FLOOD RISK ASSESSMENT
FOR RESIDENTIAL DEVELOPMENT AT
CLAY DROVE, WEST PINCHBECK

FINAL REPORT

ECL1435-2/SWANN EDWARDS ARCHITECTURE

DATE FEBRUARY 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 Smith in respect of a development that consists of a dwelling on Clay Drove, West Pinchbeck.

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 4 Clay Drove, West Pinchbeck, Spalding, Lincs, PE11 3NB. The National Grid Reference of the site is 52133/32244.

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 Clay Drove. The site consists of an area of land within the curtilage of 4 Clay Drove and an undeveloped plot on the eastern side of Clay Drove. There are dwellings to the east and west of the site and agricultural land to the north. The area of development is approximately 0.25 hectares.

Environment Agency LiDAR shows that the site is flat with ground levels between +1.7m OD and +1.9m OD. Ground levels in the area of the proposed dwelling ate +1.8m OD. The agricultural land in the vicinity of the site is typically between +1.0m OD and +1.8m OD. The carriageway level of Clay Drove adjacent to the site is +2.4m OD.

The site is in the Welland & Deepings Internal Drainage Board's (IDB) district. Surface water at the site would naturally drain through soakaway and hence to the IDB drain system. There is a riparian drain 130m north of the site and the nearest IDB main drain, Blue Gowt No 2, is 200m east of the site.

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

2.3 Development

The development consists of a dwelling. The dwelling will have two storeys. The Site and Location Plan for the development is 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 Available Flood Risk Information

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

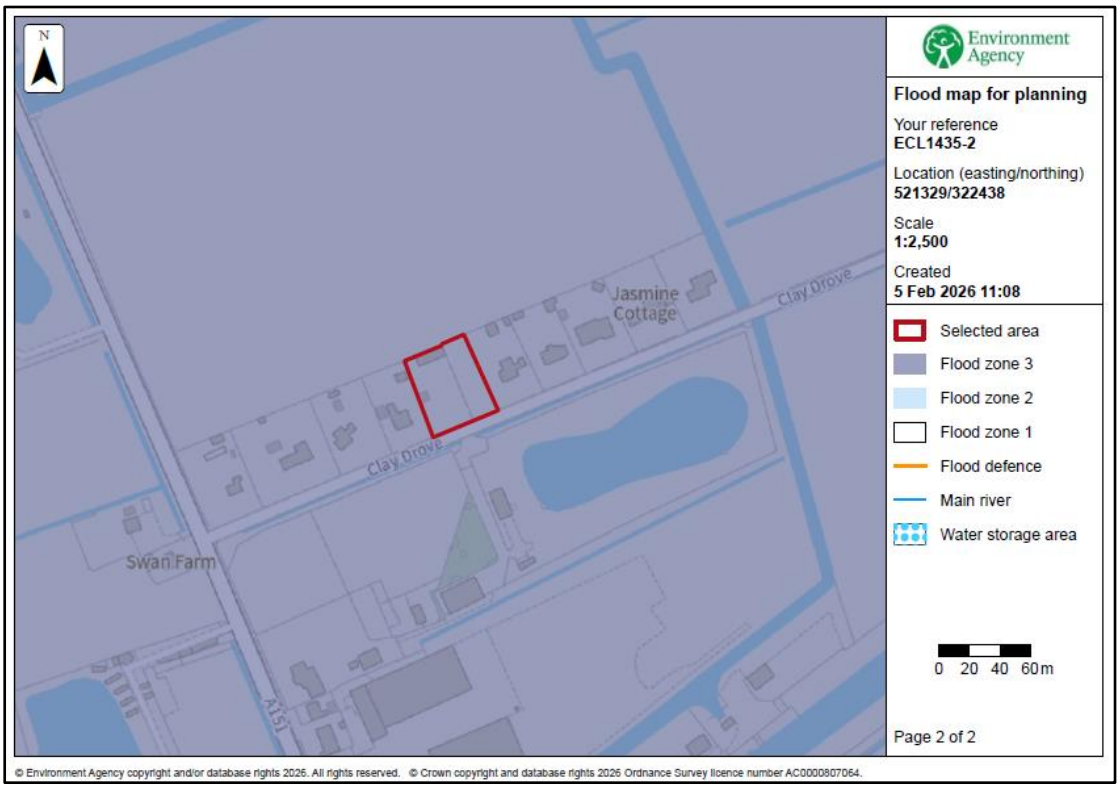


Figure 2 – Environment Agency Flood Map for Planning

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 depths 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	
	Risk of Flooding	**Depth (Low chance)**	**Risk of Flooding**	**Depth (Low chance)**
Rivers and the Sea	The site has a very low chance (less than 0.1% chance each year)	No data available	No data available	No data available
Surface Water	The site is outside the area with a low risk (between 0.1% and 1% chance each year)	Not at risk	The site is outside the area with a low risk (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 residual risk at the outbuilding to be converted as identified within the South East Lincolnshire SFRA.

SFRA Map	Present Day	2116
Residual Flood Hazard Map for the 0.1% fluvial and tidal event	The outbuilding is in the 'Danger for Most' area	The outbuilding is in the 'Danger for Most' area
Residual Peak Depth Map for the 0.1% fluvial and tidal event	The peak flood depth is 0.5m to 1.0m	The peak flood depth is 1.0m to 2.0m

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 in 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 Test 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 to the River Welland lie within Flood Zone 3. As such, opportunities to undertake the development at an alternative site with a lower flood risk are limited. The Environment Agency Flood Maps for Planning show that the whole of Spalding is within Flood Zone 3. 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 River Welland has defences that provide protection during the 1% annual probability (1 in 100 chance each year) fluvial event including climate change. 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 the need for more housing.

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 3.0m north west of the River Welland and the Cowbit Wash. Cowbit Wash is the floodplain to the River Welland and the site is protected from the River Welland by the Welland Bank.

The site is 2.5km south of the River Glen. The risk of flooding at the site is reduced by an embankment on the southern bank of the River Glen.

The Cowbit Wash, the River Glen, and River Welland defences are 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 Welland and Deepings IDB. The nearest IDB main drain, Blue Gowt No 2, is 200m east of the site. The site and the surrounding land are within the Fourth District catchment and drain in a southerly direction to Fourth District Pumping Station. Fourth District Pumping Station discharges to Vernatts Drain which flows into the River Welland at Surfleet.

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 Welland and Deepings 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 Section 4.5.
Tidal Flooding	The risk is assessed in Section 4.3 and Section 4.5.
Reservoir Flooding	The risk of a breach is considered in Section 4.6.
Groundwater Flooding	Based upon the local drainage network the risk is low.

Table 3 – Sources of Flooding

4.3 Probability of Flooding

The probability of flooding associated with blockages in the Welland and Deepings IDB drainage system is low due to the maintenance standards achieved and managed by the IDB.

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 Welland and Deepings IDB main drains incorporating freeboard. This freeboard provides storage during the exceedance events.

The fluvial defences on the River Glen provide protection against the 1% annual probability (1 in 100 chance each year) event. Flood levels in the Welland Catchment Model show that the 1% annual probability (1 in 100 chance each year) level in the River Glen is +4.46m OD with defence levels in excess of +5.0m OD.

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.

Flood levels taken from the Welland Catchment Model show that the 1% annual probability (1 in 100 chance each year) with climate change flood level in the River Glen is +4.76m OD. This represents a 0.30m increase on the present day 1% annual probability level. This increase is less that the freeboard provided by the existing defences and therefore the site is protected from overtopping during the life of the development.

The River Welland defences provide protection during the 1% annual probability (1 in 100 chance each year) tidal event including climate change.

4.6 Residual Risk

There is a residual risk of flooding at the site should a breach occur in the defences. The South East Lincolnshire SFRA includes maps demonstrating the impact of a breach in 2116. The Residual Peak Depth maps within the SFRA indicate the maximum flood depths associated with a breach and overtopping of defences.

An extract from the residual peak flood depth map for 2115 (1% fluvial annual probability and 0.5% tidal annual probability) is shown in Figure 3.

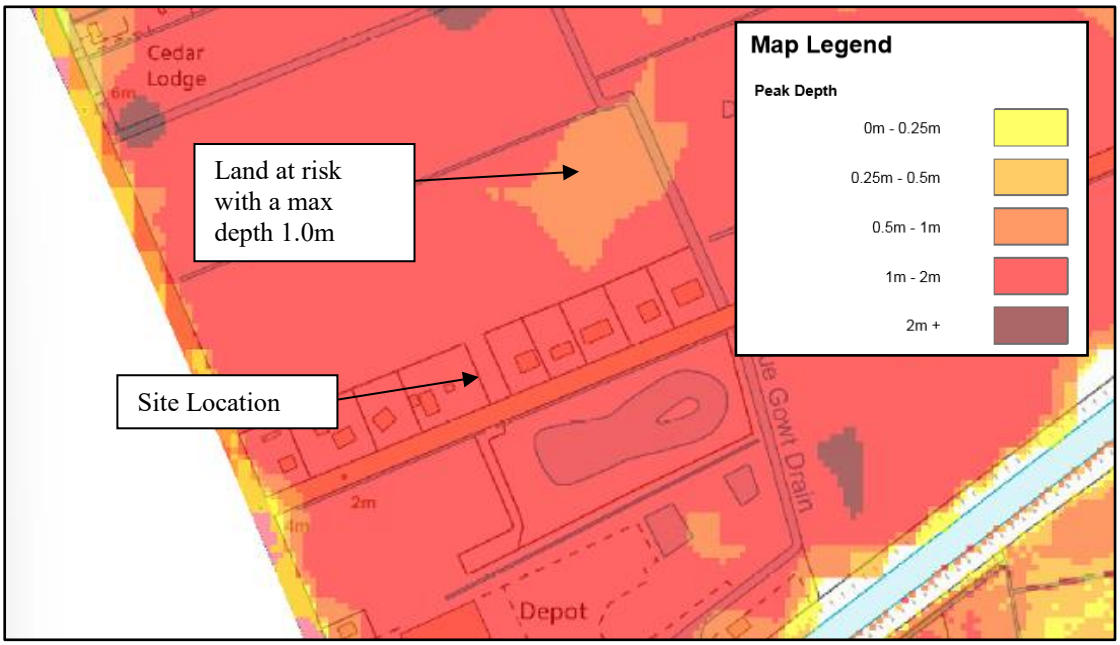


Figure 3 – SFRA 2115 Residual Peak Depth Map

Through a comparison of the flood depths in Figure 3 and Environment Agency LiDAR the flood level has been estimated. An area of agricultural land to the north east of the site is at risk with depths up to 1.0m. As shown in Figure 4, LiDAR shows that ground levels in this area are above +2.0m OD.

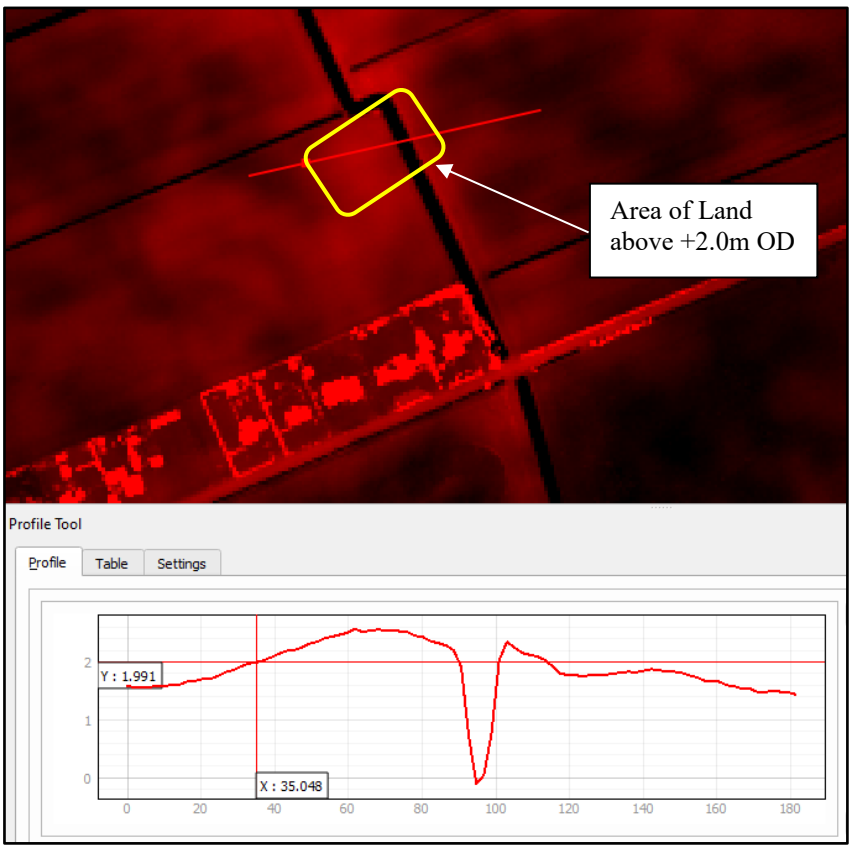


Figure 4 – LiDAR Ground Levels

A conservative estimate of the flood level during the breach event in 2115 is +3.0m OD, a depth of up to 1.2m in the area of the proposed dwelling.

5.0 FLOOD RISK MITIGATION

5.1 Summary of Risks

The probability of this development flooding from localised drainage systems is low. Failure of Fourth District Pumping Station could lead to an increase 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 a breach in the defences. The site is at risk during a breach of defences with a flood depth up to 1.2m.

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 proposed mitigation against the residual risk of flooding is in line with the South East Lincolnshire Standing Advice. It is recommended that:

- the finished floor level of the dwelling is 1.0m above surrounding ground level;
- there is 0.6m of flood resistant construction (demountable defences) above finished floor level; and
- there is flood resilient construction to 0.6m above finished floor level (0.3m above flood 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 Fourth District Pumping Station and conditions were such to put properties and land at risk of flooding, the IDB 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 development consists of a two storey dwelling at 4 Clay Drove, West Pinchbeck, Spalding.

- 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 partly in Flood Zone 3. The site is protected 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. 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 site is at risk during a breach of the defences with a flood depth up to 1.2m.

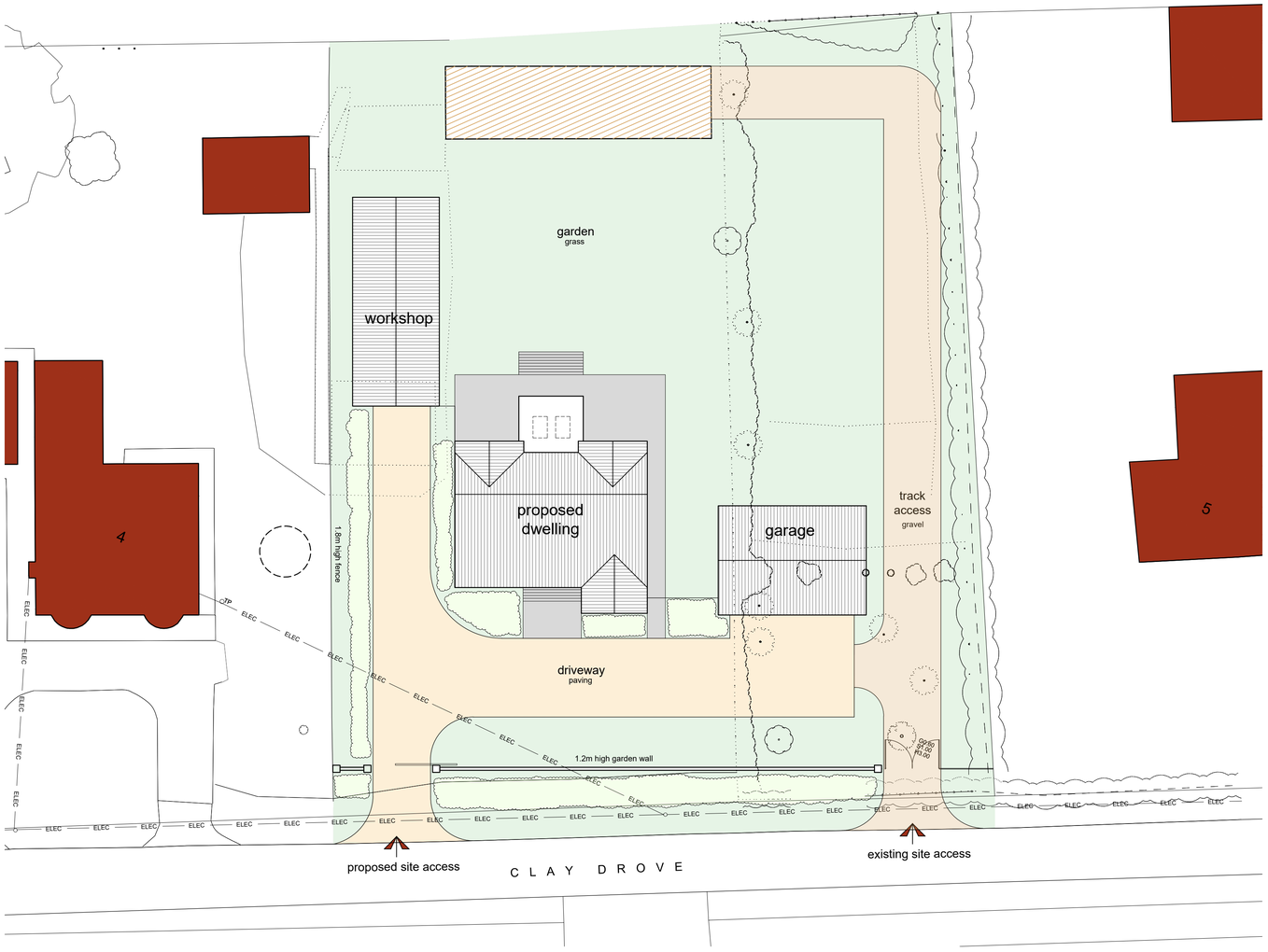
- It is proposed that the finished floor level of the dwelling are 1.0m above surrounding ground level and there is 0.6m of flood resistant and flood resilient (recovery) construction above finished floor level.

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

ATTACHMENT 1

SITE & LOCATION PLAN
(DWG SE-2444 PP1000)

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
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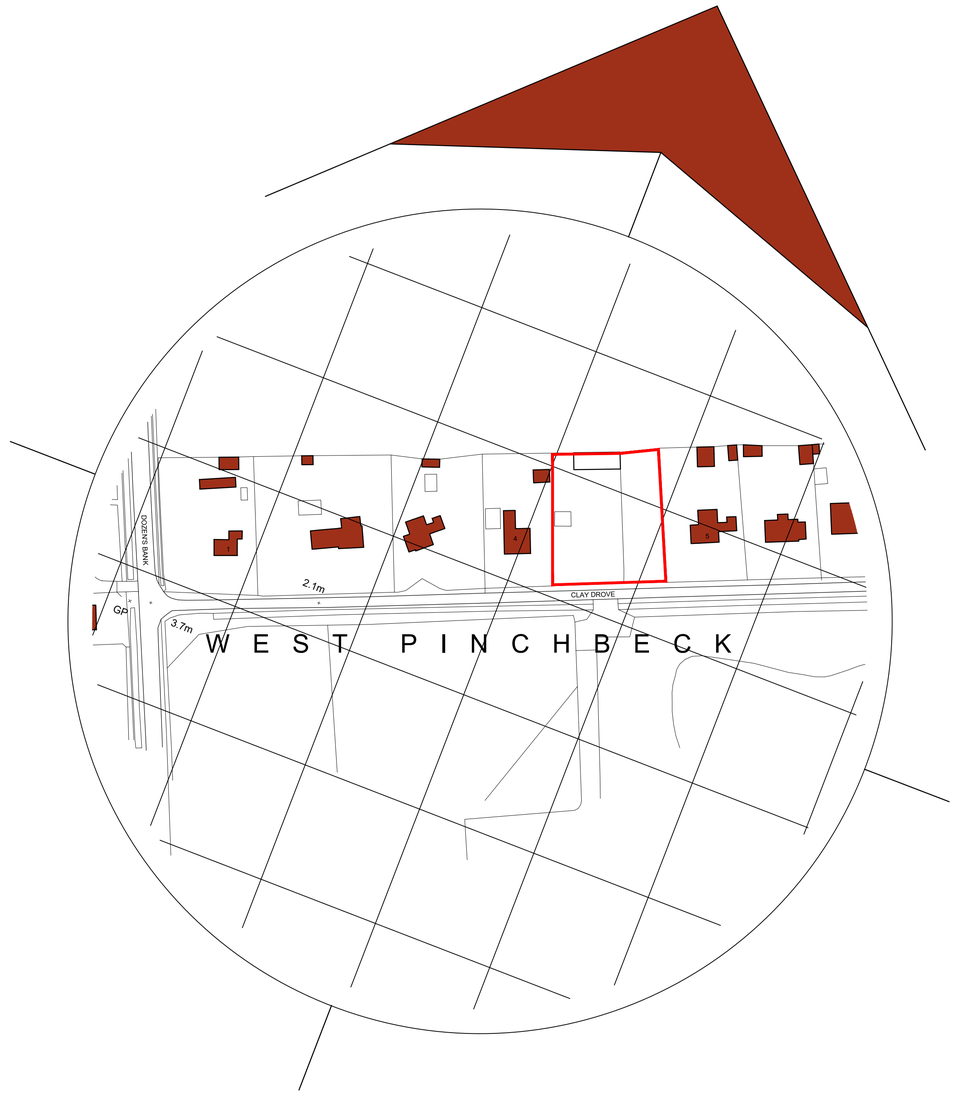

Location Plan
Scale: 1:2500
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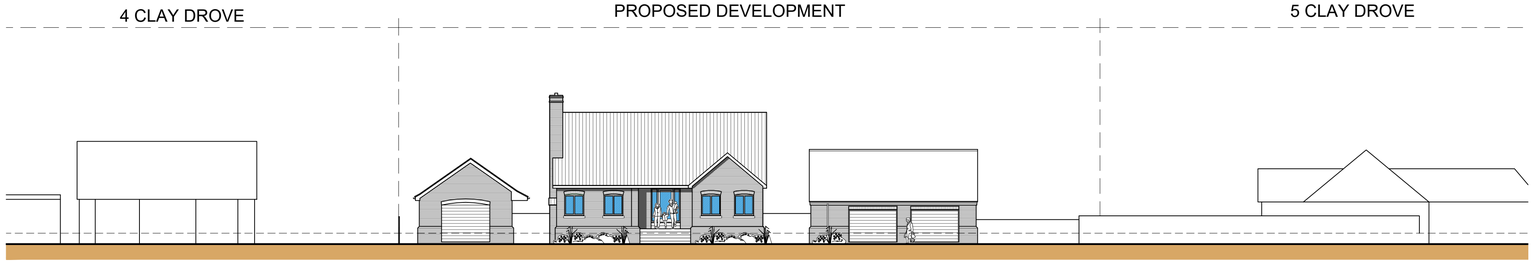
metres

SITE PLAN KEY

- Indicates proposed buildings
- Indicates existing buildings taken from OS Maps
- Indicates proposed driveway
- Indicates proposed pathways
- Indicates existing vegetation to demolish
- Indicates position of proposed vegetation
- Indicates existing outbuildings on site taken from OS Map



Street Elevation
Scale: 1:200
0 2 4 6 8
metres

Status
PLANNING

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Job Title
Proposed 1no. Self Build Plot
4 Clay Drove, West Pinchbeck
PE11 3NB
For: Mr Smith

Drawing Title
Planning Drawing
Site & Location Plan

Date	Drawn by
Jan 2026	AL
	Checked by

Job No.	Sheet Size
SE-2444	A1
Dwg No. PP1000	Revision