

FLOOD RISK ASSESSMENT

PROPOSED RESIDENTIAL DEVELOPMENT
BROADGATE NURSERIES,
BULLOCK'S SHORT GATE
GEDNEY BROADGATE
HOLBEACH
PE12 0DG

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Flood Risk Assessment Proposed Residential Development. Broadgate Nurseries, Bullocks Shortgate, Gedney Broadgate, Holbeach. PE12 0DG

INTRODUCTION

The Government has placed increasing priority on the need to take full account of the risk associated with flooding at all stages of the planning and development process. This seeks to reduce the future damage to property and the risk to life from incidents of flooding. Their expectations relating to flooding are contained in the National Planning Policy Framework December 2023, (NPPF), which identifies how the issue of flooding is dealt with in the drafting of planning policy and the consideration of planning applications by avoiding inappropriate development in areas at risk from flooding and to direct development away from areas at highest risk.

The NPPF provides that development in areas at risk of flooding should be avoided and seeks to direct development away from areas at highest risk. There is a sequential, risk-based approach to the location of development avoiding where possible, flood risk to people and property managing any residual risk and taking account of the impacts of climate change.

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APPLICATION SITE

The site is located off Bullock's Short Gate, Gedney Broadgate, PE12 0BG within the administrative area of South Holland District Council. The National Grid Reference is TF 40090 21524. **Plan 1**

This flood risk assessment has been prepared for a planning permission, for the erection of 2 No two storey detached dwellings. The proposal should be viewed in the light of an established fallback position under Class Q of the GPDO. The prior approval application for the permitted development right allowed for the conversion of the existing agricultural building to form 2 No dwellings. Planning Ref. H06-0868-23 dated 27th November 2023.

Plans 2, 3, 4, 5, & 6

The National Planning Policy Framework Guidance NPPG defines three levels of flood risk depending upon the annual probability of fluvial flooding occurring.

Zone 1 – Low Probability (<0.1%)

Zone 2 – Medium Probability (0.1 – 1.0%)

Zone 3 – High Probability (>1.0%)

The proposed development site is shown to be within an area of Flood Zone 3a 'High Probability' as detailed on the Environment Agency's Flood Zone Maps without defences, and as defined in Table 1 of NPPG.. The maps indicate that the area would be flooded without flood defences.

Table 1: Flood Zones Definition

Flood Zone 3- High Probability
Definition. Land assessed as having a 1 in 100 or greater annual probability of river flooding (>1%) or a 1 in 200 or greater annual probability of flooding from the sea (>0.5%) in any year. The water-compatible and less vulnerable uses of land are appropriate in this zone. The highly vulnerable uses should not be permitted in this zone. The more vulnerable and essential infrastructure uses should only be permitted in this zone if the Exception Test is passed. Essential Infrastructure permitted in this zone should be designed and constructed to remain operational and safe for uses in times of flood. Flood Risk Assessments requirements. All proposals in this zone should be accompanied by a Flood Risk Assessment. Policy aims. Developers and local authorities should seek opportunities to: • reduce the overall level of flood risk in the area through the layout and form of the development and the appropriate application of sustainable drainage techniques. • relocate existing development to land with a lower probability of flooding. • create space for flooding to occur by allocating and safeguarding open space for flood storage.

Applying the Flood Risk Vulnerability Classification in Table 2 of NPPG, the proposed residential use for the site is classified as 'More Vulnerable' as set out in Table 2, the change of use is appropriate in this zone subject to the exception test.

Table 2: Flood Risk Vulnerability Classification

More Vulnerable
• Hospitals • Residential institutions such as residential care homes, children's homes, social services homes, prisons, and hostels. • Buildings used for: dwelling houses; student halls of residence; drinking establishments; nightclubs; and hotels. • Non-residential uses for health services, nurseries, and educational establishments • Landfill and sites used for waste management facilities for hazardous waste. • Sites used for holiday or short-let caravan and camping, subject to a specific warning and Evacuation Plan.

Site Levels

The topographical survey to OS datum, reveals that the site is generally flat, with an average ground level around the barn of 2.90mODN with an FFL of 3.20mODN. Bullock's Short Gate road level is circa 3.02mODN. **Plan 7**

DRAINAGE AUTHORITIES

Environment Agency

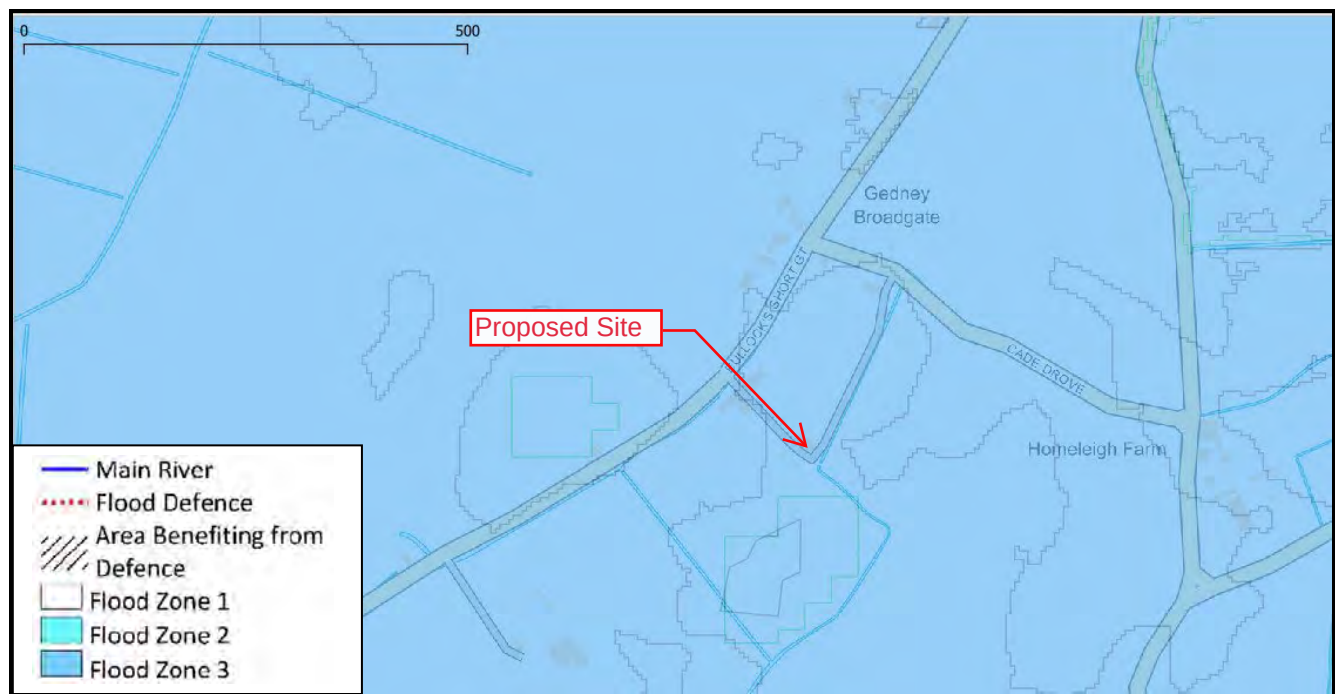
The Environment Agency has permissive powers for reducing the risk of flooding from designated main rivers and from the sea.

The following potential sources of flooding affecting the development site have been identified as:

- The Wash(Tidal)
- River Nene (Tidal)
- South Holland IDB Drains (Fluvial)

The Flood Zone Map indicates the area at risk of flooding, **assuming no flood defences exist**, for a flood event with a 0.5% chance of occurring in any year for flooding from the sea, or a 1% chance of occurring for fluvial (river) flooding. It also shows the extent of the Extreme Flood Outline which represents the extent of a flood event with a 0.1% chance of occurring in any year, or the highest recorded historic extent if greater. In some locations, there are many kilometres of raised flood defences. To meet the requirements of the National Planning Policy Framework, these defences are removed in their entirety to produce the Flood Map for Planning (Rivers and Sea). The map therefore shows the full extent of areas that would be at risk of flooding if no defences existed, and water could spread out across the floodplain.

Flood Zones



Flood Map for Planning (Source EA)

These maps show that the site is considered at risk from tidal flooding as it is all located within an area zoned as Flood Zone 3a. The maps indicate that the area would be flooded without flood defences, which are in place, (with an annual probability of more than 0.5% i.e., return frequency of less than 1 in 200 years for tidal flooding).

Risk of Flooding from Rivers & Sea

The Risk of Flooding from Rivers and Sea Map shows that the site is at a Low risk of flooding. Low means that each year, this area has a chance of flooding of between 1 in 1000 (0.1%) and 1 in 100 (1.0%). This takes into account the effect of any flood defences that may be in this area. Flood defences reduce, but do not completely stop the chance of flooding as they can be overtopped or fail.



Risk of Flooding from Rivers & Sea Map (Source EA)

Fluvial Flood Risk

The site is not considered to be at risk from any Main River.

Tidal Flood Risk

The tidal Wash/ River Nene are therefore the main risk for flooding of the site.

Schemes in the Area

There are no ongoing capital projects to reduce or sustain the current flood risk to this site.

The Wash Defences

The Wash is located some 11.6Km north east of the site, and the flood defences along the edge of the Wash, protecting this site, consist of earth embankments which are supplemented by saltmarsh. They are in good to fair condition and reduce the risk of flooding (at the defence) to a 0.67% (1 in 150) chance of occurring in any year.

River Nene Defences

The River Nene is located some 8.5Km east of the site, and the flood defences along the edge of the river protecting this site, consist of earth embankments. They are in fair condition and reduce the risk of flooding (at the defence) to a 0.67% (1 in 150) chance of occurring in any year.

The Environment Agency inspect these defences routinely to ensure potential defects are identified.

Breach Analysis to Wash Tidal Defences

The base date for the data is 2017 for the East Coast and Wash: Immingham to the West Lighthouse Peak tide levels. The base date for the data is 2017 for the still water levels, the Peak tide levels Present Day (2017) at West lighthouse for the 50% confidence bound 0.1% (1 in 1000year) is 6.14mODN. With climate change from Table 3 (2017 – 2124) 1089mm = 7.13mODN **Map 1**

Taking the precautionary approach, the Hazard Rating following a breach which in Flood Risk Assessment (FD 2320) Guidance for New Development Phase 2 R& D Technical Report these are classified as low <0.75, moderate 0.75-1.25, significant 1.25-2.50 and extreme >2.50 based upon an empirical measure of velocity and depth.

Flood Hazard			Description
	<0.75	Low	Caution – Flood Zone with shallow flowing water or deep standing water.
	0.75 – 1.25	Moderate	Danger for Some - (i.e. children) Danger Flood Zone with deep or fast flowing water.
	1.25 – 2.0	Significant	Danger for Most – Danger Flood Zone with deep fast flowing water.
	>2.0	Extreme	Danger for All – Extreme Danger Flood Zone with deep fast flowing water.

$$HR = d \times (v + 0.5) + DF$$

Where V = Flood flow velocity (m/sec) D = Flood depth (m)

DF = A debris factor included to represent the greater damage, or risk of injury to people, that can occur if debris is swept along with the water. = 0.5 for depths <0.25 or 1.0 for depths

For the degree of Flood Hazard to be classified as low HR must be <0.75.

The Environment Agency has carried out a Tidal Hazard Mapping for the East Coast following a breach to the defences. Following a breach to the defences, the Lincolnshire & Northampton shire Area the Environment Agency has confirmed that for scenario year 2006 annual chance 1 in 1000-year the site is not affected by any event.

Map 2

With climate change up to year 2115 the maps show that for Scenario annual chance 1 in 1000-year that the site is within a Hazard rating area Less than 0.75 (Low Hazard), depth of flow 0 – 0.25m and velocity 0 – 0.3m/sec.

Map 3

Tidal Hazard Mapping - Overtopping

The site is not affected by overtopping of the defences for the present day (2006) and climate change (2115) scenarios.

Floor Levels

Requirements for FFL for More Vulnerable uses: The minimum mitigation measures required for developments that do not have ground floor sleeping shall be determined by the flood depths arising from the 2115 0.1% breach scenario. The finished floor Level FFL of any new dwellings shall be informed by the flood depths.

The proposal for residential use "More Vulnerable" use falls Cell F8 of the South East Lincolnshire Standing Advice Matrix Flood Risk Mitigation Policy to ensure 'safe' development. requirements for FFL states:

- Depths of 0. – 0.25m FFL to be set 300mm above the existing ground level, with flood resilient construction incorporated to a minimum height of 300mm above the predicted flood level.

It is proposed that the minimum ground floor level for the proposed two storey dwellings be raised 300mm above the surrounding ground level (2.90mODN) set at a level of 3.20mODN and the flood resilient measures stated in this report are incorporated into the development. This is the same level as per the approved part Q application.

FLOODING FROM OTHER SOURCES

Flooding is a natural process and can happen at any time from sources other than watercourses and the sea.

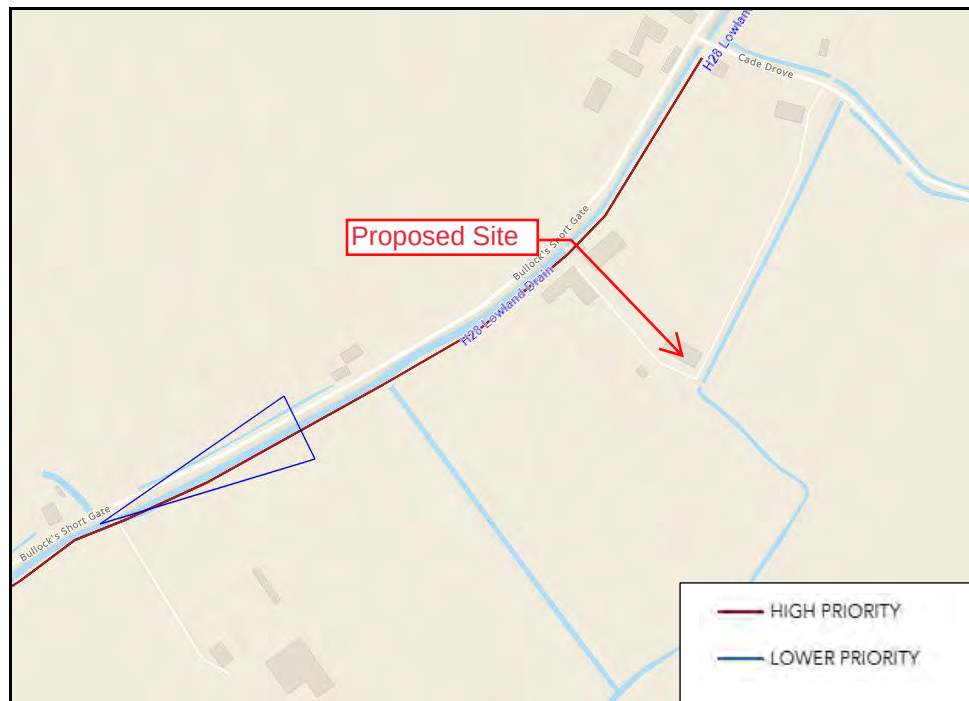
- Flooding from land can occur from intense rainfall, often over short duration of time that is unable to soak into the ground or enter the drainage system. However, with the natural topographic nature of the ground being flat, with no high ground around the site and the floor level being raised 300mm above the existing ground level, this will not cause any rapid inundation of the site and is likely only lead to local ponding of shallow depth and low velocity. It is concluded that flooding from this source is limited to minor isolated cases and is not of strategic significance as regards to flood risk.
- Groundwater flooding occurs when groundwater levels increase sufficiently for the water table to intersect the ground surface. Groundwater flooding can occur in a variety of geological settings including valleys, in areas underlain by chalk, and in river valleys with thick deposits of alluvium and river gravels. The area is not known to suffer from any groundwater problems.
- Flooding from sewers can occur from overloading from heavy rainfall caused by blockages or having inadequate capacity. There are no public sewers in the vicinity of the site.
- Non-natural or artificial sources of flooding such as reservoirs, lakes, or canals where water is stored

above natural ground level could cause flooding if the structure fails or is over topped. There are no known sources within the vicinity of the site.

South Holland Internal Drainage Board

The proposed development site is located within the catchment area H (Free Discharge) of South Holland Internal Drainage Board.

The Board are therefore responsible to operate and maintain the arterial fluvial system. The Board's nearest maintained drain is Drain H28 (Lowland Drain) which is alongside Bullock's Short Gate.



South Holland Internal Drainage Board Drainage Map

The Board's prior written consent will be required for any of the following works:

- No person without the previous consent of the Board shall erect any building or structure, whether temporary or permanent, or plant any tree, shrub, willow or other similar growth within 9 metres of the landward toe of the bank where there is an embankment or wall or within 9 metres of the top of the batter where there is no embankment or wall, or where the watercourse is enclosed within 9 metres of the enclosing structure.
- No person shall, without the previous consent of the Board, for any purpose, by means of any channel, siphon, pipeline or sluice or by any other means whatsoever, introduce any water into the District or, whether directly or indirectly, increase the flow or volume of water in any watercourse in the District.
- The erection or alteration of any mill dam, weir or other like obstruction to the flow, or erection or alteration of any culvert within the channel of a riparian watercourse.

SURFACE WATER FLOODING

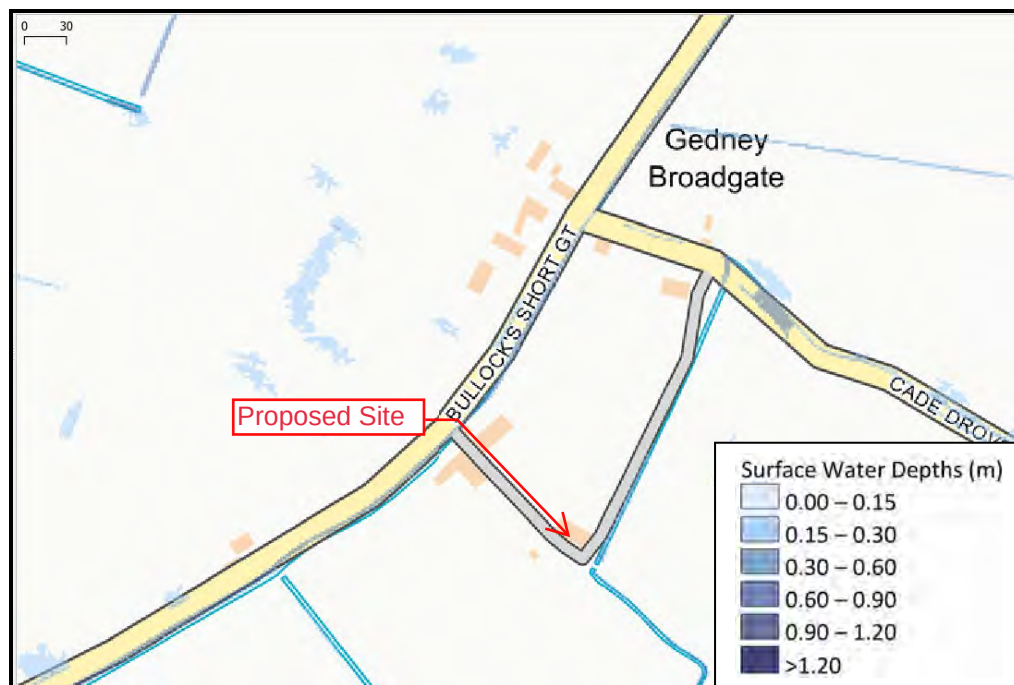
The site for the proposed change of use is shown on the Low-Risk scenario Surface Water flood maps, for the 1 in 1000-year event, not to be affected from surface water flooding.

The maps for surface water and revised maps for river and sea flooding define the risk as High, Medium, Low and Very Low. The chance of flooding for the area defined in any given year is shown below:

- **High:** greater than 1 in 30 (3.3%).
- **Medium:** between 1 in 100 (1%) and 1 in 30 (3.3%).
- **Low:** between 1 in 1000 (0.1%) and 1 in 100 (1%).
- **Very Low:** less than 1 in 1000 (0.1%)

Unlike the fluvial mapping, which is based on a detailed hydraulic model, this mapping is based purely on applying rainfall to a digital terrain model. As such this mapping serves to represent a worst-case scenario which may well overstate the actual probability of flooding in this area.

There is a caveat on the Defra Data website, as to the use of these maps and that they are not to be used to identify that an individual property will flood. Because of the way they have been produced and the fact that they are indicative, these maps are not appropriate to act as the sole evidence for any specific planning or regulatory decision or assessment of risk in relation to flooding at any scale without further supporting studies or evidence.



Risk of Flooding from Surface Water Map (Source EA)

SEQUENTIAL APPROACH

When applying the sequential approach for flood risk in accordance NPPF the site of the development would fall into Flood Zone 3 (High Probability) as the site is shown to be within the tidal/fluvial flood plain as shown on the

Environment Agency's Flood Map without defences in place.

The Environment Agency categorise land into one of three Flood Zones.

- Flood Zone 1 is land outside the 0.1% floodplain (with a chance of flooding of less than 0.1% chance in any given year)
- Flood Zone 2 is land that falls between the 1 in 100-year extent and the 1 in 1000-year extent (a chance of flooding between 1% and 0.1% in any given year)
- Flood Zone 3a is land which falls within the 1 in 100-year flood extent (has a 1% chance of a flood occurring in any given year).

Applying the Flood Risk Vulnerability Classification in Table 2 of NPPG, the proposed residential use is classified as, "More Vulnerable" with Table 1 of NPPG stating that such uses are appropriate in this zone (as summarised in Table 3 NPPG).

Table 3: Flood Risk Vulnerability and Flood Zone 'Compatibility'

Flood Risk Vulnerability Classification		Essential Infrastructure	Water Compatible	Highly Vulnerable	More Vulnerable	Less Vulnerable
Flood Zone	Flood Zone 1	✓	✓	✓	✓	✓
	Flood Zone 2	✓	✓	Exception Test Required	✓	✓
	Flood Zone 3a	Exception Test Required	✓	✗	Exception Test Required	✓
	Flood Zone 3b Functional Floodplain	Exception Test Required	✓	✗	✗	✗

NPPF Guidance Paragraphs 165 - 179 requires development within high areas of flood risk be determined using a sequential risk-based approach to the location of development to avoid where possible flood risk to people and property and manage any residual risk, taking account the impacts of climate change.

The aim of the Sequential Test is to steer new development to areas with the lowest probability of flooding. The NPPF states that development should not be permitted if there are reasonably available sites appropriate for the proposed development in areas with a lower probability of flooding. It is important to note that the Sequential Test does not specifically mean that sites such as this cannot be developed, rather that sites at less risk should be developed first.

Sequential Test

The proposal should be viewed in the light of an established fallback position under Class Q of the GPDO. The prior approval application for the permitted development right allowed for the conversion of the existing agricultural building to form 2 No dwellings. Planning Ref. H06-0868-23 dated 27th November 2023.

The relevance of and weight to be attached to a fall-back position within the planning balance has been examined by the courts and there is a range of resulting case law that has arisen on this matter. The Court of Appeal decision *Mansell v Tonbridge and Malling Borough Council*, issued on the 8th September 2017, is very appropriate. At paragraph 27 (3) of this judgement, the judge identifies the following principle when assessing the weight to be applied to a fall-back position:

‘Therefore, when the court is considering whether a decision-maker has properly identified a “real prospect” of a fall-back development being carried out should planning permission for the proposed development be refused, there is no rule of law that, in every case, the “real prospect” will depend, for example, on the site having been allocated for the alternative development in the development plan or planning permission having been granted for that development, or on there being a firm design for the alternative scheme, or on the landowner or developer having said precisely how he would make use of any permitted development rights available to him under the GPDO. In some cases that degree of clarity and commitment may be necessary; in others, not. This will always be a matter for the decision-maker’s planning judgment in the particular circumstances of the case in hand.

It is considered that the proposed development of two new-build dwellings passes the sequential test given there is a fallback position because of the prior approval which has previously been granted for the conversion of the existing agricultural building to two dwellings.

Exception Test

This Flood Risk Assessment considers the flood protection measures, which clearly demonstrate how the development will manage the flood risk on the site sufficiently and in accordance with the standing advice from the Environment Agency. These measures ensure that the development will be safe for its lifetime, without increasing the flood risk elsewhere. This, in addition, to the fallback position of the prior approval application previously being granted for the conversion of the agricultural building into two dwellings together with the scheme having some community benefits, including providing residential accommodation, generating employment during the construction period and supporting local services and facilities. Therefore, it is considered the development passes both parts of the Exception Test.

The flood risk assessment demonstrates that the development will be safe for its lifetime and it will not increase flood risk elsewhere.

Based on the above the development passes both the Sequential Test and Exception Test and is therefore suitable for the proposed location.

The proposal is therefore acceptable in respect of flood risk related matters and is in accordance with Policy 4 of the Local Plan.

DRAINAGE STATEMENT

Surface Water Drainage

Applications for developments where the proposals will result in the increase the amount of surface water run-off require that an appropriate drainage strategy to be undertaken to ensure that the surface water discharge mimics the existing pre-development regime.

Any proposed surface water drainage system will need to be designed to account for the effects of climate change over the lifetime of the development. Based on the recommendations the proposed drainage systems should be sized for the critical 1 in 100-year storm event and to allow for a 40% increase in rainfall intensity for climate change.

In accordance with recognised guidance, Part H of the Building Regulations 2010 and National Planning Policy Framework, there is a hierarchy of where surface water should discharge. This hierarchy should be followed where practicable, and is as follows:

- 1) Infiltration
- 2) Watercourse
- 3) Public sewer

Infiltration

- a) Domestic curtilage roof area – it is proposed to discharge this to underground pipes, where required, with silt traps incorporated prior to connecting to cellular crate soakaways designed in accordance with BRE 365. A water butt of at least 220L internal capacity shall be installed to intercept rainwater draining from the roof of each building, to reduce the risk of flooding and demand for water by recycling and to increase the level of sustainability of the development.
- b) The access and parking areas will be constructed using permeable materials to allow percolation into the ground as naturally occurs.

Foul Drainage

There are no public foul sewers serving the area therefore foul drainage from the proposed dwellings will be connected in underground pipes in accordance with Doc. H of the Building Regulations and connected into a package treatment plant. An application will be made to South Holland IDB under Byelaw 3, to discharge the final effluent into a nearby watercourse when planning permission is granted..

As there is a positive drainage system capable of receiving flows from the development there is no likely impact on neighbouring property.

CLIMATE CHANGE

Global warming is now recognised that it is likely to affect the frequency and severity of extreme events for both tidal and fluvial flooding. The Climate change allowances in the NPPF Guidance was updated on the 20th of July 2021.

Peak River Flow Allowances

For flood risk assessments use the Management Catchment Climate Changes for the peak river flow map. Management catchments are sub-catchments of River Basin Districts.

The site is located within the Nene Management Catchment within the Anglian River Basin District, for sites within Flood Zone 2 or 3a and for “More Vulnerable” land uses, the Central allowances figures, in the Table below, should be used.

Peak River flow allowances within the Management Catchment Allowances				
River Basin District /Management Catchment	Allowance category	Total potential change anticipated for '2020s'. (2015 to2039)	Total potential change anticipated for '2050s'. (2040 to2069)	Total potential change anticipated for '2080s'. (2070 to2115)
Anglian/ Nene	Upper End	18%	13%	36%
	Higher Central	4%	0%	17%
	Central	-2%	-7%	4%

The effect of global warming on peak rainfall allowances is given in Table 1.

Table 1 Peak Rainfall Intensity

Table 1 Peak rainfall intensity allowance in small and urban catchments (1961 to1990 baseline)			
Applies across all of England	Total potential change anticipated for 2010 to 2039	Total potential change anticipated for 2040 to 2059	Total potential change anticipated for 2060 to 2115
Upper End	10%	20%	40%
Central	5%	10%	20%

The annual sea rise due to climate change is given in NPPF and the recommended contingency allowances are stated in Table 2.

Table 2 Peak Sea Level Rise

Table 2 Peak Sea level allowance for each epoch in (mm) per year with cumulative sea level rise for each epoch in brackets (use 1981to 2000 baseline)						
Area of England) (Use River Basin	Allowance	2000 to 2035	2036 to 2065	2066 to 2095	2096 to 2125	Cumulative Rise 2000 to 2125 (m)
Anglian	Higher Central	5.8 (203mm)	8.7 (261mm)	11.6 (348mm)	13 (390mm)	1.20m
Anglian	Upper End	7 (245mm)	11.3 (339mm)	15.8 (474mm)	18.1 (543mm)	1.6m

FLOOD PROTECTION

Any impact of damage to the properties can be foreseen and mitigated against by relatively simple design and construction techniques. There are two forms of flood protection works: -

- **Flood-resistance or proofing works:** - these try to reduce the amount of water entering a building.

- **Flood-resilient works:** - these reduce the amount of damage caused by water entering the building.

The proposed dwellings will have the following resilient measures incorporated in the construction in accordance with "Improving the flood performance of new buildings" CLG (2007).

- o New electrical services: electrical sockets, heating systems: boiler units and ancillary devices should be installed at least 500mm above the ground floor level to minimise damage to electrical services. New electric ring mains should be installed at high level with drops to ground floor sockets and switches.
- o The ground floor for the building is to be raised 300mm above the existing ground level set at 3.20mODN.
- o Avoid the use of mineral fibre insulation for any new ground floor (walls & floor) and use a rigid closed cell material as these retain integrity and have low moisture take-up.
- o Where possible, all service entries should be sealed (e.g., with expanding foam or similar closed cell material). Closed cell insulation should be used for pipes which are below the predicted flood level.
- o As this site is in an area that is capable of receiving flood warnings from the Environment Agency Floodline Warning Direct system. It is recommended that the property Owner/tenant of the ground floor units contact the Environment Agency's Floodline on 0345 988 1188 to register the property to receive advance warning of flooding by telephone, mobile, fax, SMS text, email or pager. The Environment Agency aim to issue a 'severe flood warning' approximately 2 hours before existing defences are overtopped.

CONCLUSION

- o The site does have the protection of flood defences which are well maintained by the Environment Agency.
- o The site is shown to be within Flood Zone 3 'High Probability' as detailed on the Environment Agency's Flood Zone Maps without defences. The Environment Agency Flood Map identifies the site as being in Flood Zone 3 with a high probability of flooding. 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 is also at no risk of surface water flooding (annual probability less than 0.1%); the site is not within a risk of reservoir flooding.
- o The ground floor for the building is to be raised 300mm above the existing ground level set at 3.20mODN.
- o The maps from the Lincolnshire & Northamptonshire Area Tidal Breach Hazard Maps, for scenario year

present day, for the 1 in 1000-year event, shows that the site is not within a Hazard rating area. With climate change 2115, for the 1 in 1000-year event, the site is within a Hazard rating area less than 0.75 (Low Hazard), with a maximum predicated depth of flow 0 – 0.25m and velocity of flow 0 – 0.3m/sec..

- o Any impact of damage to the property can be foreseen and mitigated against by relatively simple design and construction techniques. They will be constructed using materials which are flood resilient construction as outlined in the report.
- o Flooding from other sources is unlikely to affect the site.
- o No obvious constraints have been identified that may impact the proposed development and the type of mitigation measures that can be used to reduce the flood risk, there is no increase in the flood risk to others.
- o It is therefore concluded that the proposed development can be constructed, safely and sustainably, to meet the requirements of NPPF and the policies of South Holland District Council.

East Coast and Wash - 2018 Coastal Flood Boundary [CFB] Dataset

Key Node Points

Map 1



Scale 1:550,000



▲ East Coast and Wash

See separate data sheet for predicted flood levels

Created by the Partnerships and Strategic Overview Team, Lincoln

East Coast and Wash: Immingham to the West Lighthouse

2018 Coastal Flood Boundary Extreme Sea Levels

CFB REF	LOCATION	EASTING	NORTHING	ANNUAL CHANCE (1 IN X) OF TIDE LEVEL IN METRES ODN																						
				1			10			50			100			200			300			1000				
				Confidence Bound			Confidence Bound			Confidence Bound			Confidence Bound			Confidence Bound			Confidence Bound			Confidence Bound				
				2.5%	50%	97.5%	2.5%	50%	97.5%	2.5%	50%	97.5%	2.5%	50%	97.5%	2.5%	50%	97.5%	2.5%	50%	97.5%	2.5%	50%	97.5%		
3888	Immingham	520440	417625	4.16	4.17	4.19	4.50	4.53	4.62	4.73	4.80	5.00	4.83	4.93	5.19	4.93	5.06	5.41	4.98	5.14	5.55	5.15	5.38	6.01		
3890	Haborough Marsh	522100	416512	4.14	4.15	4.17	4.48	4.51	4.60	4.70	4.77	4.97	4.80	4.90	5.16	4.90	5.03	5.38	4.94	5.10	5.51	5.11	5.34	5.97		
3898	Grimsby	529295	413162	3.98	3.99	4.01	4.31	4.34	4.43	4.53	4.60	4.80	4.61	4.71	4.97	4.71	4.84	5.19	4.74	4.90	5.31	4.88	5.11	5.74		
3906	Buck Beck	534709	407369	3.87	3.88	3.90	4.19	4.23	4.31	4.41	4.50	4.68	4.50	4.61	4.86	4.61	4.75	5.10	4.64	4.82	5.22	4.80	5.05	5.66		
3910	Tetney	538035	405537	3.85	3.86	3.89	4.17	4.22	4.30	4.40	4.50	4.67	4.49	4.61	4.86	4.60	4.75	5.10	4.63	4.82	5.21	4.80	5.06	5.66		
3918	Donna Nook	544641	401997	3.82	3.83	3.86	4.14	4.19	4.27	4.38	4.48	4.65	4.47	4.60	4.85	4.58	4.74	5.10	4.63	4.82	5.22	4.81	5.08	5.68		
3928	Saltfleet	549131	393360	3.78	3.79	3.82	4.11	4.16	4.26	4.36	4.46	4.64	4.47	4.59	4.86	4.57	4.74	5.11	4.63	4.83	5.25	4.83	5.11	5.74		
3942	Boygrift	555131	380860	3.72	3.74	3.77	4.06	4.11	4.22	4.33	4.43	4.65	4.43	4.57	4.87	4.56	4.73	5.13	4.62	4.83	5.28	4.85	5.15	5.82		
3968	Gibraltar Point	557652	356181	4.16	4.17	4.20	4.51	4.56	4.67	4.76	4.85	5.08	4.85	4.97	5.27	4.94	5.10	5.49	4.99	5.18	5.63	5.14	5.41	6.09		
3992_14	Hobhole	535990	340116	4.96	4.97	5.01	5.40	5.44	5.56	5.66	5.76	5.98	5.78	5.90	6.20	5.88	6.04	6.44	5.92	6.11	6.57	6.03	6.31	6.99		
	Grand Sluice*	532366	344510	4.93	4.94	4.98	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3			
3992_9	Boston Barrier	532754	342852	4.93	4.94	4.98	5.41	5.45	5.57	5.73	5.83	6.05	5.85	5.97	6.27	5.93	6.09	6.49	5.94	6.13	6.59	5.98	6.26	6.94		
3992_5	Fosdyke Bridge	531886	332234	4.87	4.88	4.92	5.31	5.35	5.47	5.58	5.68	5.90	5.71	5.83	6.13	5.82	5.98	6.38	5.87	6.06	6.52	6.01	6.29	6.97		
4008	West Lighthouse	550094	329971	4.87	4.88	4.91	5.21	5.26	5.37	5.46	5.56	5.78	5.56	5.68	5.98	5.66	5.82	6.21	5.71	5.90	6.35	5.86	6.14	6.81		
-	Marsh Road	525988	324065	-	5.04	-	-	5.44	-	-	5.73	-	-	5.85	-	-	5.98	-	-	-	-	-	-	-		
-	Wisbech	546110	309940	-	4.83	-	-	5.25	-	-	5.53	-	-	5.66	-	-	5.78	-	-	-	-	-	-	-		
-	Dog-in-a-Doublet	527200	299287	-	3.67	-	-	4.00	-	-	4.22	-	-	4.32	-	-	4.42	-	-	-	-	-	-	-		

See next page for notes

2018 Coastal Flood Boundary Extreme Sea Levels

NOTES:

The following notes apply to all CFB sites (ie all on table excluding Marsh Road, Wisbech, Dog-in-a-Doublet)

- The base date for the data is 2017.
- The levels are still water levels. Depending on the use of the data it may be necessary to consider wave heights and / or joint probability analysis of water level and other variables.
- Levels for other annual chance probabilities are available if required.
- For additional information relating to the 2018 Coastal Flood Boundary Extreme Sea Levels or to access the full dataset for the above sites or intermediate locations refer to the Defra Metadata Catalogue at <https://deframetadata.com/geonetwork/srv/eng/catalog.search#/metadata/84a5c7c0-d465-11e4-b0bd-f0def148f590>

The following notes apply to all Marsh Road, Wisbech, Dog-in-a-Doublet

- The base date for the data is 2006
- The levels are still water levels. Depending on the use of the data it may be necessary to consider wave heights and / or joint probability analysis of water level and other variables.
- Levels for other annual chance probabilities are available if required.
- These levels will be updated as their respective tidal river models are updated.

The following notes apply to Grand Sluice

- The data is based on CFB 2018 data for Boston Barrier site, capped at 5.3mAOD to reflect use of the barrier.
- The base date for the data is 2017
- The levels are still water levels. Depending on the use of the data it may be necessary to consider wave heights and / or joint probability analysis of water level and other variables.
- For additional information relating to the 2018 Coastal Flood Boundary Extreme Sea Levels or to access the full dataset for the above sites or intermediate locations refer to the Defra Metadata Catalogue at <https://deframetadata.com/geonetwork/srv/eng/catalog.search#/metadata/84a5c7c0-d465-11e4-b0bd-f0def148f590>

Map 2

Max Hazard

Proposed Site

3m

Max Depth

0 10 20 30 40 50 60 70 80 90 100

Gedney Broadgate

Proposed Site

Polverton Farm

Moorwood Cottage

Moorwood Farm

Farm House Farm

Track

Drain

Field

Wood

Water

Track (100m)

Track (200m)

Track (300m)

Track (400m)

Track (500m)

Track (600m)

Track (700m)

Track (800m)

Track (900m)

Track (1000m)

Track (1100m)

Track (1200m)

Track (1300m)

Track (1400m)

Track (1500m)

Track (1600m)

Track (1700m)

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Track (3000m)

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Track (3800m)

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Track (4000m)

Track (4100m)

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Track (5000m)

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Track (9000m)

Track (9100m)

Track (9200m)

Track (9300m)

Track (9400m)

Track (9500m)

Track (9600m)

Track (9700m)

Track (9800m)

Track (9900m)

Track (10000m)

Max Velocity

The map displays the 'Max Velocity' area, which is highlighted in yellow. A red arrow points to a specific location within this area, labeled 'Proposed Site'. The map includes various geographical features such as roads (e.g., 'BROADGATE', 'HARTFORD ROAD'), tracks, and drains. Other labeled locations include 'Gedney Broadgate', 'Camp Site Laurel Park', 'Fen House Farm', 'Homeleigh Farm', 'Fen Farm', 'Moorswood Cottage', and 'Moorswood Farm'. The map also shows several red crosses and a red L-shaped symbol.

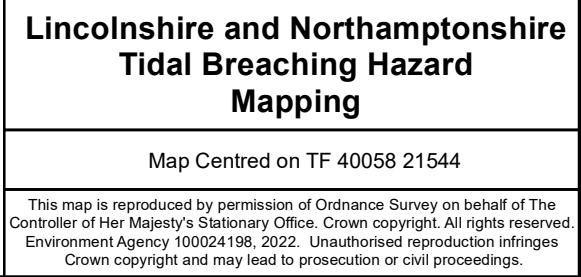
★ Modelled Breach Locations - see also the accompanying plan "Location of Modelled Breaches"							
Max Hazard (Flood Risk to People : FD2320)				Max Depth (m)		Max Velocity (m/s)	
	Less than 0.75 (Low Hazard)				0 - 0.25		0 - 0.3
	Between 0.75 and 1.25 (Danger for Some)				0.25 - 0.50		0.3 - 1.0
	Between 1.25 and 2.0 (Danger for Most)				0.50 - 1.0		1.0 - 1.5
	Greater than 2.0 (Danger for All)				1.0 - 1.6		1.5 - 2.5
					1.6 +		2.5 +
Date Printed	October 2022	Scenario year	2115	Scenario Annual Chance	0.1% (1 in 1000)	CCN Number	CCN-2022-282185

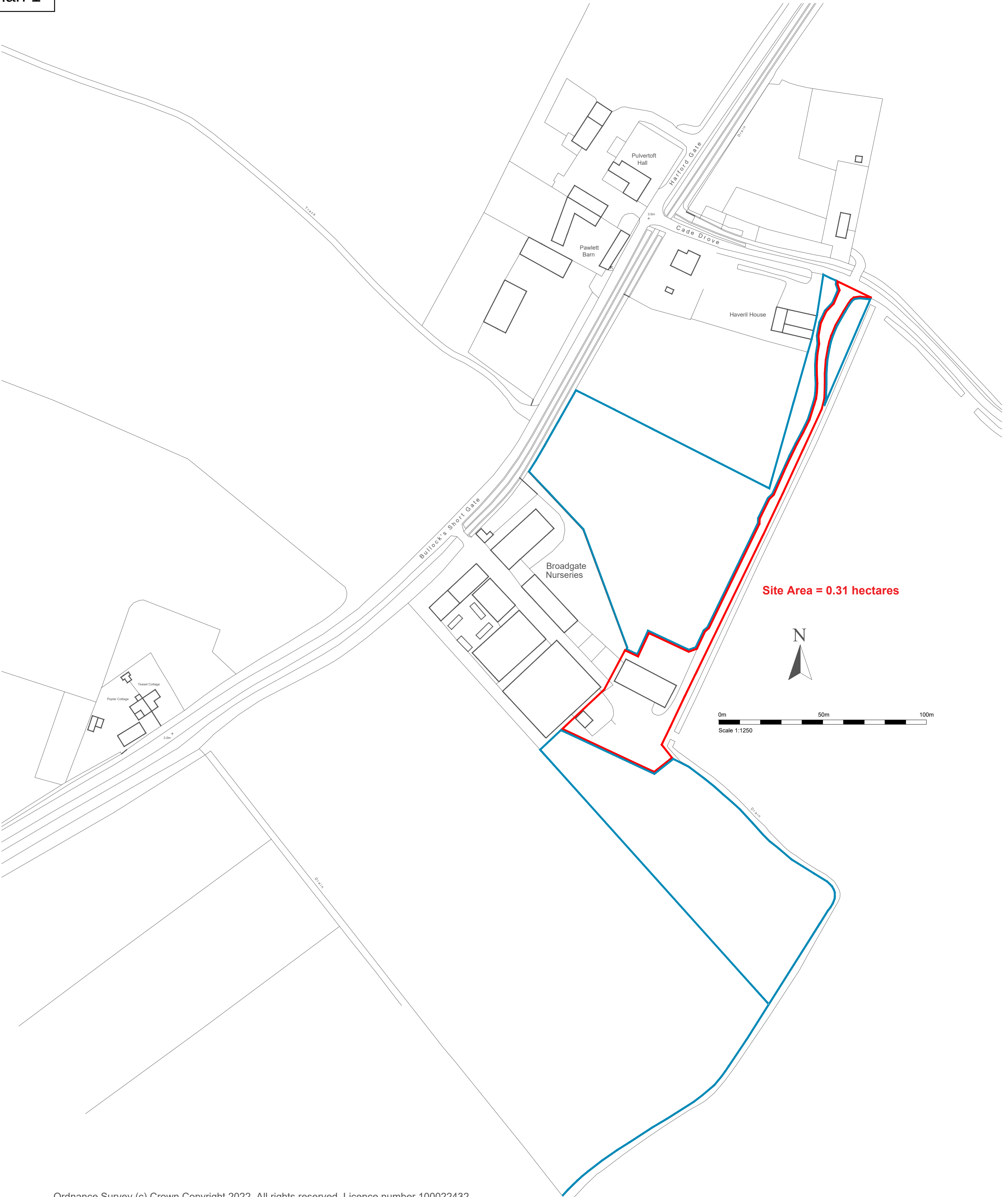
This map shows the level of flood hazard to people (called a hazard rating) if our flood defences are breached at certain locations, for a range of scenarios. The hazard rating depends on the depth and velocity of floodwater, and maximum values of these are also mapped.

The map is based on computer modelling of simulated breaches at specific locations. Each breach has been modelled individually and the results combined to create this map. Multiple breaches, other combinations of breaches, different sized tidal surges or flood flows may all give different results.

The map only considers the consequences of a breach, it does not make any assumption about the likelihood of a breach occurring. The likelihood of a breach occurring will depend on a number of different factors, including the construction and condition of the defences in the area. A breach is less likely where defences are of a good standard, but a risk of breaching remains.

General Enquiries No: 03708 506 506. Weekday Daytime calls cost 5p plus up to 6p per minute from BT Weekend Unlimited. Mobile and other providers' charges may vary





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BROWN & CO JHWalter

Proposed new 2no. dwellinghouses
Broadgate Nurseries, Bullock's Short Gate, Gedney Broadgate

Location Plan	Scale: 1:1250	Revision
	Sheet Size: A2	14/03/2024
	AP043259-2-01	C

Landscaping Enhancements

Lawns & Additional Planting

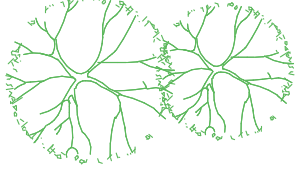
Plants to include night scented flowers to attract moths and night flying insects to provide foraging opportunities for bats. Species to include:

- Evening Primrose - *Oenothera biennis*
- Sweet Rocket - *Hesperis matronalis*
- Honeysuckle - *Lonicera sp.*
- Lavender - *Lavendula sp*
- White Jasmine - *Jasminum officinale*
- Night-scented Catchfly - *Silene noctiflora*
- Night-scented Stock - *Matthiola longipetala*
- Soapwort - *Saponaria officinalis*



Native Species Tree Planting:

- EO - English Oak
- FM - Field Maple - *Acer Campestre*
- RO - Rowan - *Sorbus Aucuparia*
- CA - Crab Apple - *Malus Sylvestris*



- All trees to be acquired from advanced nursery stock.
- Minimum 12-14cm girth container grown heavy standard (unless otherwise stated) at approx. 2.5m to 3.5m high.
- Spacing between trees to be no less than 2.5m.
- Tree pits should be sized to suit the root ball.
- All trees to be supported with min 75mmØ stake driven into the grown vertically and secured with rubber ties at the highest point below the first branch.
- Strimmer guards to be fitted for protection.

Mixed Native Hedge Planting Species:



- Common Hawthorn - *Crataegus monogyna*
- Hazel - *Corylus avellana*
- Field Maple - *Acer Campestre*
- Midland Hawthorn - *Crataegus laevigata*
- Wild Cherry - *Prunus avium*
- Bird Cherry - *Prunus padus*
- Blackthorn - *Prunus spinosa*

- Hedges planted in double rows @ 300mm staggered centres.
- Hedging whips to be minimum 40cm to 60cm high.
- All planting to take place during first available planting season.
- Any failures with the initial 7 years of establishment are to be replaced with same.

Environmental Enhancements

- Dwelling orientated to maximise solar gain
- Air Source Heat Pump heating system with underfloor heatings
- Electric Vehicle Charging Point
- Rainwater Harvesting from the roofs to be used on the garden
- Grey water recycling
- Driveway and parking surfaces to be fully permeable

Indicates approximate location of electric car charging point

Ecological Enhancements



Integral Bat Roost
Location: Built into the south facing elevation at high level, avoiding doors and windows



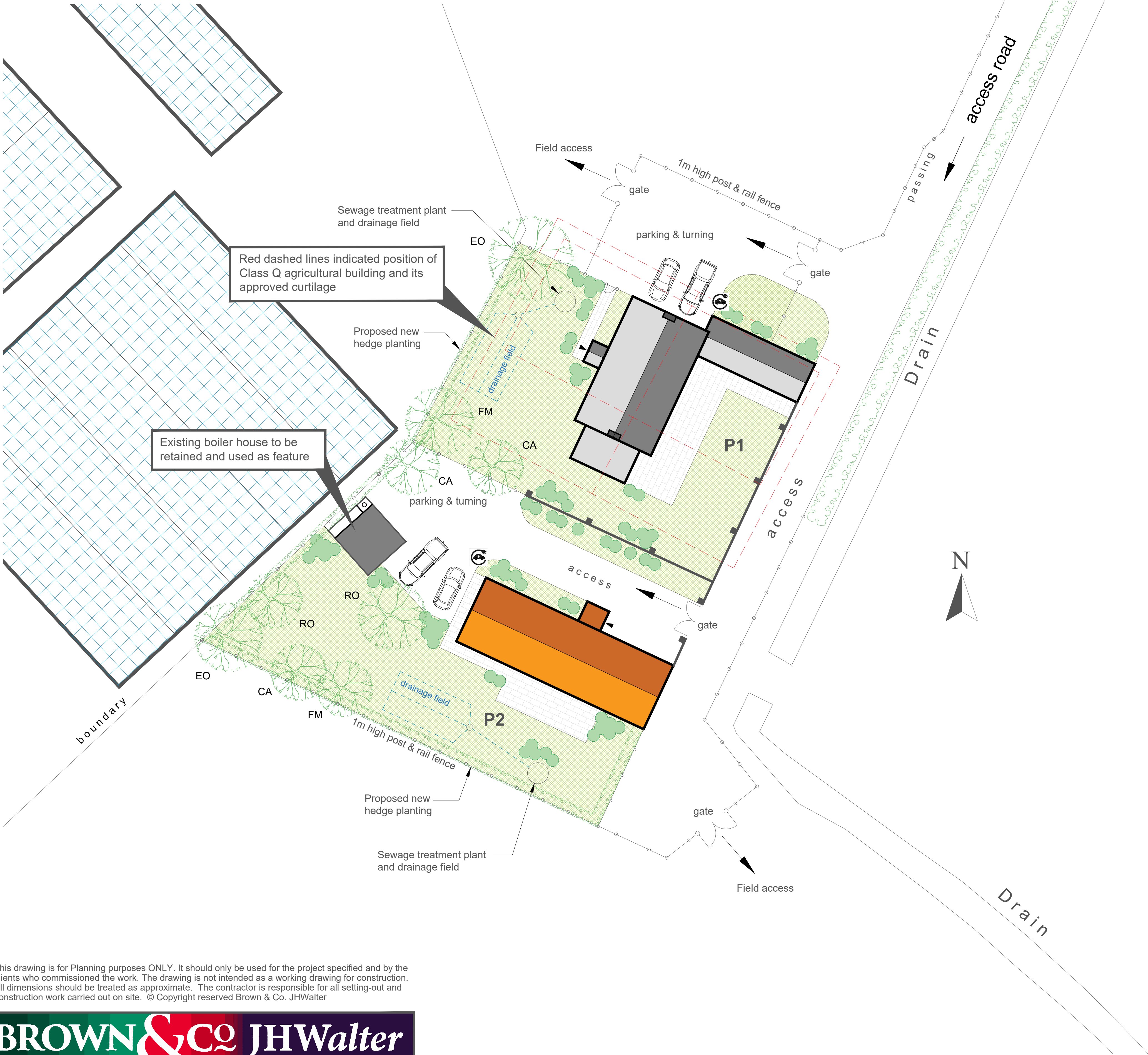
Swift Brick
Location: Ideally North/North East at min/ 5m above ground level



House Sparrow Terrace
Location: Ideally North/North East, under the eaves



Starling Nesting Box
Location: Ideally a shaded, must not be south facing



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BROWN & CO JHWalter

Proposed new 2no. dwellinghouses

Broadgate Nurseries, Bullock's Short Gate, Gedney Broadgate

Proposed Block Plan

Scale: 1:200	Revision
Sheet Size: A1	26/03/2024
AP043259-2-07	B

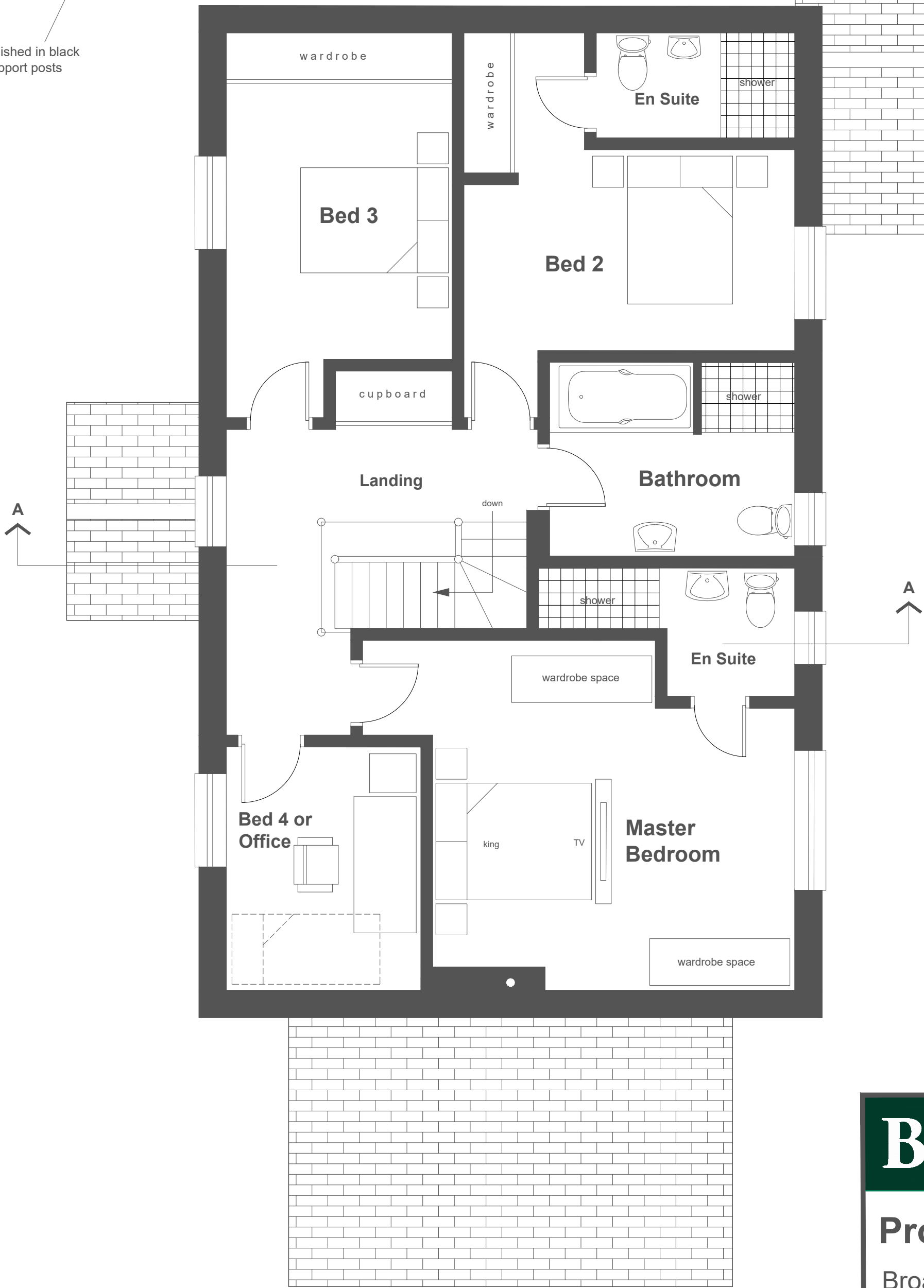
0m 50m
Scale 1:200
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Ground Floor Plan



Gross internal Floor Area = 230sqM or 2476sqft

First Floor Plan



BROWN & CO JH Walter

Proposed Dwellings

Broadgate Nurseries, Bullock's Short Gate, Gedney Broadgate

**Plots 1 Dwellinghouse
Floor Plans**

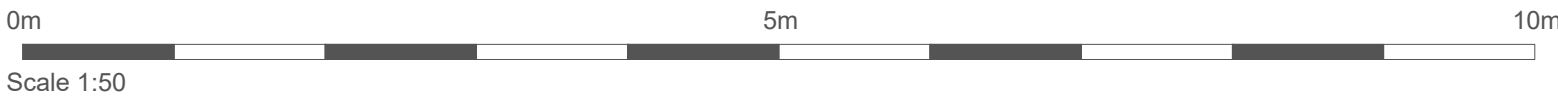
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AP043259-3-P1-05

Revision
26/03/2024

B

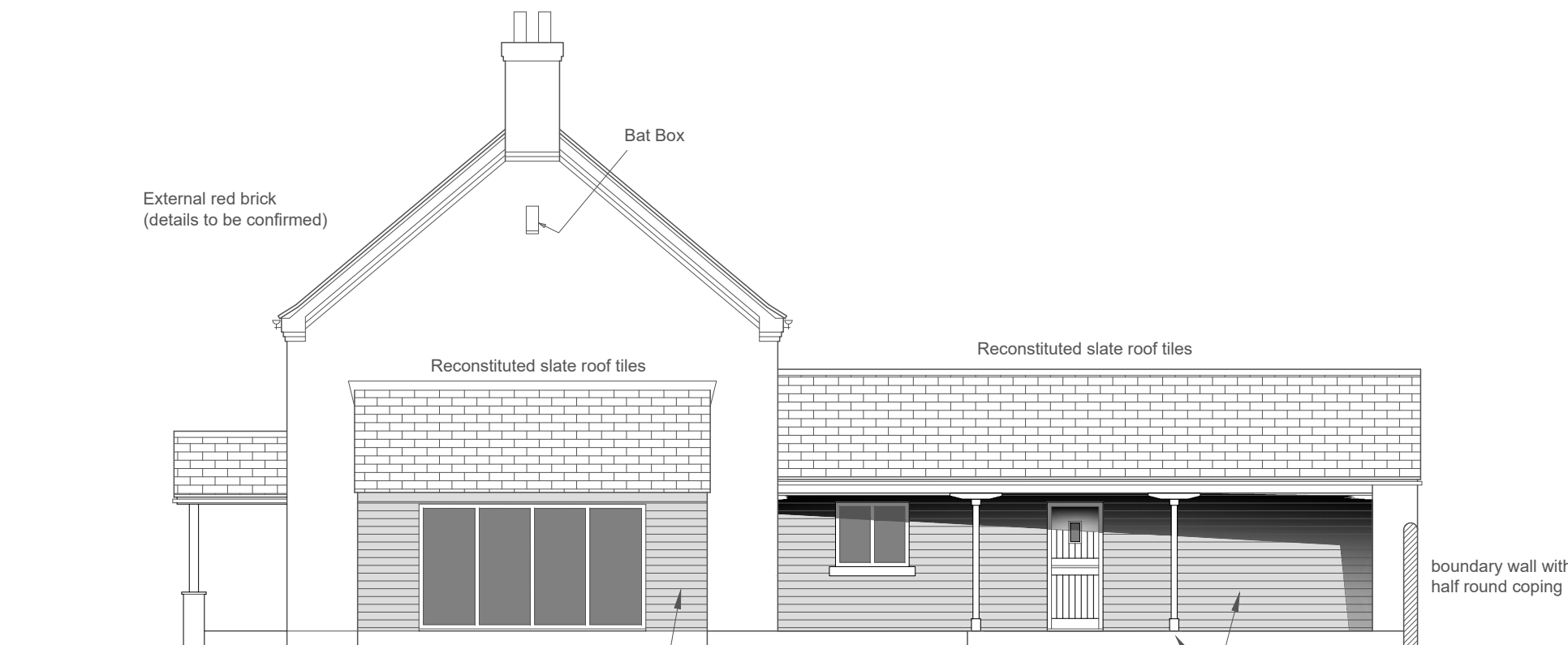




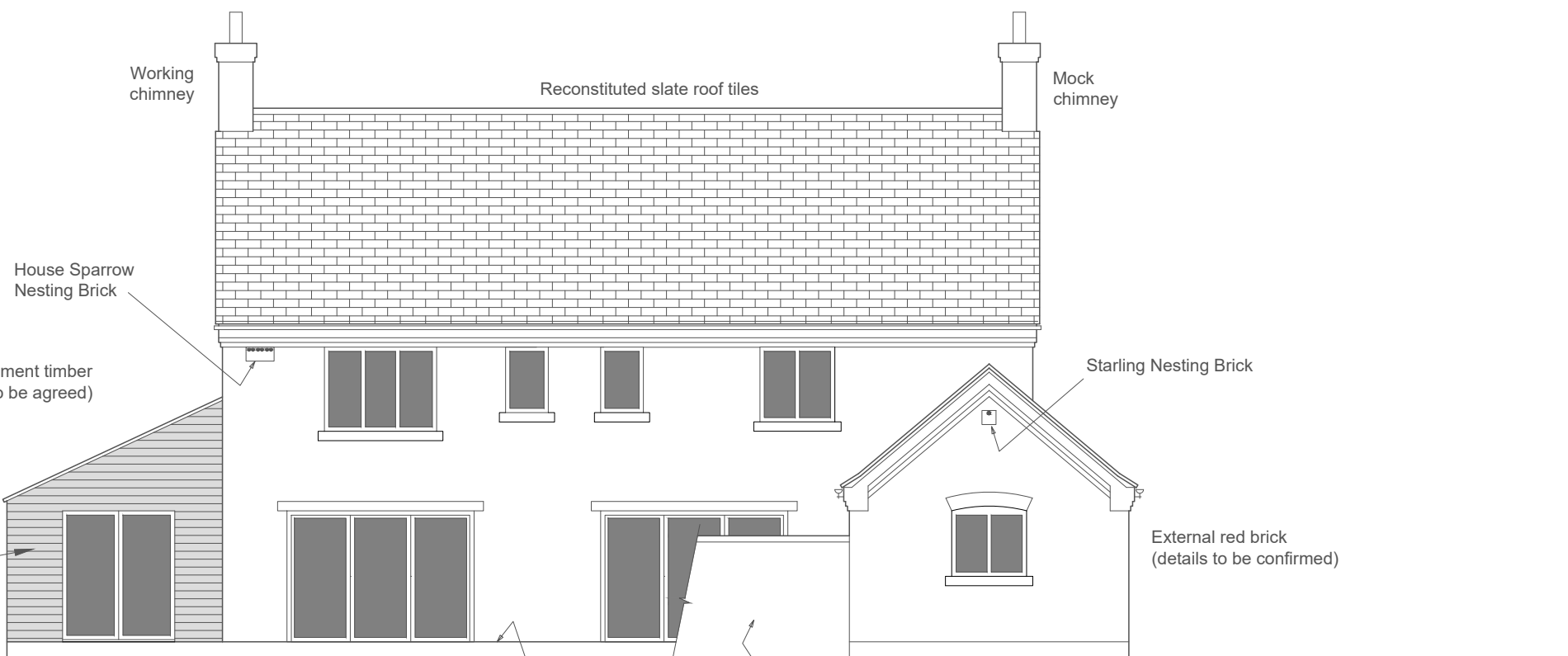
North West Elevation (front)



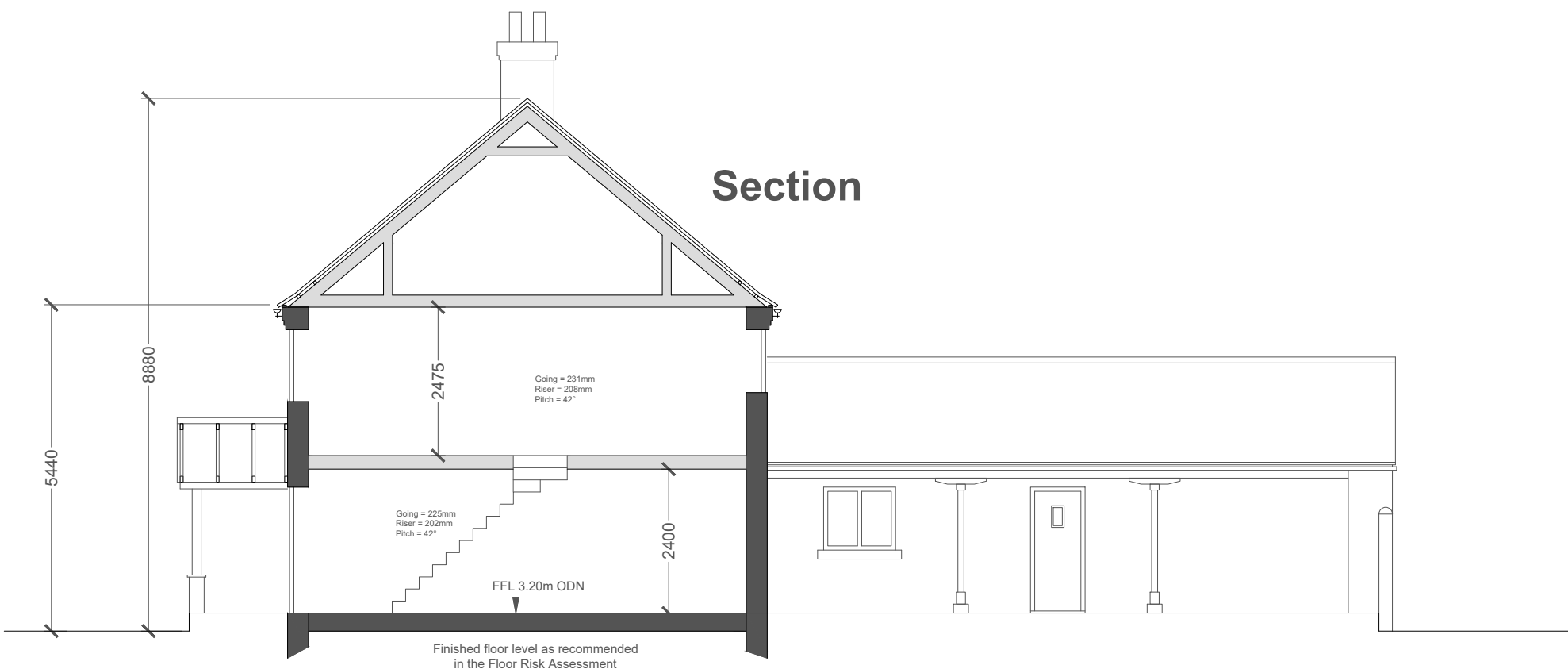
North East Elevation



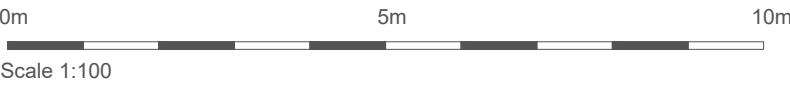
South West Elevation



South East Elevation



Section



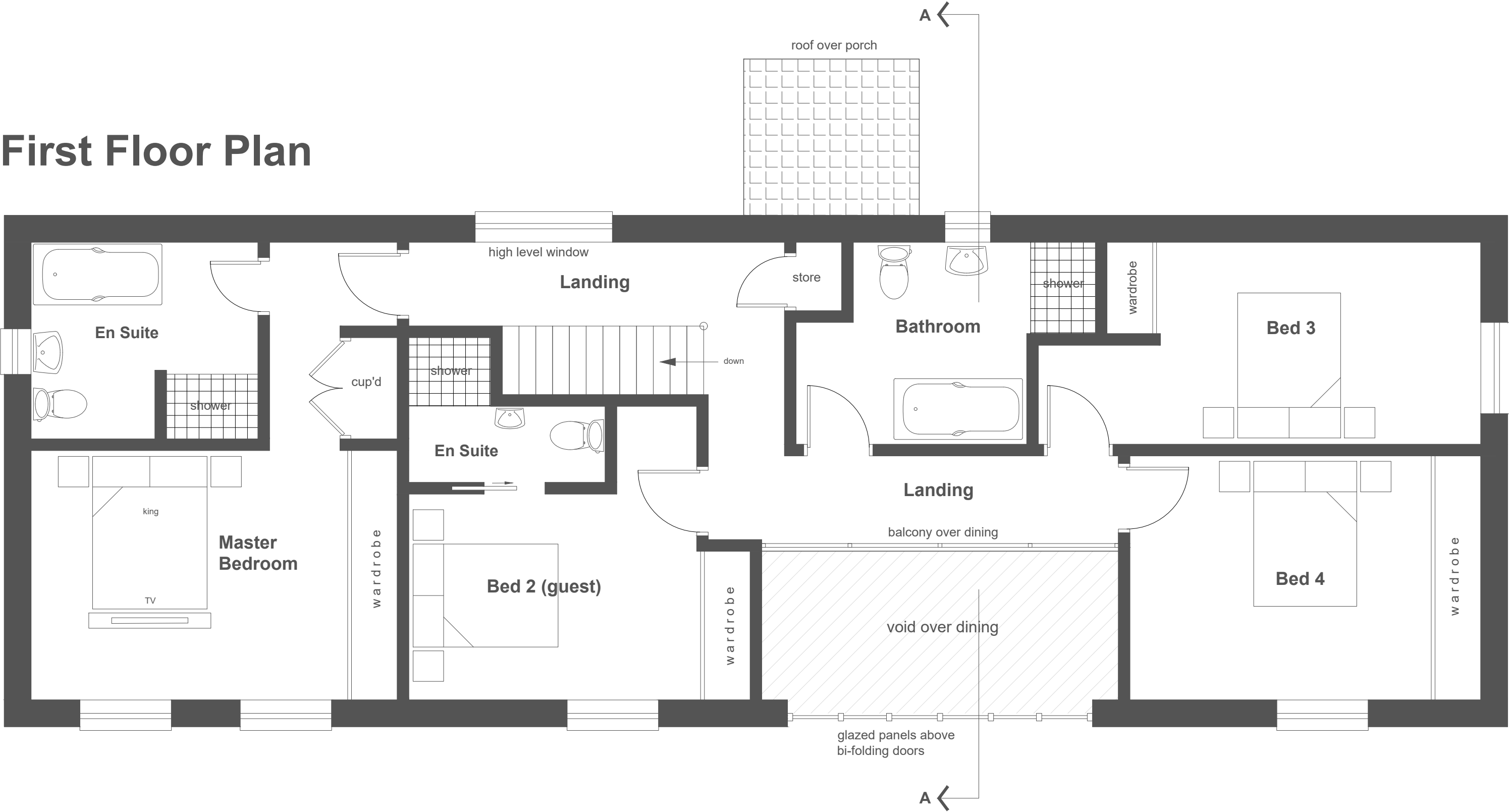
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Proposed Dwellings

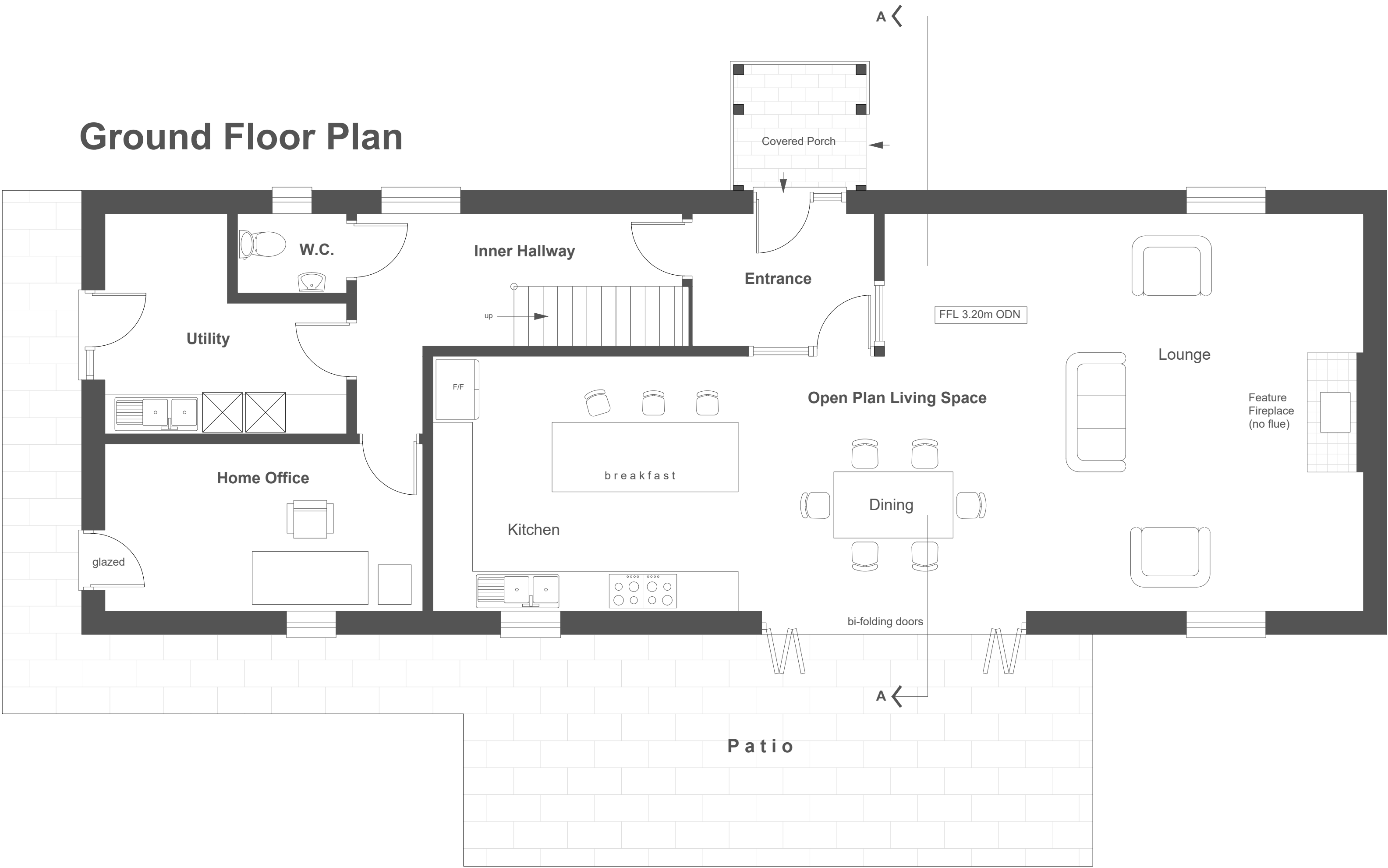
Broadgate Nurseries, Bullock's Short Gate, Gedney Broadgate

Plots 1 Dwellinghouse Elevations & Section	Scale: 1:100	Revision
	Sheet Size: A2	26/03/2024
	AP043259-3-P1-06	B

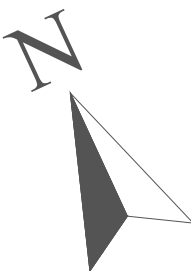
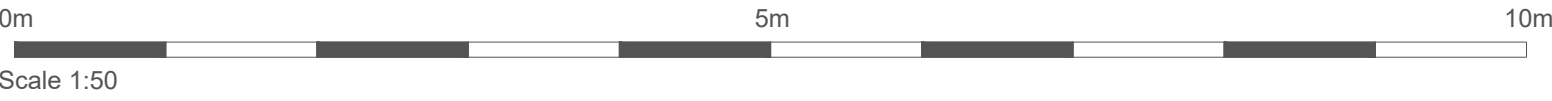
First Floor Plan



Ground Floor Plan



Gross internal Floor Area = 219sqM or 2357sqft



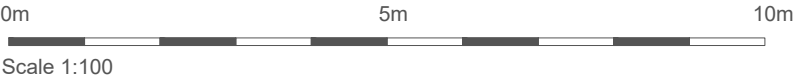
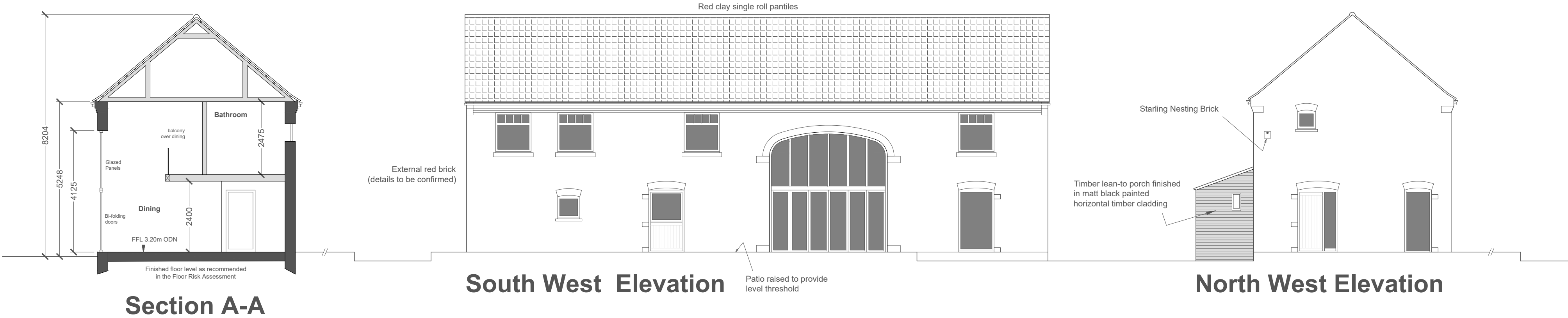
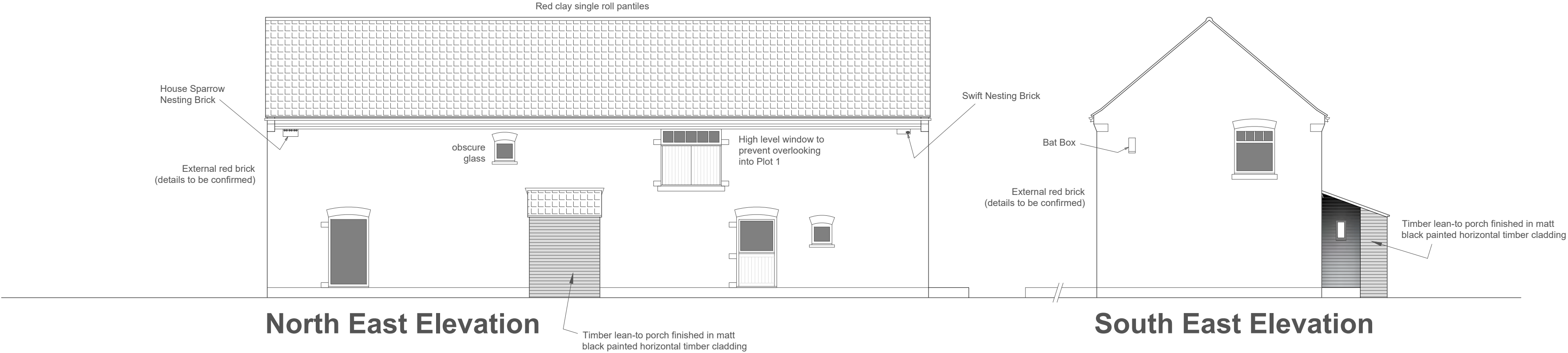
BROWN & CO JH Walter

Proposed Dwellings

Broadgate Nurseries, Bullock's Short Gate, Gedney Broadgate

**Plots 2 Dwellinghouse
Floor Plans**

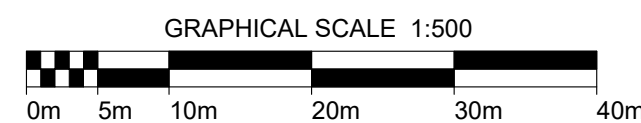
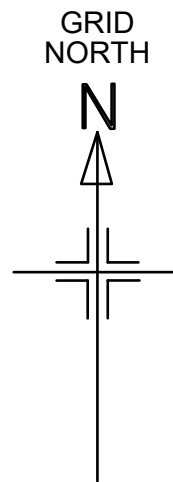
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Sheet Size: A1	
AP043259-3-P2-05	



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Proposed Dwellings
Broadgate Nurseries, Bullock's Short Gate, Gedney Broadgate

Plots 2 Dwellinghouse Elevations & Section	Scale: 1:100	Revision
	Sheet Size: A2	26/03/2024
	AP043259-3-P2-06	B



Station Coordinates to OSGB36 (via OSTN15):				
Name	Easting	Northing	Height	Remark
BASE	540002.603	321528.336	2.963	Temp

Survey Legend:

Bank Top / Bottom	Building
Canopy / Shrub line	Building canopy
Trunk line	Surface changes
Hedge	Well defined
Wall	Poorly defined
Fence	Undefined
Sewer - Foul	Overhead electric
Sewer - Surface	Overhead telephone
Borehole	Survey Station
BO Bollard	GP Gate Post
CT Cable TV	IL Invert Level
CL Cover Level	KO Kerb Offset
EL Electric Cover	LP Lamp Post
EP Electric Post	MH Man Hole
ER Earth Point	MP Marker Post
FFL Floor Level	PO Post
FH Fire Hydrant	RE Rodding Eye
FP Flag Pole	RS Road sign
G Gully	Rwp Rain water pipe
GA Gas Cover	SP Sign Post
	SPL Sign Post Lit
	SV Stop Valve
	Svp Soil Vent Pipe
	TC Telecom Cover
	TL Traffic Light
	TP Telegraph Pole
	UTL Unable to Lift
	VP Vent Pipe
	WM Water Meter
	WO Wash Out

Notes:

- Survey undertaken November 2022.
- All manhole / chamber pipe sizes and inverts are estimations made from surface level only. Pipe inverts shown are outgoing pipe unless otherwise stated.
- Whilst every effort has been made to locate all visible features it should be noted that at the time of survey some items may have been obscured and therefore not located.
- Physical boundary features shown on this survey do not necessarily represent the legal boundaries.
- Levels are orthometric heights relative to Ordnance Datum Newlyn measured by GPS and transformed via OSGM15. Antenna phase centre offsets:
Rinex data = OS supplied, Site data=IGS.
- Survey orientated to Ordnance Survey National Grid. OSGB36 (via OSTN15).
- Transverse Mercator Projection scale factor applied to this survey = 1.0000

Topographical Survey

Broadgate Nurseries
Gedney Broadgate, PE12 0DG

Client : Fletcher Salads

Date : 07.11.22 Scale : 1:500 Size : A1

Project : 2157 Drawing : 001 Rev : -

shire surveys
email : office@shiresurveys.com
website : www.shiresurveys.com