water entry strategy allowing flood water to enter the structure and drain freely from it;
- any electrical supply and components are elevated above the flood level;
- the user of the site should register to receive flood warnings from the Environment Agency to reduce the vulnerability of people at the site; and
- the user of the site should identify the actions to be undertaken in the event of receiving a flood warning.

Should there be a failure of Sutton Bridge Tidal Sluice 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 development will not affect any adjoining properties or increase the flood risk elsewhere.

# 6.0 CONCLUSION

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

- The proposed development consists of two open frontage storage units at Boud Minerals, Cross Keys, Sutton Bridge.

- 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 1. The River Nene tidal defences provide protection during the 0.5% annual probability (1 in 200 chance each year) event. During the design life of the development, including an allowance for climate change, it is not anticipated that there would be flooding at the site.

- The maximum breach depth during the 0.5% annual probability (1 in 200 chance each year) tidal event in 2115 is greater than 2m.

- It is recommended that flood resilience measures are adopted to manage the risk of a breach. These include a water entry strategy, elevating services above the flood level, and reducing the vulnerability of people.

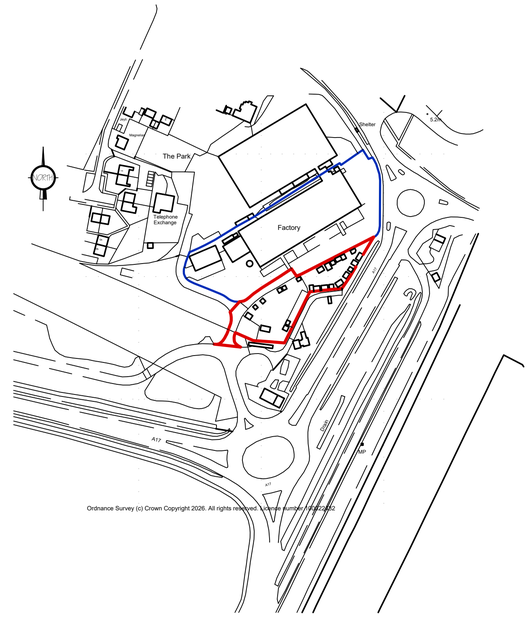
- The development passes the Sequential Test and is therefore suitable for the proposed location.

# ATTACHMENT 1

# SITE PLAN & PROPOSED LOCATION PLAN
# (DWG 4539-26 03)




SITE PLAN - 1:500




LOCATION PLAN 1:2500

| ref: | revision | date |
|---|---|---|
| | | |

**G. R. MERCHANT LTD.**

**ARCHITECTURAL CONSULTANTS**

**4 Wrights Mews**
**12A Park Road, Holbeach,**
**Spalding, Lincs. PE12 7EE**
**Tel: 01406 490800**
**E-Mail: office@grmerchantltd.com**
**Website: www.grmerchantltd.com**

Project
PROPOSED OPEN FRONTAGE STORES
CROSS KEYS
SUTTON BRIDGE
SPALDING, LINCS.

Client
BOUD MINERALS LTD

Drawing
SITE PLAN - PROPOSED
LOCATION PLAN

| Job Ref. | Drawing No. |
|---|---|
| 4539-26 | 03 |
| **Date** | **Drawn** |
| OCTOBER 2026 | SLB |

Scales
1:100 & 1:200 ( Unless Otherwise Stated)

**DO NOT SCALE FROM THIS DRAWING**

This drawing is copyright and may not be altered, traced, photographed or used for any other purpose other than that for which it is issued. The General Contractor is to check all dimensions on site and report any discrepancies to G. R. Merchant Ltd. All details shown on this drawing including foundations are based upon typical site conditions related to the area. No responsibility can be accepted for abnormal conditions which may be discovered during construction unless reported to the G. R. Merchant Ltd so that design amendments may be considered. Site soil surveys are recommended in respect of foundations to establish specific site conditions before foundation work is undertaken. This drawing is limited in the amount of information contained and does not purport to contain a full specification of the works. It is solely for the purpose of obtaining Planning / Building Regulation approval. This drawing must not be used as a contract document alone. The works will not be supervised or inspected on site by G R Merchant Ltd or any representative thereof. It is the client or their appointed contractor(s) responsibility to control workmanship, substitution of materials, adherance to specification, variations to contract etc.All materials to be new unless otherwise stated and all components and materials etc. to be used fitted and installed etc. in strict accordance with manufacturers instruction and relevant code of practice. Materials shall conform to appropriate British standard specification or BBA certificate or European code equivalent. The Employer / Client shall ensure that the selected contractor is conversant with and adopts all measures necessary to achieve compliance with Health and Safety legislation for Building sites and Work places. The Employer / Client is advised that should the works need to comply with the Construction Design and Management Regulations an independent Principal Designer will be required. The works shall comprise of all that is shown on the drawing and details. Work that may not specifically be shown but may be reasonably inferred as necessary to carry out the works shall be deemed to be included. It is the plot / land owners responsibility to be aware of the Party Wall etc. Act 1996: when building in close proximity to adjoining neighbours boundaries.