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Flood Risk Assessment and Surface Water Drainage Strategy AEG0931_PE12_South_Holland_07

Site Address: Land at Branches Lane
South Holland
Lincolnshire
PE12 8PD

UK Experts in Flood Modelling, Flood Risk
Assessments, and Surface Water Drainage Strategies

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Document Issue Record

Project: Flood Risk Assessment and Surface Water Drainage Strategy

Prepared for: Dalcour Maclaren Ltd

Reference: AEG0931_PE12_South_Holland_07

Site Location: Land at Branches Lane, South Holland, Lincolnshire, PE12 8PD

Issue	Date	Author	Check	Auth.	Comments
1	23/09/2024	Oliver Manston	DMC	OH	First issue
1.01	28/10/2024	Oliver Manston	-	-	Reissue and updates following release of the latest iteration of the proposed development drawings.
1.02	13/03/2025	Jack Allen	-	-	Reissue following alterations to the shape of the attenuation pond.
1.03	26/03/2025	Jack Allen	-	-	Reissue and updates following release of NaFRA2 mapping.
1.04	27/03/2025	Jack Allen	-	-	Reissue following minor alterations to the attenuation pond shape.

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Table of Contents

Summary	1
1. Introduction.....	3
Site Overview.....	3
Planning Policy and Guidance.....	5
2. Planning Policy.....	6
National Planning Policy Framework (NPPF)	6
Local/Regional Planning Policy	6
Sequential and Exception Tests	11
Summary	13
3. Consultation and Review.....	14
Consultation	14
Documents and Online Mapping.....	14
4. Sources of Flood Risk.....	17
Tidal	17
Fluvial	21
Canals	23
Pluvial	24
Reservoirs.....	28
Groundwater.....	29
Sewers.....	30
5. Flood Risk Mitigation	32
Tidal	32
Other Sources.....	33
Increase to Flood Risk Elsewhere.....	33
6. Surface Water Drainage Strategy.....	34
Ground Conditions	34

Nearby Watercourses.....	34
Existing Drainage Infrastructure	34
Greenfield Runoff Rates.....	35
Climate Change.....	35
InfoDrainage Modelling Criteria	35
Surface Water Drainage Strategy.....	36
InfoDrainage Modelling Results.....	38
Maintenance	39
Designing for Exceedance.....	41
Water Quality	41
Management During Construction	42
7. Conclusions.....	44
Appendix A - Development Proposals.....	46
Appendix B - EA Product Data	47
Appendix C - Surface Water Drainage Strategy Layout	48
Appendix D - InfoDrainage Calculations.....	49

Summary

Development Description	Existing	Proposed
Development Type	Greenfield Ste	Primary Substation
EA Vulnerability Classification	N/A	Essential Infrastructure
Ground Floor Level	The LiDAR data shows the ground elevation of the site vary between approximately 2.34m AOD and 2.80m AOD.	No change, equipment to be raised on plinth
Surface Water Drainage	N/A ¹	See Section 6
Site Size	5005m ² – based on site plans	No change
Risk to Development	Summary	Comment
EA Flood Zone	Flood Zone 3	
Flood Source	Tidal	Affected in Breach and Overtopping Scenarios (2115 Epoch)
SFRA Available	South East Lincolnshire Strategic Flood Risk Assessment (South East Lincolnshire Joint Strategic Planning Committee, 2017)	
Management Measures	Summary	Comment
Ground floor level above extreme flood levels	No – equipment to be raised on plinth	It is recommended that any vulnerable equipment proposed within the site bounds be sited on a raised plinth set at 1.00m above the existing ground levels. An additional raising of 300mm for freeboard allowance is recommended where feasible.
Safe Access/Egress Route	Unmanned substation proposed	The proposals consist of unmanned primary substation and therefore safe access/egress is not required. Any scheduled maintenance when the site will need to be attended

Flood Resilient Design		should be done so whilst no flooding is occurring at the site location.
	Raised vulnerable equipment	It is recommended that any vulnerable equipment proposed within the site bounds be sited on a raised plinth set at 1.00m above the existing ground levels. An additional raising of 300mm for freeboard allowance is recommended where feasible.
	N/A ¹	See Section 6
Site Drainage Plan	N/A ¹	See Section 6
Flood Warning and Evacuation Plan	Yes	Recommended to sign up to the Holbeach, Fleet, Gedney and surrounding areas Environment Agency (EA) flood warning service.
Offsite Impacts	Summary	Comment
Displacement of floodwater	Negligible	It is recommended that the raised plinth be constructed using steel with an open void space beneath the landing, rather than being constructed from a solid concrete slab. The reason for this being to limit the increase in flood risk elsewhere as a consequence of the development.
Increase in surface run-off generation	N/A ¹	See Section 6
Impact on hydraulic performance of channels	LLFA/IDB Consultation Recommended	Given the proximity of the proposed development to the drains bordering the site and considering that an outfall to the ditch network is proposed as a part of the sites drainage strategy - it is recommended that the Internal Drainage Board (IDB) responsible for the site location is consulted on any planning application. The IDB for the site area is the South Holland IDB.

¹ not required for this assessment

² data not available.

1. Introduction

- 1.1. Aegaea were commissioned by Dalcour Maclaren to undertake a Flood Risk Assessment (FRA) and Surface Water Drainage Strategy (SWDS) to facilitate a planning application for the proposed development. This FRA and SWDS has been prepared in accordance with the requirements set out in the National Planning Policy Framework (NPPF) and the associated Planning Practice Guidance.
- 1.2. This FRA and SWDS is intended to support a full planning application and as such the level of detail included is commensurate and subject to the nature of the proposals.

Site Overview

- 1.3. The site of the proposed development is Land at Branches Lane, South Holland, Lincolnshire, PE12 8PD (Figure 1). It is understood that the proposed development is for the siting of a primary substation – a copy of the development proposals can be found in Appendix A.

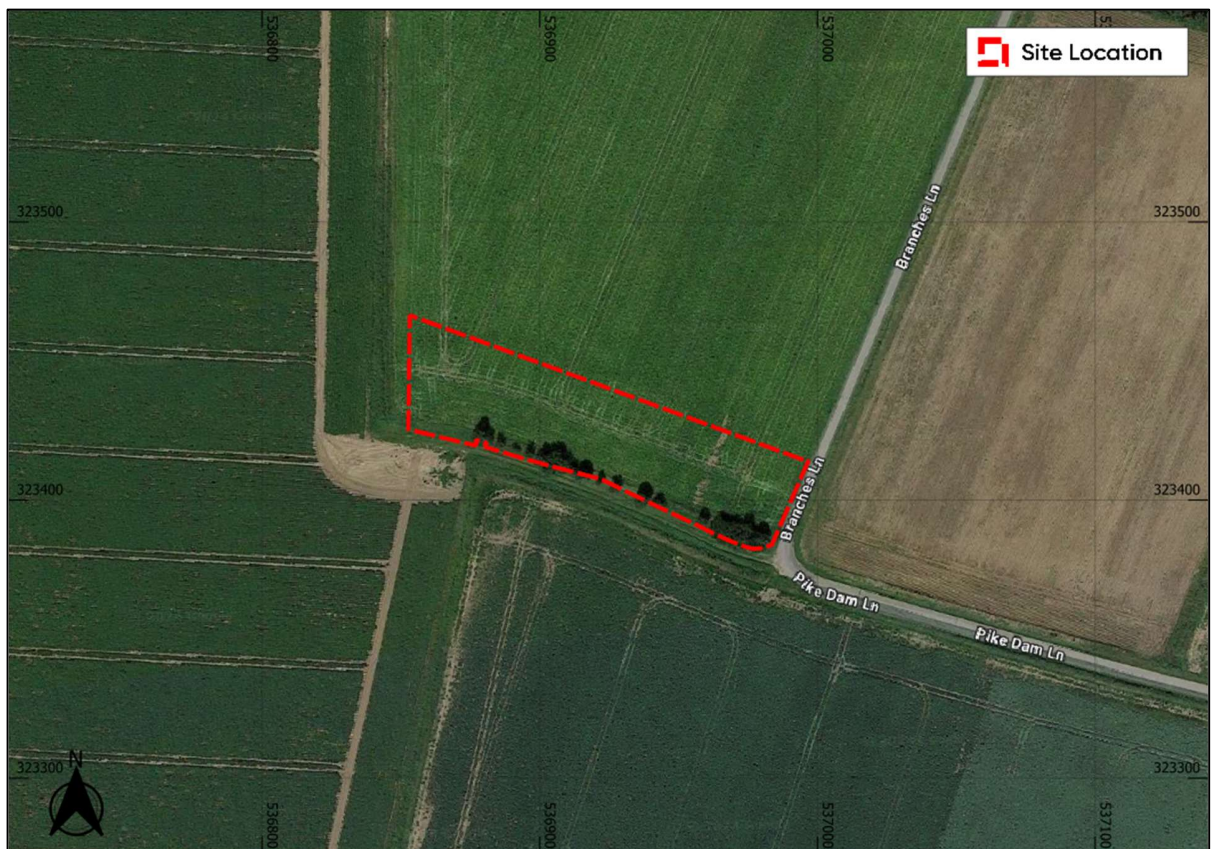


Figure 1: Site Location (Base map and data from Google Satellite Imagery ©)

- 1.4. In the absence of a topographical survey, Environment Agency Light Detection and Ranging (LiDAR) data Digital Terrain Model has been used to review the topography of the site. The LiDAR data shows the ground elevations of the site vary between approximately 2.34 metres Above Ordnance Datum (m AOD) and 2.80m AOD (1m LiDAR data) (Figure 2). The site is understood to slope slightly from east to west.

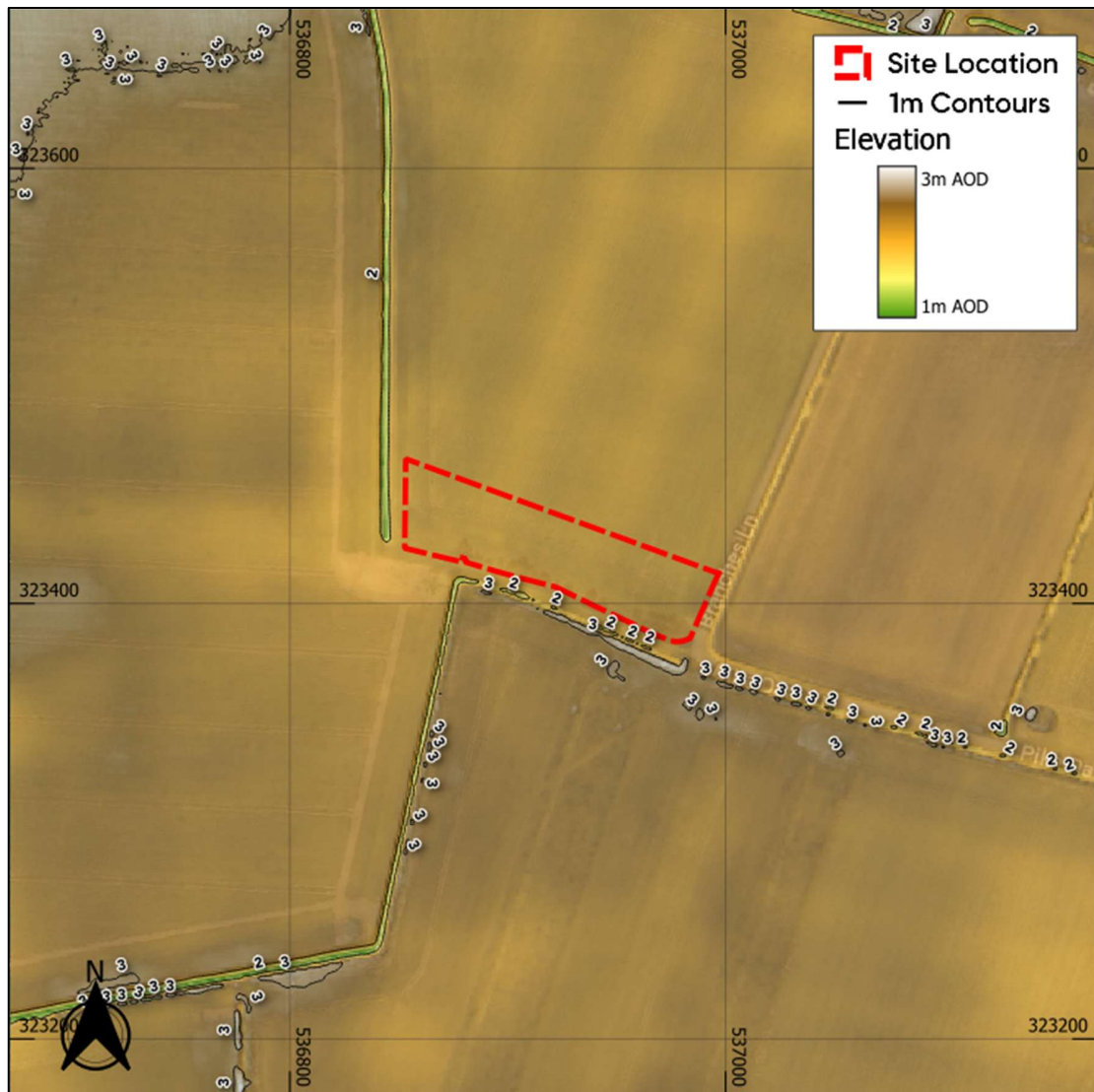


Figure 2: Site Topography (Base map and data from Google Satellite Imagery ©). Contains public sector information licensed under the Open Government Licence v3.0)

- 1.5. South Holland District Council is the Local Planning Authority (LPA) for the site and Lincolnshire County Council is the designated Lead Local Flood Authority (LLFA). The site sits within the Environment Agency's Lincolnshire and Northamptonshire region.

Planning Policy and Guidance

1.6. UK government planning guidance states¹ that an FRA is required for developments which are:

- *in flood zone 2 or 3 including minor development and change of use*
- *more than 1 hectare (ha) in flood zone 1*
- *less than 1 ha in flood zone 1, including a change of use in development type to a more vulnerable class (for example from commercial to residential), where they could be affected by sources of flooding other than rivers and the sea (for example surface water drains, reservoirs)*
- *in an area within flood zone 1 which has critical drainage problems as notified by the Environment Agency*

1.7. The site lies within Flood Zone 3 based on the EA Flood Map for Planning. Therefore, according to NPPF an FRA is required.

1.8. The objective of this FRA is to demonstrate that the proposals are acceptable in terms of flood risk. This report summarises the findings of the study and specifically addresses the following issues in the context of the current legislative regime:

- Fluvial/tidal flood risk
- Surface water flood risk
- Risk of flooding from other sources

¹ <https://www.gov.uk/guidance/flood-risk-assessment-for-planning-applications#when-you-need-an-assessment>

2. Planning Policy

National Planning Policy Framework (NPPF)

- 2.1. Inappropriate development in a flood risk area could pose significant risk in terms of personal safety and damage to property for the occupiers of the development or for people elsewhere. The approach taken in the assessment of flood risk at the planning stage is set out in national, regional, and local planning policy and associated guidance. This section summarises the key policies and guidance relevant to the proposed development.
- 2.2. The National Planning Policy Framework² (NPPF) (MHCLG, 2024) which includes UK Government policy on development and flood risk states:

170. Inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risk (whether existing or future). Where development is necessary in such areas, the development should be made safe for its lifetime without increasing flood risk elsewhere.

176. Applications for some minor development and changes of use should also not be subject to the sequential test, nor the exception test [set out below], but should still meet the requirements for site-specific flood risk assessments set out in footnote 63.

181. When determining any planning applications, local planning authorities should ensure that flood risk is not increased elsewhere. Where appropriate, applications should be supported by a site-specific flood-risk assessment. Development should only be allowed in areas at risk of flooding where, in the light of this assessment (and the sequential and exception tests, as applicable) it can be demonstrated that:

- a) within the site, the most vulnerable development is located in areas of lowest flood risk, unless there are overriding reasons to prefer a different location;*

² <https://www.gov.uk/guidance/national-planning-policy-framework>, last updated Dec 2024

- b) the development is appropriately flood resistant and resilient such that, in the event of a flood, it could be quickly brought back into use without significant refurbishment;*
- c) it incorporates sustainable drainage systems, unless there is clear evidence that this would be inappropriate;*
- d) any residual risk can be safely managed; and*
- e) safe access and escape routes are included where appropriate, as part of an agreed emergency plan.*

2.3. Footnote 63 of the NPPF states:

A site-specific flood risk assessment should be provided for all development in Flood Zones 2 and 3. In Flood Zone 1, an assessment should accompany all proposals involving: sites of 1 hectare or more; land which has been identified by the Environment Agency as having critical drainage problems; land identified in a strategic flood risk assessment as being at increased flood risk in future; or land that may be subject to other sources of flooding, where its development would introduce a more vulnerable use.

2.4. Flood Zones in England are defined as follows:

Table 1: Flood Zone Definitions

Flood Zone	Definition
Zone 1 Low Probability	Land having less than 1 in 1,000 annual probability of river or sea flooding (all land outside Zones 2 and 3).
Zone 2 Medium Probability	Land having between a 1 in 100 and 1 in 1,000 annual probability of river flooding; or land having between a 1 in 200 and 1 in 1,000 annual probability of sea flooding.
Zone 3a High Probability	Land having a 1 in 100 or greater annual probability of river flooding; or Land having a 1 in 200 or greater annual probability of sea flooding.
Zone 3b The Functional Floodplain	This zone comprises land where water from rivers or the sea has to flow or be stored in times of flood. The identification of functional floodplain should take account of local circumstances and not be

defined solely on rigid probability parameters. Functional floodplain will normally comprise:

land having a 3.3% or greater annual probability of flooding, with any existing flood risk management infrastructure operating effectively; or

land that is designed to flood (such as a flood attenuation scheme), even if it would only flood in more extreme events (such as 0.1% annual probability of flooding).

Local planning authorities should identify in their Strategic Flood Risk Assessments areas of functional floodplain and its boundaries accordingly, in agreement with the Environment Agency. (Not separately distinguished from Zone 3a on the Flood Map)

- 2.5. An FRA should be appropriate to the scale, nature, and location of the development. It should identify and assess the risk from all sources of flooding to and from the development and demonstrate how any flood risks will be managed over the lifetime of the development.
- 2.6. An assessment of hydrological impacts should be undertaken, including to surface water runoff and impacts to drainage networks in order to demonstrate how flood risk to others will be managed following development and taking climate change into account.
- 2.7. The Planning Practice Guidance, which was substantially revised in March 2015 in relation to drainage, requires that sustainable drainage systems (SuDS) should be considered and included where practicable, in line with Defra Technical Standards³.

Local/Regional Planning Policy

- 2.8. The Local Plan prepared jointly by Boston Borough Council and Lincolnshire County Council (the LLFA for the site), sets out the policies for development in the South Holland District Council boundary. The proposed site lies under the jurisdiction of the South Holland District Council LPA and therefore will be required to adhere to the Local Plan policies. The Local Plan 2011-

3 Technical Standards Accessed Online

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/415773/sustainable-drainage-technical-standards.pdf

2036⁴ (Adopted March 2019) document provides the following policies on flood risk management and sustainable drainage;

Policy 4: Approach to Flood Risk

Development proposed within an area at risk of flooding (Flood Zones 2 and 3 of the Environment Agency's flood map or at risk during a breach or overtopping scenario as shown on the flood hazard and depths maps in the Strategic Flood Risk Assessment) will be permitted, where:

- 1. It can be demonstrated that there are no other sites available at a lower risk of flooding (i.e. that the sequential test is passed). The sequential test will be based on a Borough or District wide search area of alternative sites within the defined settlement boundaries, unless local circumstances relating to the catchment area for the development justify a reduced search area, i.e. there is a specific need for the development in that location. The sequential test is not required for sites allocated in the Local Plan, minor development or change of use (except for a change of use to a caravan, camping or chalet site, or to a mobile home or park home site).*
- 2. It can be demonstrated that essential infrastructure in FZ3a & FZ3b, highly vulnerable development in FZ2 and more vulnerable development in FZ3 provide wider sustainability benefits to the community that outweigh flood risk.*
- 3. The application is supported with a site-specific flood risk assessment, covering risk from all sources of flooding including the impacts of climate change and which:*
 - a. demonstrate that the vulnerability of the proposed use is compatible with the flood zone;*
 - b. identify the relevant predicted flood risk (breach/overtopping) level, and mitigation measures that demonstrate how the development will be made safe and that occupants will be protected from flooding from any source;*
 - c. propose appropriate flood resistance and resilience measures (following the guidance outlined in the Strategic Flood Risk Assessment), maximising the use*

⁴ <https://www.southeastlincslocalplan.org/wp-content/uploads/2019/02/Local-Plan-text-March-2019.pdf>

of passive resistance measures (measures that do not require human intervention to be deployed), to ensure the development maintains an appropriate level of safety for its lifetime;

d. include appropriate flood warning and evacuation procedures where necessary (referring to the County's evacuation routes plan), which have been undertaken in consultation with the authority's emergency planning staff;

e. incorporates the use of Sustainable Drainage Systems (SuDS) (unless it is demonstrated that this is not technically feasible) and confirms how these will be maintained/managed for the lifetime of development (surface water connections to the public sewerage network will only be permitted in exceptional circumstances where it is demonstrated that there are no feasible alternatives);

f. demonstrates that the proposal will not increase risk elsewhere and that opportunities through layout, form of development and green infrastructure have been considered as a way of providing flood betterment and reducing flood risk overall;

g. demonstrates that adequate foul water treatment and disposal already exists or can be provided in time to serve the development;

h. ensures suitable access is safeguarded for the maintenance of water resources, drainage and flood risk management infrastructure.

Development in all flood zones, and development over 1 hectare in size in Flood Zone 1, will need to demonstrate that surface water from the development can be managed and will not increase the risk of flooding to third parties.

Change of use of existing buildings will be supported providing they do not pose an increase in risk to people. Change of use that would result in self-contained ground floor residential accommodation in areas of hazard rating 'danger for some', 'danger for most' and 'danger for all' will not be supported. In these areas unrestricted access to a habitable room above the flood level and an emergency evacuation plan will be required.

Caravans, mobile homes and park homes intended for permanent residential use will not be permitted in areas at risk of flooding. Caravan, chalet, log cabin, camping and touring sites at risk of fluvial flooding where there is a 'danger for most' and 'danger

for all' will not be permitted. Occupancy of caravan, chalet, log cabin, camping and touring sites at risk of tidal flooding will not be permitted to open between 1st November in any one year and the 14th March in the succeeding year.

No development will be permitted within a 50m buffer from the toe of the raised Witham Haven Banks (flood defences), as shown on the indicative Plan contained in Appendix 10, to allow access for construction and maintenance.

Flood risk management infrastructure shall be provided at the strategic level, where development opportunities allow, to reduce the hazard and probability of flooding.

- 2.9. Lincolnshire County Council have also provided SuDS Guidance for developers⁵ which has been consulted as a part of the completion of this strategy.

Sequential and Exception Tests

- 2.10. The Sequential and Exception Tests are applied in specific cases defined by UK Government policy. Their purpose is to drive development to areas of low flood risk and to support developments which improve flood risk for developments in areas at risk of flooding.

Sequential Test

- 2.11. Under the NPPF all new planning applications should undergo a Sequential Test unless a Minor Development or a change of use application in accordance with paragraph 174 and footnotes 59 and 60.
- 2.12. The proposed development is for the siting of a primary substation and as such it is not feasible to locate the infrastructure elsewhere – this is given that the substation is to be constructed to serve the site locality. As such, the sequential test is understood to be unnecessary.

Exception Test

- 2.13. The Exception Test is applied to sites based on the Flood Zone and the nature of the development. As the proposed development consists of electricity infrastructure it would be classed as 'Essential Infrastructure' in line with government development use classes.

⁵ <https://www.lincolnshire.gov.uk/highways-planning/Guidance-for-developers/2>

- 2.14. The Flood Risk Vulnerability Classification table⁶ provided below in Table 2 shows which vulnerabilities are appropriate in each Flood Zone.
- 2.15. The proposed development sits wholly within Flood Zone 3 and the development consists of 'Essential Infrastructure' uses. Table 2 shows Flood Zone 3 is only an appropriate location for 'Essential Infrastructure' uses with an Exception Test.

Table 2: Flood risk vulnerability and flood zone 'incompatibility'

Flood Zones	Flood Risk Vulnerability Classification				
	Essential Infrastructure	Highly Vulnerable	More Vulnerable	Less Vulnerable	Water Compatible
Zone 1	✓	✓	✓	✓	✓
Zone 2	✓	Exception Test required	✓	✓	✓
Zone 3a	Exception Test required	x	Exception Test required	✓	✓
Zone 3b	Exception Test required	x	x	x	✓

- 2.16. There are two elements to the Exception Test which must be met before development can be considered appropriate;
- development that has to be in a flood risk area will provide wider sustainability benefits to the community that outweigh flood risk; and
 - the development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall.
- 2.17. In relation to the first part of the Exception Test, this scheme seeks to improve the electricity infrastructure within the site locality which would provide a wider benefit to the surrounding

⁶ <https://www.gov.uk/guidance/flood-risk-and-coastal-change#table2>

community. Additionally, this report demonstrates whether the site meets the second part of the Exception Test.

Summary

- 2.18. This flood risk assessment and surface water drainage strategy has been prepared with due consideration to the above local and national policy.

3. Consultation and Review

Consultation

- 3.1. The site sits within the Environment Agency's Lincolnshire and Northamptonshire region. The EA were contacted and asked to provide detailed flood modelling data in relation to the site address. In response the EA have provided Product 4 data which has been used in Section 4 of this report in order to analyse the flood risk to the site. A full copy of the Product 4 data will be included in Appendix B of this report.

Documents and Online Mapping

- 3.2. Local Governments and Lead Local Flood Authorities provide documents which contain data and policies on flood risk and new development in their areas. These documents are introduced and briefly summarised below. For the purposes of this FRA and SWDS, these documents have been reviewed for relevant information and any relevant data is discussed within the appropriate sub heading of this report.
- 3.3. The following sources of information have been reviewed for this assessment:
- Flood Map for Planning on the Environment Agency website <https://flood-map-for-planning.service.gov.uk/>
 - Long Term Flood Risk Information on the Environment Agency website <https://www.gov.uk/check-long-term-flood-risk>
 - National Planning Policy Framework (NPPF) (Ministry of Housing, Communities and Local Government, 2024)
 - Planning Practice Guidance - Flood Risk and Coastal Change (Department for Levelling Up, Housing and Communities, 2022)
 - Geoindex Onshore (British Geological Survey, 2024)
 - South East Lincolnshire Local Plan 2011-2036 (South East Lincolnshire Joint Strategic Planning Committee, 2019)

- Lincolnshire County Council Preliminary Flood Risk Assessment⁷ (Lincolnshire County Council, 2011)
- South East Lincolnshire Strategic Flood Risk Assessment⁸ (South East Lincolnshire Joint Strategic Planning Committee, 2017)
- CIRIA C753 SuDS manual⁹

Preliminary Flood Risk Assessment (PFRA)

- 3.4. The PFRA is a high-level appraisal of flood risk across Lead Local Flood Authority Lincolnshire County Council. The flood risk from all sources, including fluvial, surface water, groundwater, and surcharged sewers is evaluated. It is the basis upon which the Local Flood Risk Management Strategy is produced.
- 3.5. The PFRA summarises historical flood incidents in Lincolnshire County Council. The site is not recorded as having been affected by any flood event.

Strategic Flood Risk Assessment (SFRA)

- 3.6. The SFRA, published in 2017, provides the evidence base for the Local Planning Authority South Holland District Council Local Plan and guidance for consideration when determining planning applications.
- 3.7. The SFRA seeks to place new development into areas of lower flood risk taking into account current flood risk, future flood risk, and the effect a proposed development would have on the risk of flooding.
- 3.8. The SFRA mapping provided by South Holland District Council has been used throughout production of this report as a source of information, particularly pertaining to historical flood incidents.

⁷ <https://www.lincolnshire.gov.uk/downloads/file/4382/preliminary-flood-risk-assessment-report>

⁸ <https://www.southeastlincslocalplan.org/wp-content/uploads/2018/01/SE-Lincolnshire-SFRA-2017-v6-24th-Jan-2018.pdf>

⁹ https://www.ciria.org/CIRIA/Memberships/The_SuDs_Manual_C753_Chapters.aspx

CIRIA C753 SuDS manual

- 3.9. The CIRIA SuDS manual has been used throughout this SWDS in order to determine an appropriate strategy for the proposed development. This guidance covers the planning, design, construction and maintenance of Sustainable Drainage Systems (SuDS) to assist with their effective implementation within both new and existing developments. It looks at how to maximise amenity and biodiversity benefits and deliver the key objectives of managing flood risk and water quality. There is also supporting information covering topics such as materials, landscape design, maintenance, community engagement and costs and benefits.

4. Sources of Flood Risk

Tidal

- 4.1. Tidal flooding occurs when a high tide and high winds combine to elevate sea levels. An area behind coastal flood defences can still flood if waves overtop the defences or break through them. Tidal flooding can also occur a long way from the coast by raising river levels. Water may overtop the river bank or river defences when tide levels are high.

Hydrological Setting

- 4.2. The site lies within the Fens – a low-lying, flat, and expansive area in eastern England. This area is susceptible to rising sea levels due to their low-lying nature.
- 4.3. The source of flooding in the site area is understood to be tidally dominated – as indicated in the SFRA mapping repeated below (Figure 3).

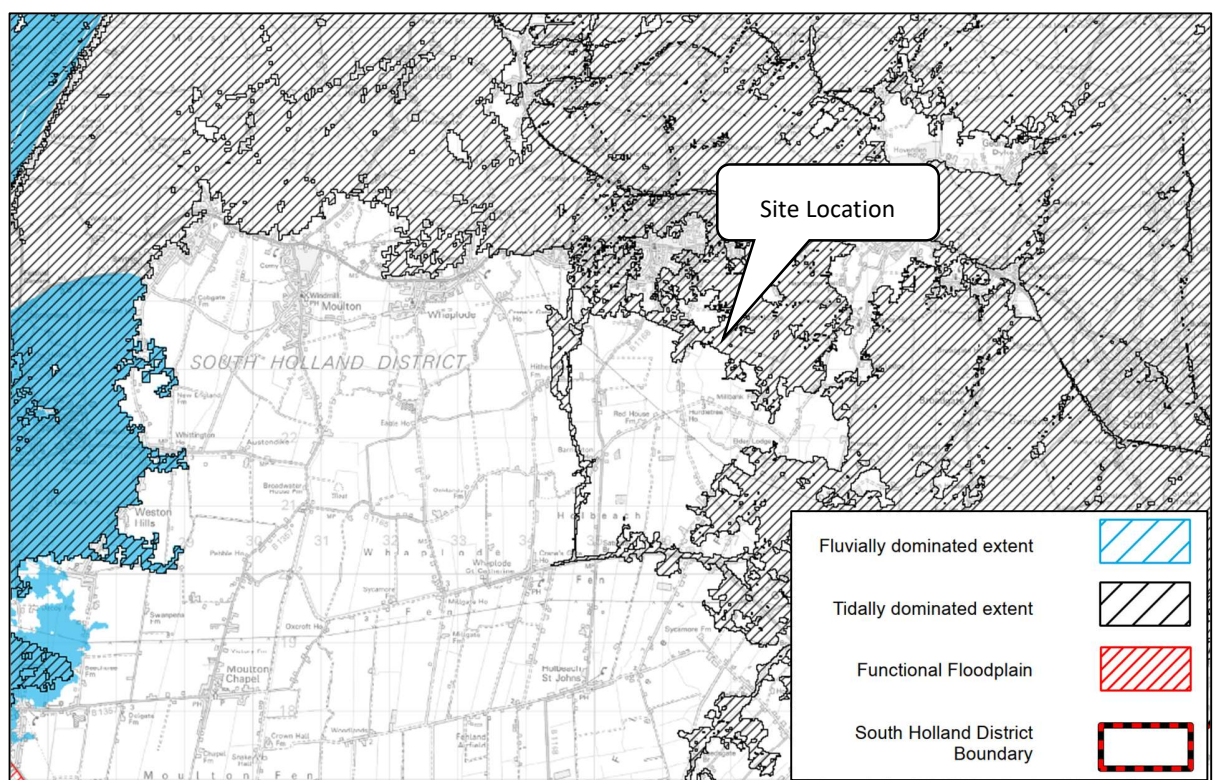


Figure 3: Fluvial and Tidally Dominant Flooding Areas (Source: SFRA, 2017)

Flood Defence Infrastructure

- 4.4. The following details in relation to the existing tidal defence infrastructure serving the site are stated in the EA Product 4 response;

'The existing tidal defences protecting this site from the Tidal Welland consist of earth embankments. They are in fair condition and reduce the risk of flooding (at the defence) to a 1% (1 in 100) chance of occurring in any year.

The existing tidal defences protecting this site from the Tidal Nene 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 existing tidal defences protecting this site from the Wash 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.

We inspect these defences routinely to ensure potential defects are identified.'

- 4.5. As such, the existing defences serving the site provide a minimum Standard of Protection (SoP) of at least the 1.0% AEP event.

EA Flood Map for Planning

- 4.6. The site is located wholly within Flood Zone 3 (Figure 4). Flood Zone 3 denotes a risk of flooding from tidal sources greater than 1 in 200 (0.5%) annual probability. The Flood Map indicates the area at risk of flooding, **assuming no flood defences exist.**

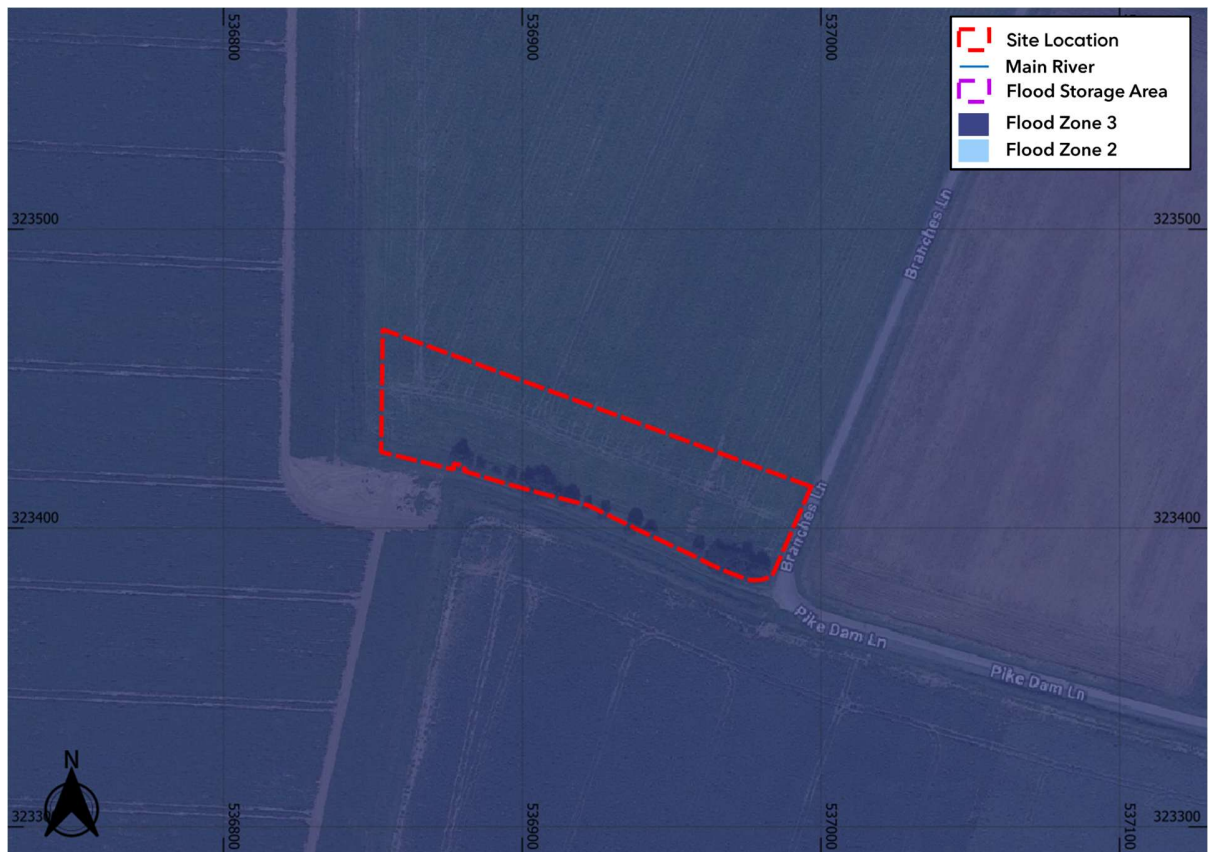


Figure 4: EA Flood Map for Planning (Base map and data from Google Satellite Imagery ©). Contains public sector information licensed under the Open Government Licence v3.0)

Present Day Risk

- 4.7. Given the presence of the existing tidal flood defences the site is considered to be at a low risk of tidal flooding in the defended present day scenario.
- 4.8. Additionally, the EA Product 4 response states the following in relation to the present day tidal flood risk (specifically in relation to the overtopping and breach scenarios);

- *'Your site is not affected by breaching of the tidal defences for the present day (2006) scenarios.'*
- *'Your site is not affected by overtopping of the defences for the present day (2006) and climate change (2115) scenarios, though may be at risk from breaching.'*

Future Flood Risk (Residual Risk Mapping)

- 4.9. The EA Product 4 Data provided includes mapping to show the residual flood risk to the site. The residual risk modelled outputs include the consequences of both overtopping and breaching of flood defences.
- 4.10. The model outputs provide results for both the present day and 2115 epoch. The 2115 epoch results are inclusive of appropriate climate change allowances for both sea level rise and for fluvial flows.
- 4.11. As stated above, the site is not affected by flooding in the present day or future (2115) overtopping model outputs.
- 4.12. In the modelled breach event for the 2115 epoch - 0.5%AEP return period event, the site is shown to be affected with flood depths ranging up to 0.50m (Figure 5).

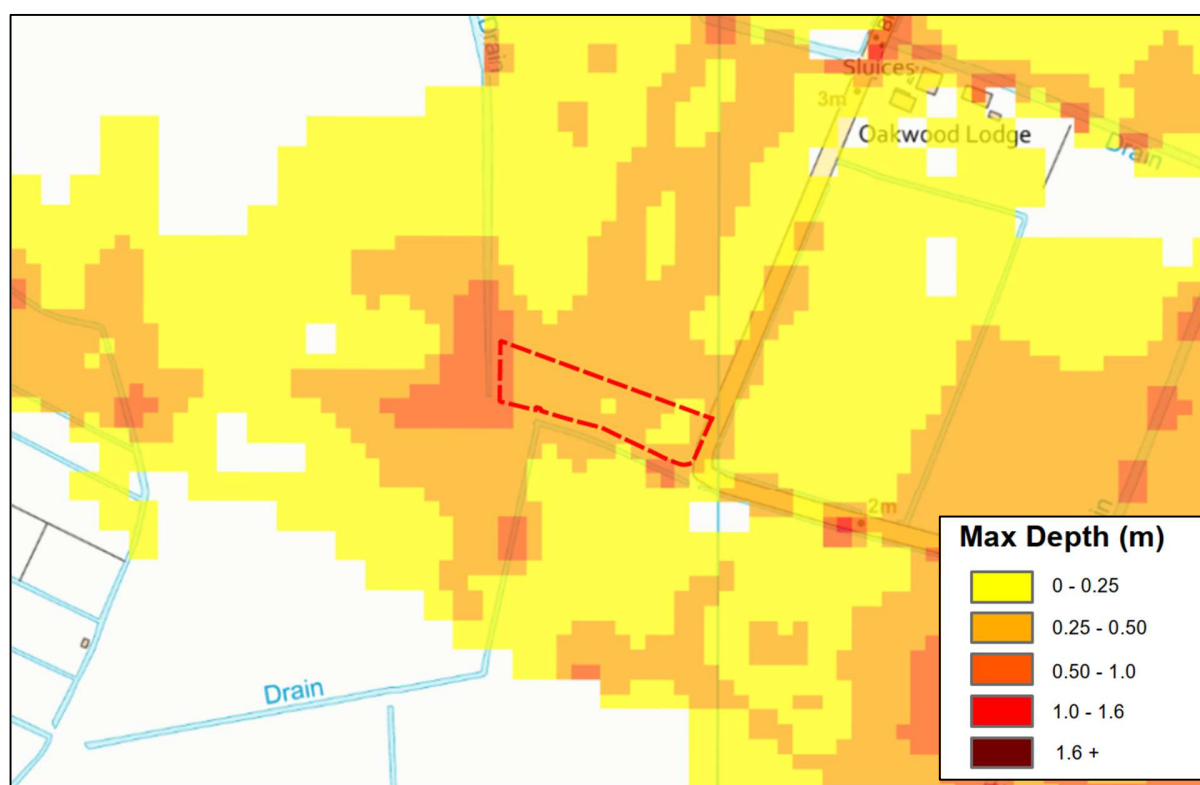


Figure 5: Lincolnshire and Northamptonshire Tidal Breaching Hazard Mapping (2115 Epoch – 0.5%AEP Event – EA Product 4 Data)

- 4.13. In the modelled breach event for the 2115 epoch - 0.1%AEP return period event, the site is shown to be affected with flood depths ranging up to 1.00m (Figure 6).

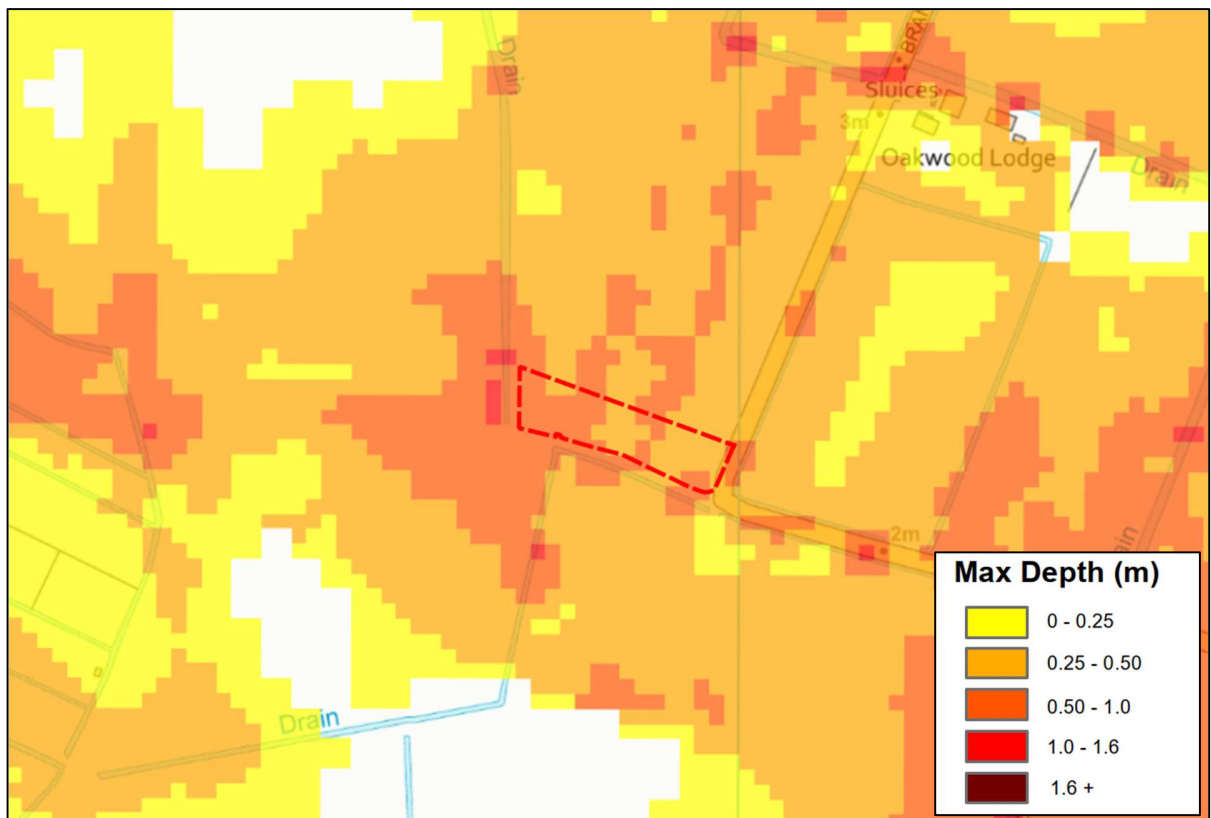


Figure 6: Lincolnshire and Northamptonshire Tidal Breaching Hazard Mapping (2115 Epoch – 0.1% AEP Event – EA Product 4 Data)

Tidal Flood Risk Summary

- 4.14. Based on the information above, the present day (defended) tidal flood risk is considered to be low. In the event of a breach of the existing defences in the 2115 epoch there is a residual risk of flooding and as such mitigation measures will be recommended in the Section 5 of this report.

Fluvial

- 4.15. Flooding from watercourses arises when flows exceed the capacity of the channel, or where a restrictive structure is encountered, resulting in water overtopping the banks into the floodplain.

Main Rivers and Ordinary Watercourses

- 4.16. There are no EA Main Rivers or mapped ordinary watercourses within the vicinity of the site. There are several drains/watercourses located within the vicinity of the site used for draining the agricultural land. Within the immediate vicinity of the site there are shown to be drainage ditches located on the south, east, and western perimeter of the site (Figure 7).

- 4.17. Any flood risk associated with the drains are understood to be driven by surface water (pluvial) mechanisms – the flood risk from this source is discussed in the subsequent sections of this report.



Figure 7: Drains within the Vicinity of the Site (Source: Heritage England Mapping, Contains OS data © Crown Copyright and database rights 2023 © Historic England)

- 4.18. Given the proximity of the proposed development to the drains bordering the site it is recommended that the Internal Drainage Board (IDB) responsible for the site location is consulted on any planning application. The IDB for the site area is the South Holland IDB.

EA Product 4 Consultation

- 4.19. The response received by the EA after request for detailed flood modelling data for the site was requested stated the following in relation to the fluvial flood risk;

This site is not considered to be at risk of flooding from main rivers.

Historical Fluvial Flooding

- 4.20. The EA Recorded and Historical Flood Outlines show that the site lies outside the extent of any recorded historical flooding events (Figure 8).



Figure 8: EA Historic Flood Mapping (Base map and data from Google Satellite Imagery ©. Contains public sector information licensed under the Open Government Licence v3.0)

Fluvial Flood Risk Summary

- 4.21. Based on the information above, the site is considered to be at a low of fluvial flooding.

Canals

- 4.22. The Canal and River Trust (CRT) generally maintains canal levels using reservoirs, feeders, and boreholes and manages water levels by transferring it within the canal system.
- 4.23. Water in a canal is typically maintained at predetermined levels by control weirs. When rainfall or other water enters the canal, the water level rises and flows out over the weir. If the level continues rising it will reach the level of the storm weirs. The control weirs and storm weirs are normally designed to take the water that legally enters the canal under normal conditions. However, it is possible for unexpected water to enter the canal or for the weirs to become obstructed. In such instances the increased water levels could result in water overtopping the towpath and flowing onto the surrounding land.

- 4.24. Flooding can also occur where a canal is impounded above surrounding ground levels and the retaining structure fails.
- 4.25. The nearest canal to the proposed development is located at a distance of greater than 1km. Therefore, the site is considered to be at a low risk of canal flooding.

Pluvial

- 4.26. Pluvial flooding can occur during prolonged or intense storm events when the infiltration potential of soils, or the capacity of drainage infrastructure is overwhelmed leading to the accumulation of surface water and the generation of overland flow routes.
- 4.27. The new National Flood Risk Assessment (NaFRA2), published in January 2025, has updated the Risk of Flooding from Surface Water (RoFSW) products which show the chance of flooding from surface water to areas of land.
- 4.28. The RoFSW products are an assessment of where surface water flooding may occur when rainwater does not drain away through the normal drainage systems or soak into the ground but lies on or flows over the ground instead. It includes information about flooding extents and depths including the potential impact of climate change on flood risk, based on the latest UK Climate Projections (UKCP18).
- 4.29. Risk is displayed as one of three likelihood categories:
- High - greater than or equal to 1 in 30 (3.3%) chance of flooding in any year.
 - Medium – Less than 1 in 30 (3.3%) but greater than or equal to 1 in 100 (1%) chance of flooding in any given year.
 - Low – Less than 1 in 100 (1%) but greater than or equal to 1 in 1000 (0.1%) chance of flooding in any given year.
- 4.30. The new RoFSW depth mapping shows the annual chance of flooding (based on the three risk categories listed above) beyond a specific depth, for depths at the following intervals from 20cm to 120cm:
- 0.2m, 0.3m, 0.6m, 0.9m, 1.2m
- 4.31. As well as present day risk of flooding from surface water, climate change scenarios have been produced to indicate the predicted impacts of climate change on future flood risk. The climate change allowances are based on the latest UK Climate Projections (UKCP18) from the Met Office, using the Representative Concentration Pathway (RCP) 8.5. A near-term epoch (2040 –

2060 “2050s” epoch) and central allowances are being used initially, to support short and medium-term decisions informed by the highest flood likelihood projections.

Present Day

- 4.32. The EA Online 'Flood Risk from Surface Water' map (Jan 2025) indicates that the site is at a very low risk of surface water flooding, with small areas at a low risk of surface water flooding.

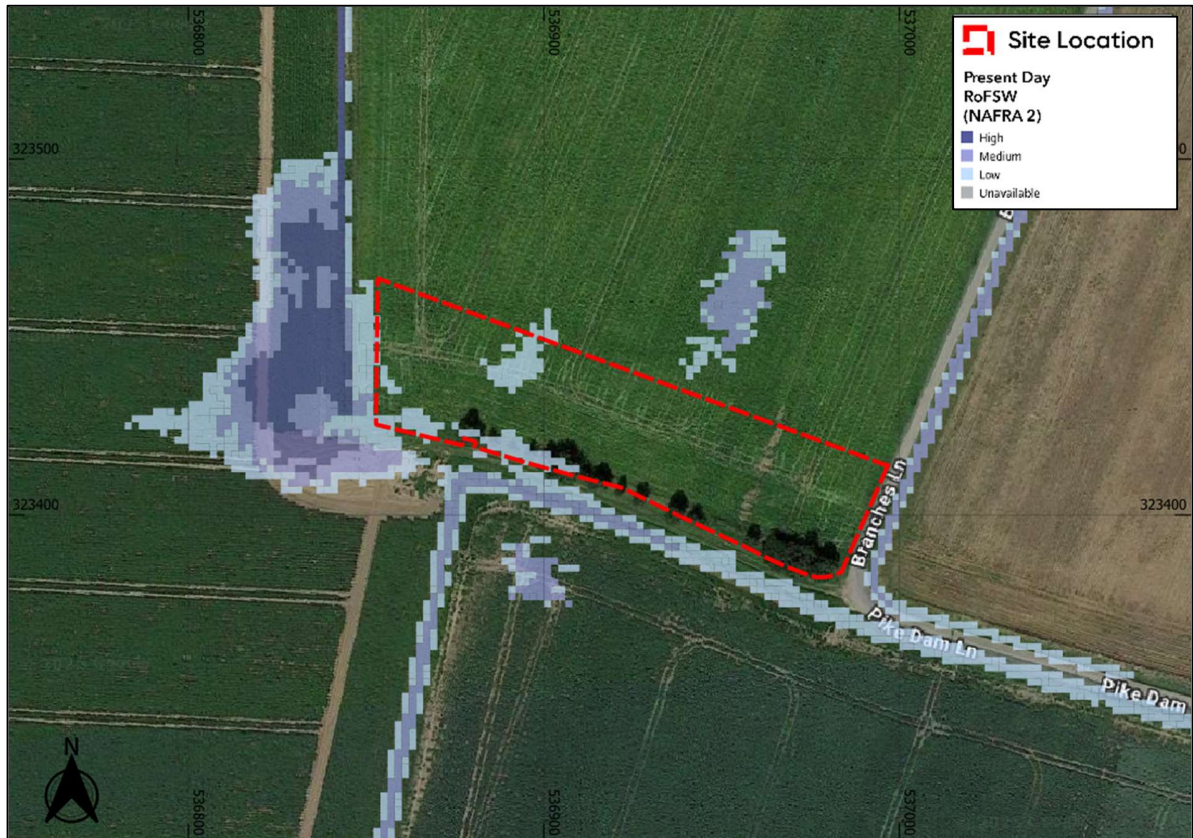


Figure 9: EA Surface Water Flood Risk Mapping Present Day Extent (Base map and data from Google Hybrid © Contains public sector information licensed under the Open Government Licence v3.0)

- 4.33. Figure 10 shows that according to the EA mapping, during the present day scenario the majority of the site is not at risk of surface water flooding to depths exceeding 0.2m. There are isolated areas adjacent to the southern boundary at risk of exceeding 0.2m, however, these are considered negligible and do not affected the proposed development.

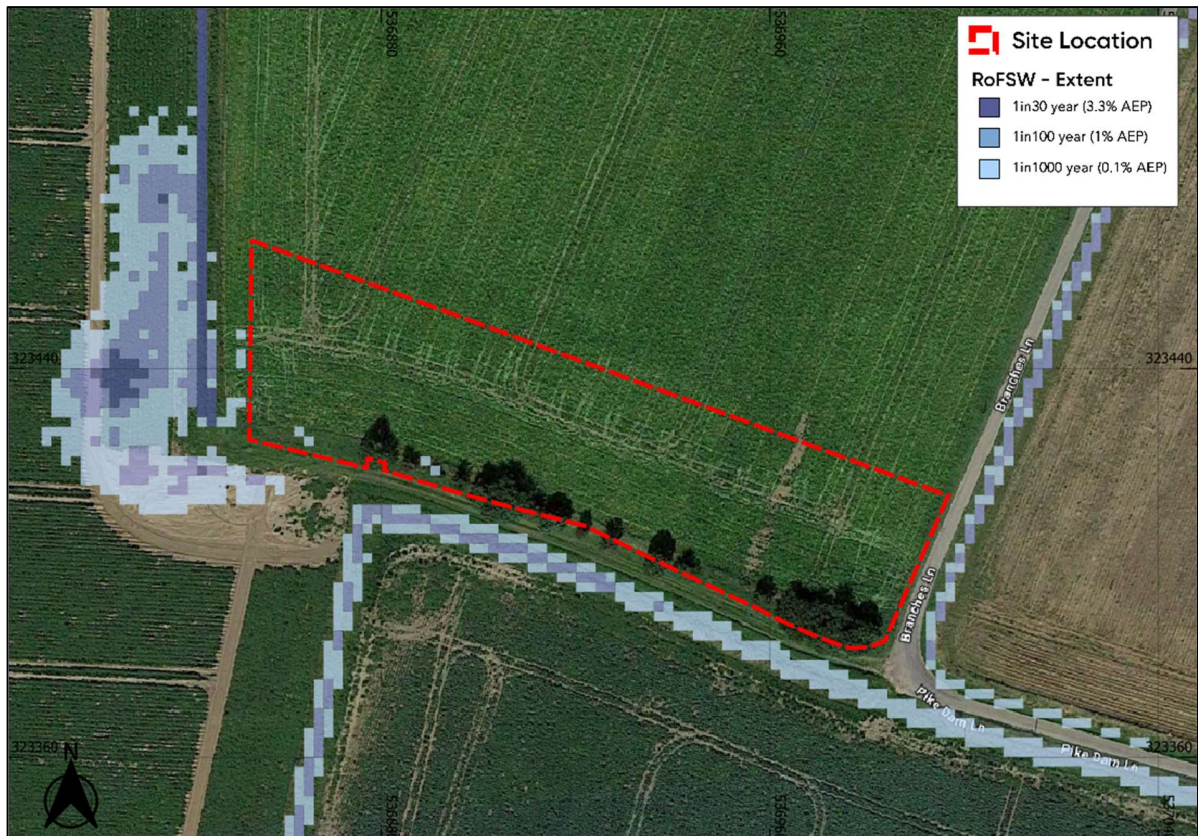


Figure 10: EA Surface Water Flood Risk Mapping Present Day – Exceeding 0.2m Depths (Base map and data from Google Hybrid
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Climate Change

- 4.34. The EA Online 'Flood Risk from Surface Water' map (Jan 2025) indicates that during the climate change scenario the site is at a very low risk of surface water flooding, with areas at a low risk of surface water flooding (Figure 11).

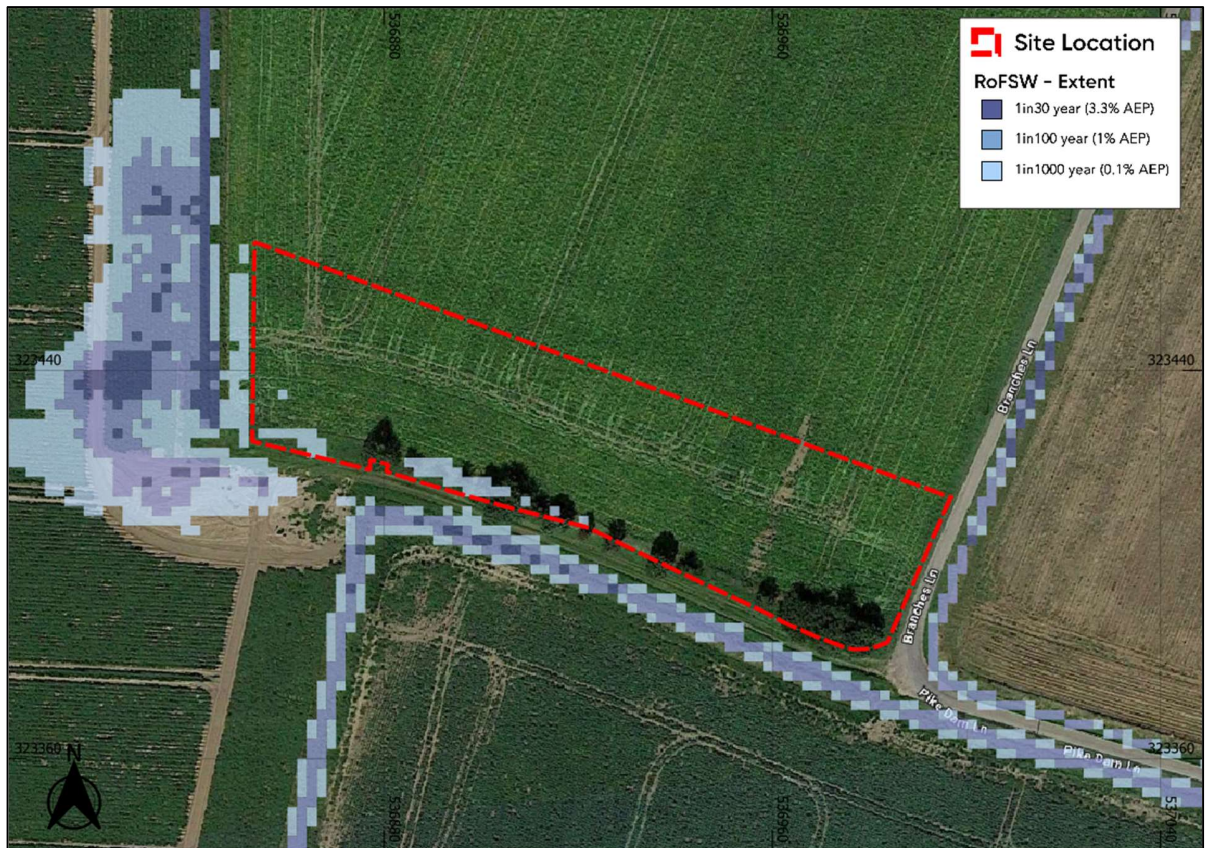


Figure 12: EA Surface Water Flood Risk Mapping Climate Change – Exceeding 0.2m Depths (Base map and data from Google Hybrid © Contains public sector information licensed under the Open Government Licence v3.0)

- 4.36. In summary, based on the information available, the site is considered to be at a low risk of surface water flooding.

Reservoirs

- 4.37. Large waterbodies or reservoirs that have walls built above the surrounding ground level pose a risk of flooding. Walls could fail due to old age, accident, or because excess flood water has been added to the reservoir. Although a breach is unlikely, the consequences would be significant, leading to rapid inundation of the downstream floodplain.
- 4.38. According to the EA's Flood Risk from Reservoirs mapping the site is outside flood extents in the event of reservoir flooding (Figure 13).



Figure 13: EA Reservoir Flood Risk Mapping (Base map and data from Google Satellite Imagery ©). Contains public sector information licensed under the Open Government Licence v3.0)

- 4.39. Based on the information above, the site is considered to be at a low risk of reservoir flooding.

Groundwater

- 4.40. Groundwater flooding occurs in areas where underlying geology is permeable, and water can rise within the strata sufficiently to breach the surface.
- 4.41. The British Geological Survey's (BGS) mapping shows superficial deposits of Tidal Flat Deposits comprised of clay and silt underlying the site. The bedrock underlying the site is Ampthill Clay Formation comprised of mudstone.
- 4.42. No BGS Historical Borehole records are shown within the vicinity of the site (300m radius).
- 4.43. Details from a publicly available soils data website suggests that the site location is underlain with '*Loamy and clayey soils of coastal flats with naturally high groundwater.*' Given the presence of the extensive drain/ditch network within the vicinity of the site – groundwater is likely routed and held within the ditch network.

- 4.44. The PFRA (2011) presents the EA's Areas Susceptible to Groundwater Flooding mapping, which assesses the risk of groundwater flooding. The site is within a 1km cell which is not recognised as being at risk of groundwater flooding (Figure 14).

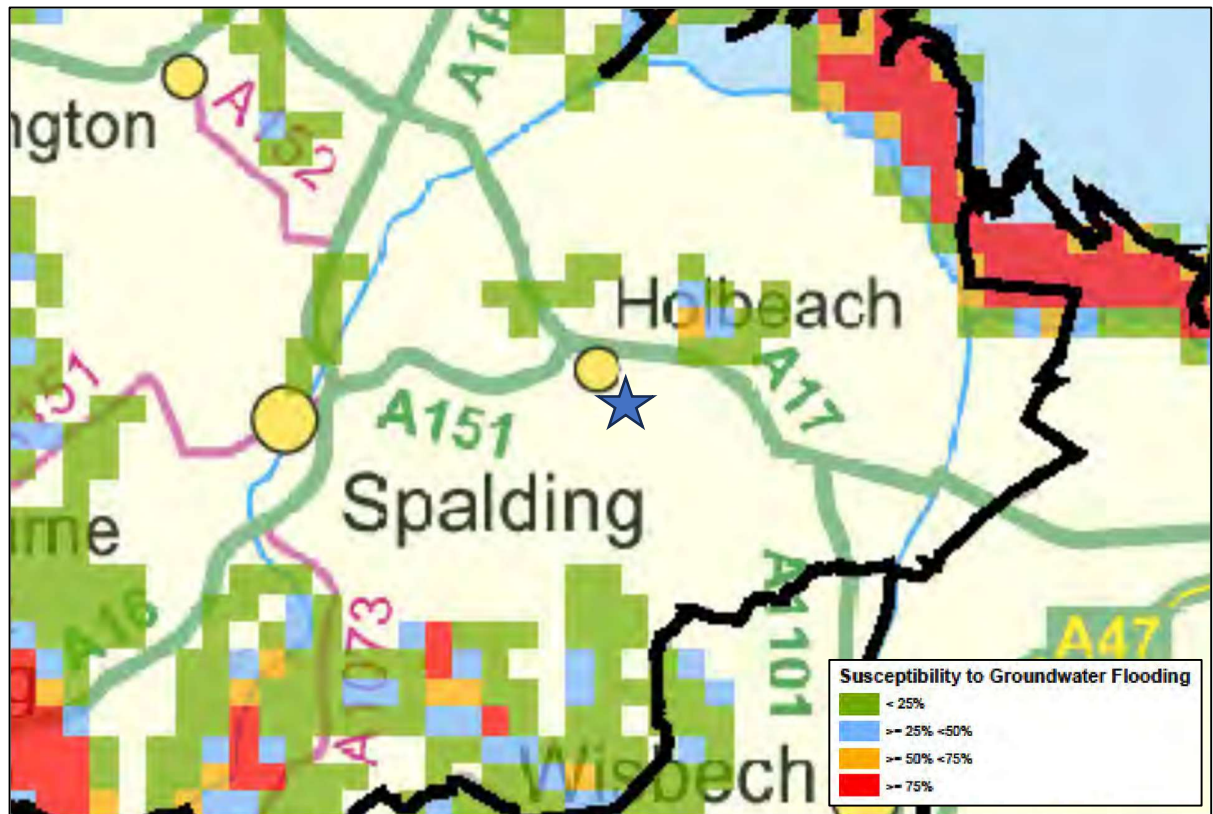


Figure 14: Susceptibility to Groundwater Flooding (Lincolnshire County Council PFRA, 2011 – Site Located at Blue Star)

- 4.45. Based on the information above and considering that the proposed development does not include any subterranean elements, the groundwater flood risk to the site is considered to be low.

Sewers

- 4.46. Foul or surface water sewers can be a cause of flooding if the drainage network becomes overwhelmed, either by blockage or due to local development beyond the designed capabilities of the drainage system.
- 4.47. The SFRA provides mapping of historical sewer flood incident records kept by the local authority and the sewerage provider for the site location (Anglian Water). The site is shown to lie outside the vicinity of any recorded sewer flooding incidents.

- 4.48. Due to the rural nature of the site it is unlikely that the site is currently served by public sewer infrastructure.
- 4.49. Based on the information above, the site is considered to be at a low risk of sewer flooding

5. Flood Risk Mitigation

Tidal

- 5.1. Based on this assessment, the present day (defended) tidal flood risk is considered to be low. In the event of a breach of the existing defences in the 2115 epoch there is a residual risk of flooding and as such mitigation measures are recommended.

Platform Siting

- 5.2. In the modelled breach event for the 2115 epoch - 0.1%AEP return period event, the site is shown to be affected with flood depths ranging up to 1.00m. As such, in order for the equipment to remain safe and operational during flooding/breach event, it is recommended that any vulnerable equipment proposed within the site bounds be sited on a raised plinth set at 1.00m above the existing ground levels. An additional raising of 300mm for freeboard allowance is recommended, where feasible.
- 5.3. It is recommended that the raised plinth be constructed using steel with an open void space beneath the landing, rather than being constructed from a solid concrete slab. The reason for this being to limit the increase in flood risk elsewhere as a consequence of the development.

Safe Access/Egress

- 5.4. It is noted that in a breach event access/egress to the site could be affected. However, the proposals consist of an unmanned primary substation and therefore safe access/egress is not required. Any scheduled maintenance when the site will need to be attended should be done so whilst no flood warning is in place.

Flood Warnings

- 5.5. As a precaution and risk reduction, the owner/manager of the site should sign up the 'Holbeach, Fleet, Gedney and surrounding areas' EA flood warning service. This service allows owners/managers to register an address, which is at risk of flooding, along with contact details so that in the event of a flood being forecast, the site owners/managers will be sent an alert directly to their chosen method of contact.
- 5.6. Flood warnings/alerts can be enforced at any time of the day or night. Signing up for this service provides owners/managers some notice before a flood event. The amount of time afforded

before a flood occurs depends on the site specific location (e.g. proximity to the source of flooding, topography of the surrounding area) and the flood mechanism (e.g. bank overtopping versus a breach event).

- 5.7. Any scheduled maintenance when the site will need to be attended should be done so whilst there is no flood warning in place.

Other Sources

- 5.8. Flood risk from canals, pluvial, reservoirs, fluvial, groundwater and sewers sources are considered to be low, therefore no further specific mitigation is required.

Increase to Flood Risk Elsewhere

- 5.9. As stated above, it is recommended that the raised plinth be constructed using steel with an open void space beneath the landing, rather than being constructed from a solid concrete slab. The reason for this being to limit the increase in flood risk elsewhere as a consequence of the development.

6. Surface Water Drainage Strategy

- 6.1. With increasing urbanisation, the ability for precipitation to penetrate the hard paved surfaces to the groundwater below is inhibited. This results in increased flood risk, overstressed combined sewer infrastructure, and reduced ability to replenish aquifers. Sustainable Drainage Systems (SuDS) mitigate these issues by replicating natural processes to manage rainfall.

Ground Conditions

- 6.2. The British Geological Survey's (BGS) mapping shows superficial deposits of Tidal Flat Deposits comprised of clay and silt underlying the site. The bedrock underlying the site is Ampthill Clay Formation comprised of mudstone.
- 6.3. Details from a publicly available soils data website suggests that the site location is underlain with '*Loamy and clayey soils of coastal flats with naturally high groundwater.*' Given the high natural groundwater levels it is unlikely that infiltration techniques will be feasible considering that the invert level of any infiltrating features should be set at least 1.0m above the groundwater level.
- 6.4. For the purposes of this strategy, infiltration is not deemed to be feasible.

Nearby Watercourses

- 6.5. There are several drains/watercourses located within the vicinity of the site used for draining the agricultural land. Within the immediate vicinity of the site there are shown to be drainage ditches located on the south, east, and western perimeter of the site. The existing parcel of land is assumed to drain via the ditch network. The ditch network could provide a feasible outfall for the proposed drainage strategy.
- 6.6. If a connection to the drainage network is proposed it is recommended that the Internal Drainage Board (IDB) responsible for the site location is consulted. The IDB for the site area is the South Holland IDB.

Existing Drainage Infrastructure

- 6.7. Due to the rural nature of the site it is understood that there is no public or private sewerage assets currently serve the address.

Greenfield Runoff Rates

- 6.8. The total impermeable catchment area associated with this strategy is 991m². This catchment represents the proposed impermeable areas associated with the proposed 11kV building, T1 and T2 transformers, and tarmac access road.
- 6.9. The remaining areas within the application boundary are understood to be comprised of permeable materials (including the site surfacing details in Note 1 – see Appendix A) and have therefore been excluded from attenuation calculations.
- 6.10. The greenfield runoff rate (Q_{BAR} rural) was calculated in InfoDrainage (v2025.2) using the ICP SuDS methodology. For sites smaller than 50 ha, the IH124 method is applied and the results multiplied by a scale factor equal to the site area (in hectares) divided by 50. Q_{BAR} was calculated using the following formula (equation yields m³/s):

$$Q_{BAR_{rural}} = 0.00180 \times AREA^{0.89} \times SAAR^{1.17} \times SOIL^{2.17}$$

- 6.11. The greenfield runoff rate (Q_{BAR}) for the proposed impermeable catchment of 991m² (excluding urban creep) was calculated to be 0.14l/s.
- 6.12. Given the low greenfield rates (0.14l/s), it is not possible to discharge runoff at this rate due to the increased risk of blockage associated with small diameter flow restriction devices which would be required. Instead, runoff has been restricted to as low as practical, 1.0l/s maximum.

Climate Change

- 6.13. The Environment Agency Peak Rainfall Climate Change Allowance guidance was reviewed and subsequently the Defra Peak Rainfall Allowances Map was assessed to determine appropriate climate change allowances to inform the surface water drainage strategy. The upper end allowances for the Welland Management Catchment have been used for both the 3.3% and 1% annual exceedance probability events for the 2070s epoch (35% and 40% respectively).

InfoDrainage Modelling Criteria

- 6.14. InfoDrainage Software (v2025.2) was used to calculate the indicative attenuation volumes from the development proposals area, the criteria shown in Table 3.

Table 3: Proposed Network – Simulation Criteria

Catchment Area Simulation Parameters	
Rainfall Data	FSR
M5-60	18.9mm
Ratio R	0.400
Return Periods	1, 30, 30+35CC, 100, 100+40CC
Storm Durations	15, 30, 60, 120, 240, 360, 480, 960, 1140 minute
Volumetric Runoff Co	0.9 (standard value for roofs and paved areas) for both summer and winter storm seasons.
Percentage Impervious	100%
Time of Concentration	5 minutes
Urban Creep (%)	10%

- 6.15. As mentioned above, given the small catchment size of the site, it is not possible to reduce runoff down to the greenfield runoff rate without serious increased risk of blockage. Instead, flows have been limited to as low as practicable (1.0L/s maximum).

Surface Water Drainage Strategy

- 6.16. In accordance with the SuDS management train approach, the use of various SuDS measures to reduce and control surface water flows have been considered in detail for the development. The management of surface water has been considered in respect to the SuDS hierarchy below (Table 4), as detailed in the CIRIA 753 "The SuDS Manual" (section 3.2.3).

Table 4: SuDS Drainage Hierarchy

SUDS DRAINAGE HIERARCHY				
			Suitability	Comment
	1.	Use infiltration techniques, such as porous surfaces in non-clay areas	X	The British Geological Survey's (BGS) mapping shows superficial deposits of Tidal Flat Deposits comprised of clay and silt underlying the site. The bedrock underlying the site is Ampthill Clay Formation comprised of mudstone. Details from a publicly available soils data website suggests that the site location is underlain with 'Loamy and clayey soils of coastal flats with naturally high groundwater.' Given the high natural groundwater levels it is unlikely that infiltration techniques will be feasible considering that the invert level of any

SUDS DRAINAGE HIERARCHY				
			Suitability	Comment
				infiltrating features should be set at least 1.0m above the groundwater level.
	2.	Discharge to surface waters	✓	There are several drains/watercourses located within the vicinity of the site used for draining the agricultural land. Within the immediate vicinity of the site there are shown to be drainage ditches located on the south, east, and western perimeter of the site. The existing parcel of land is assumed to drain via the ditch network. The ditch network could provide a feasible outfall for the proposed drainage strategy. If a connection to the drainage network is proposed it is recommended that the Internal Drainage Board (IDB) responsible for the site location is consulted. The IDB for the site area is the South Holland IDB.
	3.	Discharge rainwater to a surface water sewer/drain, highway drain or another drainage system	X	No public or private sewerage assets are understood to serve the site address.
	4.	Discharge rainwater to Combined Sewer	X	No public or private sewerage assets are understood to serve the site address.

- 6.17. On review of the SuDS drainage hierarchy, and with reference to both national and local policy, surface water generated from the proposed development could be managed on site via a attenuation pond area located to the west of the proposed primary substation. A filter drain/swale is proposed to convey flows to the attenuation pond area and provide treatment.
- 6.18. The outfall associated with the proposed attenuation pond area is to be fitted with a protected 30mm diameter orifice plate to limit final outflows to no more than 1.0 L/s.
- 6.19. It should be noted that guidance from the CIRIA SuDS manual states the following in relation to orifice plate design;

Orifice diameters as small as 15 mm can be acceptable provided that the opening is well protected from material that could potentially cause a blockage (e.g. by placing the orifice downstream of pervious surfaces or a suitable, cleanable filter).

6.20. As such, the orifice plate is proposed at the outfall location of the attenuation pond area within a gabion stone basket surrounding it which should provide adequate protection to stop potential blockages. It is recommended that a geotextile filter layer also surrounds the gabion basket to remove any fine debris.

6.21. The proposed Surface Water Drainage Layout is included as Appendix C.

InfoDrainage Modelling Results

6.22. A simplified surface water drainage model was built in InfoDrainage software (v 2025.2) which comprised of:

- 4no. contributing catchment areas across the proposed impermeable areas and existing roof catchment. An additional 10% allowance for urban creep has been included in the calculations, this represents a conservative approach whereby an allowance is made for the conversion of permeable areas to impermeable areas over the lifetime of the development;
- 1no. filter drain/swale for conveyance (top width: 1.20m, depth: 0.30m, long slope: 1 in 200), and;
- 1no. attenuation pond (EL: 2.40m AOD, ponding depth: 300mm, top area: 210.0m², filtration layer depth: 0.30m, filtration layer porosity: 30%, total storage volume: 72.47m³).

6.23. The full calculation outputs can be found in Appendix D of this report although the 1 in 100 year +40% climate change results have been summarised below:

- The maximum flow rate to the existing ditch network would be 1.0 l/s for the critical storm event (960 minute summer).
- The maximum depths in the proposed 0.60m deep attenuation pond area would be 0.589m for the critical storm event (960 min summer).
- No flooding is observed in the critical storm event based on the InfoDrainage model.

6.24. As such, these results indicate that the runoff from the proposed development could be accommodated within a drainage system of the approximate size modelled.

Maintenance

- 6.25. Table 5 and Table 6 presents details regarding the maintenance requirements for the proposed SuDS included as part of the development, taken from the CIRIA C753 SuDS manual. All SuDS will be privately maintained. Each manufacturer will have bespoke requirements however the below should be used as a guide:

Table 5: Maintenance for Swales/Filter Drains

Maintenance Schedule	Required Action	Typical Frequency
Regular Maintenance	Remove litter and debris	Monthly (or as required)
	Cut the grass – public areas	Monthly (during growing season)
	Cut the meadow grass	Half yearly (spring, before nesting season, and autumn)
	Inspect marginal and bankside vegetation and remove nuisance plants (for first 3 years)	Monthly (at start, then as required)
	Inspect inlets, outlets, banksides, structures, pipework etc. for evidence of blockage and/or physical damage	Monthly
	Inspect water body for signs of poor water quality	Monthly (May – October)
	Inspect silt accumulation rates in any forebay and in main body of the pond and establish appropriate removal frequencies; undertake contamination testing once some build-up has occurred, to inform management and disposal options	Half yearly
	Check any mechanical devices e.g., Penstocks	Half yearly
	Hand cut submerged and emergent aquatic plants (at minimum of 0.1m above pond base; include max 25% of pond surface)	Annually
	Tidy all dead growth (scrub clearance) before start of growing season (Note: tree maintenance is usually part of overall landscape management contract)	Annually
Regular Maintenance	Remove sediment from any forebay	Every 1-5 years, or as required
	Remove sediment and planting from one quadrant of the main body of ponds without sediment forebays	Every 5 years, or as required
Occasional Maintenance	Remove sediment from the main body of big ponds when pool volume is reduced by 20%	With effective pre-treatment this will only be required rarely. E.g., every 25-50 years

Maintenance Schedule	Required Action	Typical Frequency
Remedial Actions	Repair erosion or other damage	As required
	Replant, where necessary	As required
	Aerate pond when signs of eutrophication are detected	As required
	Realign rip-rap or repair other damage	As required
	Repair/rehabilitate inlets, outlets and overflows	As required

Table 6: Maintenance Requirements for Bioretention Systems (attenuation pond)

Maintenance Schedule	Required Action	Typical Frequency
Regular Inspections	Inspect infiltration surfaces for silting and ponding, record de-watering time of the facility and assess standing water levels in underdrain (if appropriate) to determine if maintenance is necessary	Quarterly
	Check operation of underdrains by inspection of flows after rain	Annually
	Assess plants for disease infection, poor growth, invasive species etc. and replace as necessary	Quarterly
	Inspect inlets and outlets for blockage	Quarterly
Regular Maintenance	Remove litter and surface debris and weeds	Quarterly (or as required)
	Replace any plants, to maintain planting density	As required
	Remove sediment, litter and debris build-up from around inlets or from forebays	Quarterly to biannually
Occasional Maintenance	Infill any holes or scour in the filter medium, improve erosion protection if required	As required
	Repair minor accumulations of silt by raking away surface mulch, scarifying surface of medium and replacing mulch	As required
Remedial Actions	Remove and replace filter medium and vegetation above	As required but likely to be > 20 years

6.26. Maintenance of the surface water drainage infrastructure within the bounds of the site curtilage should be the responsibility of the site owner or maintenance company appointed by the owner.

Designing for Exceedance

- 6.27. Periods of exceedance occur when the rate of surface water runoff exceeds the drainage system capacity. Conveyance beneath ground cannot, generally, be economically or sustainably constructed to the scale required for the most extreme rainfall events. This may result, on occasion, in the surface water runoff exceeding the capacity of the drainage network, with excess water (exceedance flow) being conveyed above ground.
- 6.28. For situations where extreme rainfall intensity exceeds inlet capacities, or for extreme storm events exceeding the design flood event considered for drainage design, surface water would flow toward the west of the site toward the drain network which flows around the perimeter of the site.
- 6.29. It is recommended to lay any hardstanding areas surrounding the proposed pro-shop extension such that the ground levels fall away from entry thresholds/external entry points, to minimise the chance of internal flooding.

Water Quality

- 6.30. A key element of SuDS is that they have the potential to improve the quality of surface water discharged from a site. In order to assess this, the "Pollution hazard indices for different land use classifications", provided in the CIRIA SuDS Manual (C753) as table 26.2, has been reviewed (Table 7). The indices use four different methods of assessing pollution potential based on the hazard level, total suspended solids (TSS), Metals, and Hydrocarbons.
- 6.31. The Mitigation Hazard Indices are summarised in Table 8 below (with reference to table 26.3 in the CIRIA SuDS manual).

Table 7: Pollutant Hazard Indices

Land Use	Pollution Hazard Level	Total Suspended Solids (TSS)	Metals	Hydrocarbons
Other roofs (typically commercial/ industrial roofs)	Low	0.3	0.2 (up to 0.8 where there is potential for metals to leach from the roof)	0.05
Low traffic roads	Low	0.5	0.4	0.4

(eg cul de sacs, homezones and general access roads)				
--	--	--	--	--

Table 8: Mitigation Hazard Indices.

SuDS	Total Suspended Solids (TSS)	Metals	Hydrocarbons
Filter Drain	0.4	0.4	0.4
Bioretention System (attenuation pond)	0.8	0.8	0.8

- 6.32. Runoff from commercial roofs is generally considered low contamination risk and does not usually warrant any significant treatment. However, given the use of the filter drain and attenuation pond will provide sufficient mitigation to negate debris build-up in the below-ground network.
- 6.33. The mitigation indices offered by the proposed attenuation pond will be sufficient to manage any pollution from the proposed roof areas. It is therefore considered that the proposed SuDS features are appropriate and acceptable in terms of water quality.

Management During Construction

Visual Inspection/Sweep

- 6.34. This should include a systematic review of the drainage infrastructure. Each element should be inspected to determine if remedial actions are needed. Where access chambers are provided, these should be used to access below ground infrastructure:
- Rodding eyes / inspection chambers are provided at both ends of all perforated pipes; these should be used to determine the level of silt within the system.
 - Non-man entry inspection chambers are provided for the geo-cellular structure.
 - Permeable paving should be inspected for vegetation / defects (rocking blocks), it should be swept clear of debris.

Surface Water Management During Construction

- 6.35. The surface water runoff generated during construction has the potential to have higher concentration of oils and sediments from heavy machinery and earthworks respectively. As such,

it is necessary to devise appropriate surface water management plans tailored to specific construction activities and receptors of runoff. Specific considerations are:

- Provision of appropriate bunding/containment for potentially hazardous materials or chemicals.
- Re-fuelling of plant and equipment to take place only within designated areas, with suitable pollution containment.
- Good housekeeping on site to prevent accidental spillages, and spill kits to be provided as appropriate.
- Vehicle wash down areas / wheel cleaning to be located in areas with appropriate pollution control measures.
- If water/spray dust suppression is needed, the run-off should be directed to a temporary containment area and should not be allowed to discharge to the public sewer / infiltration devices.
- The installed surface water drainage network should be routinely inspected during construction, especially the infiltration devices; and,

Suitable protection measures should be in place during construction to protect the watercourse and groundwater resources.

7. Conclusions

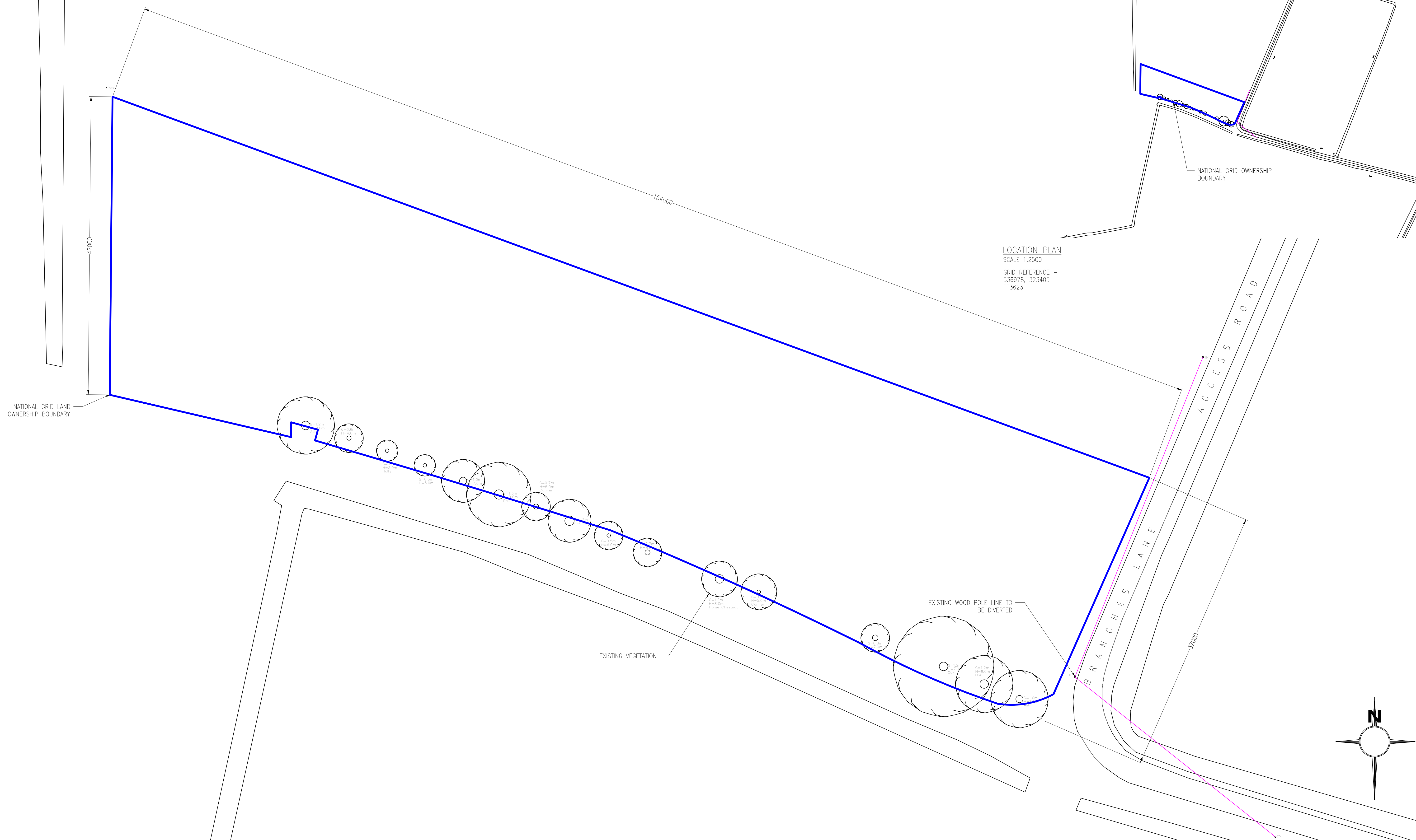
- 7.1. This FRA and SWDS has been undertaken with reference to the requirements of NPPF and Planning Practice Guidance with respect to the development at Land at Branches Lane, South Holland, Lincolnshire, PE12 8PD. It has been written to support a planning application and prepared with due consideration to the nature of the proposed development to provide the appropriate level of detail.
- 7.2. An assessment of the risk of flooding from all sources has been undertaken and is summarised in the table below:

Source of Flooding	Flood Risk Summary
Tidal	Based on this assessment, the present day (defended) tidal flood risk is considered to be low. In the event of a breach of the existing defences in the 2115 epoch there is a residual risk of flooding and as such mitigation measures are recommended.
Pluvial Fluvial Reservoirs Groundwater Sewers Canals	The site is considered to be at low risk from other sources.

- 7.3. The FRA supports the planning application and demonstrates that there is an acceptable level of flood risk to the site if the mitigation strategies recommended are implemented in the scheme. The development does not increase flood risk off site or to the wider area.
- 7.4. On review of the SuDS drainage hierarchy, and with reference to both national and local policy, surface water generated from the proposed development could be managed on site via a attenuation pond area located to the west of the proposed primary substation. A filter drain/swale is proposed to convey flows to the attenuation pond and provide treatment.
- 7.5. The outfall associated with the proposed attenuation pond area is to be fitted with a protected 30mm diameter orifice plate to limit final outflows to no more than 1.0 L/s.

- 7.6. The 1 in 100 year +40% climate change results have been summarised below:
- The maximum flow rate to the existing ditch network would be 1.0 l/s for the critical storm event (960 minute summer).
 - The maximum depths in the proposed 0.60m deep attenuation pond area would be 0.589m for the critical storm event (960 min summer).
 - No flooding is observed in the critical storm event based on the InfoDrainage model.
- 7.7. As such, these results indicate that the runoff from the proposed development could be accommodated within a drainage system of the approximate size modelled.
- 7.8. Consultation from the IDB is recommended given the proposed surface water drainage connection to the adjacent ditch network and the proximity the proposed development to the surrounding drains.
- 7.9. This Flood Risk Assessment and Surface Water Drainage Strategy should be submitted as part of the planning application to satisfy the requirements under NPPF.

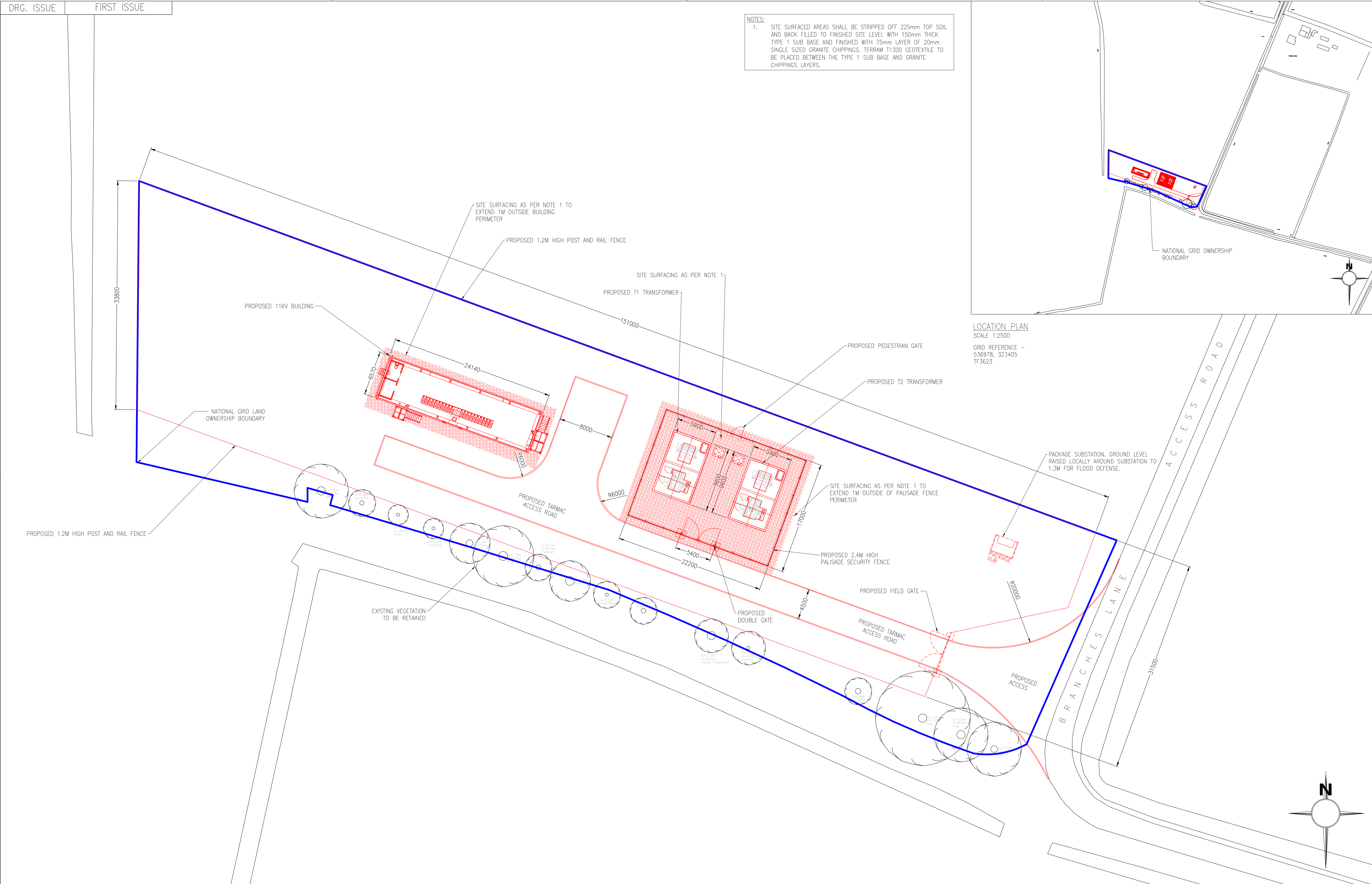
Appendix A - Development Proposals



EXISTING SITE PLAN
SCALE 1:250

							nationalgrid  Electricity Distribution		Engineering Design Department (East Midlands) Pegasus Business Park, Castle Donington, DE74 2TU.			
C	SM	JS	CH	23.09.24	FOR INFORMATION		Title: <u>HOLBEACH SOUTH 33/11kV SUBSTATION</u> PLANNING EXISTING SITE LAYOUT			Scale: AS SHOWN @ A1	Drg. No. LN113_12_0001	Rev No. C
B	SM	JS	CH	23.07.24	FOR INFORMATION							
A	SM	JS	CH	27.06.24	FOR INFORMATION							
Rev	Drawn	Chk'd	App'd	Date	Revision Note							

NOTES:
1. SITE SURFACED AREAS SHALL BE STRIPPED OFF 225mm TOP SOIL AND BACK FILLED TO FINISHED SITE LEVEL WITH 150mm THICK TYPE 1 SUB BASE AND FINISHED WITH 75mm LAYER OF 20mm SINGLE SIZED GRANITE CHIPPINGS. TERRAM T1300 GEOTEXTILE TO BE PLACED BETWEEN THE TYPE 1 SUB BASE AND GRANITE CHIPPINGS LAYERS.



PROPOSED SITE PLAN
SCALE 1:250

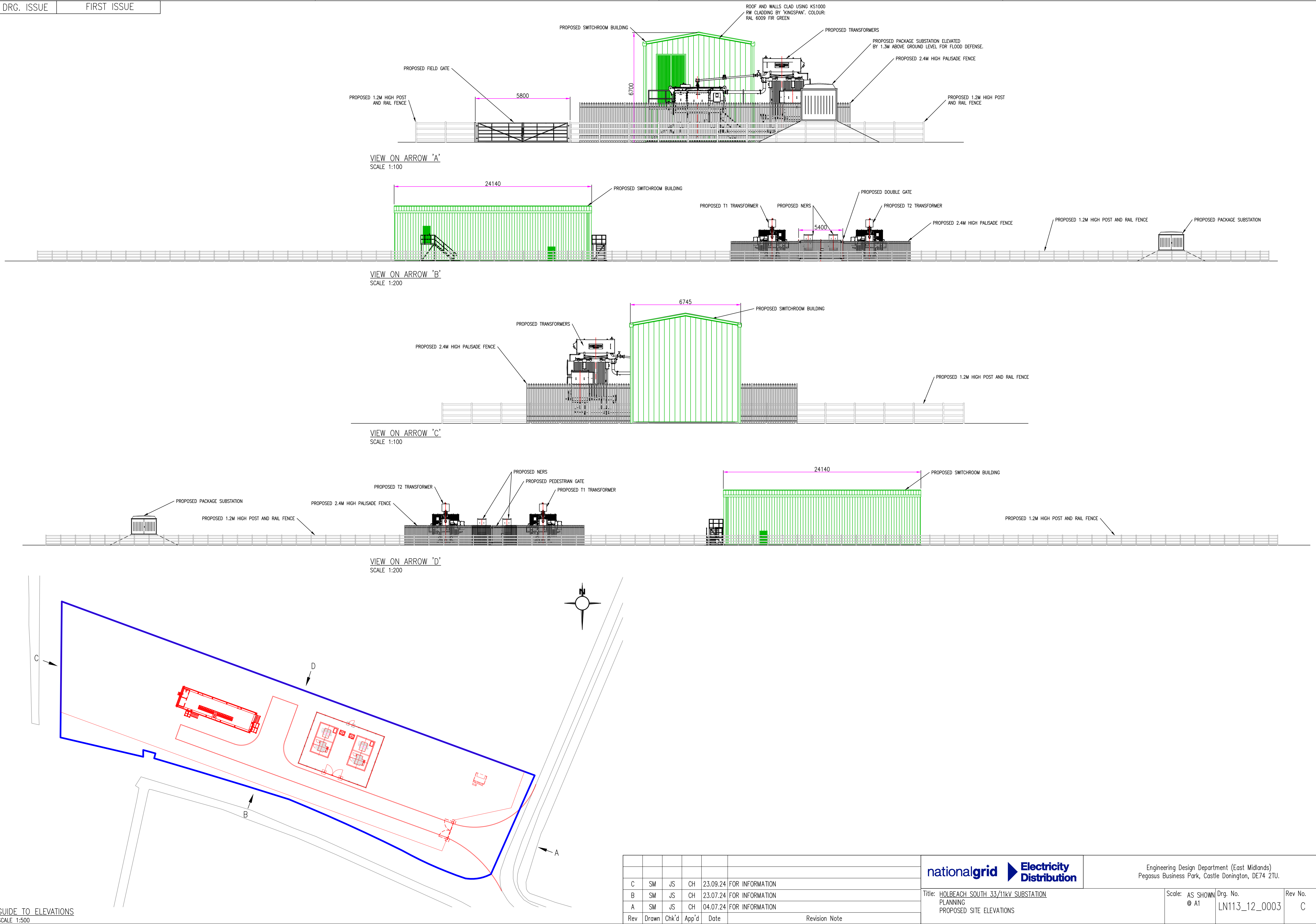
D	SM	JS	CH	23.09.24	UPDATED LAND OWNERSHIP BOUNDARY
C	SM	JS	CH	23.07.24	UPDATED INFORMATION
B	JS	BC	CH	09.07.24	FOR INFORMATION
A	SM	JS	CH	27.06.24	FOR INFORMATION
Rev	Drawn	Chk'd	App'd	Date	Revision Note

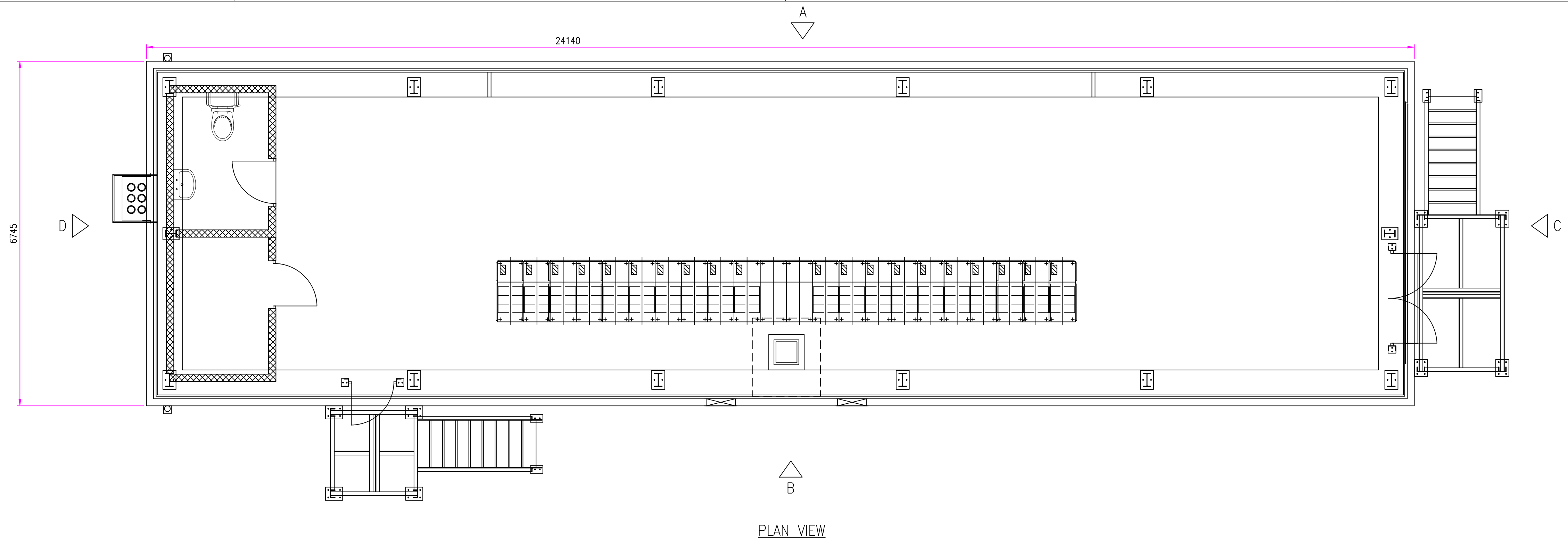


Title: HOLBEACH SOUTH 33/11kV SUBSTATION
PLANNING
PROPOSED SITE LAYOUT

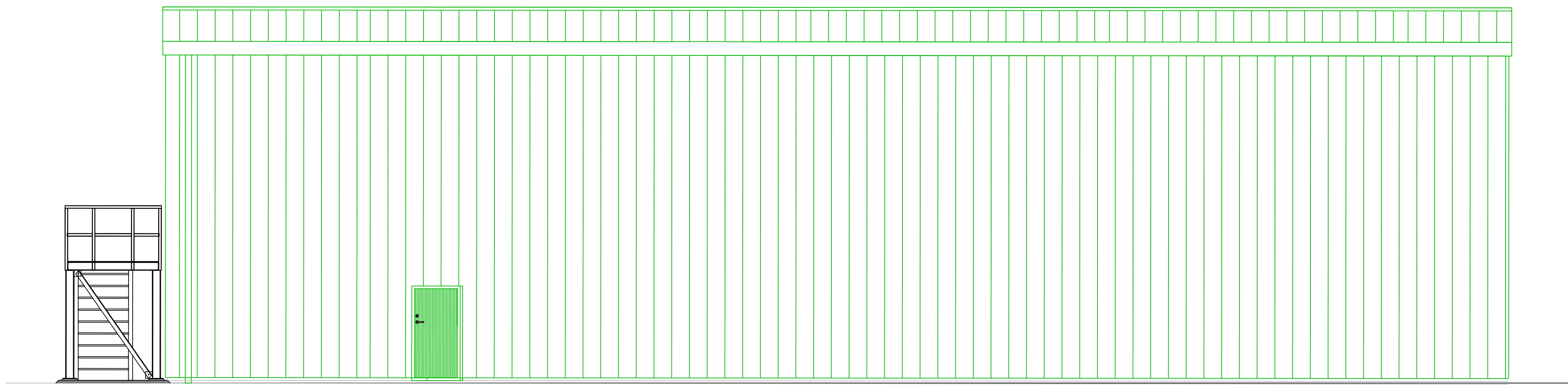
Engineering Design Department (East Midlands)
Pegasus Business Park, Castle Donington, DE74 2TU.

Scale: AS SHOWN @ A1	Drg. No. LN113_12_0002	Rev No. D
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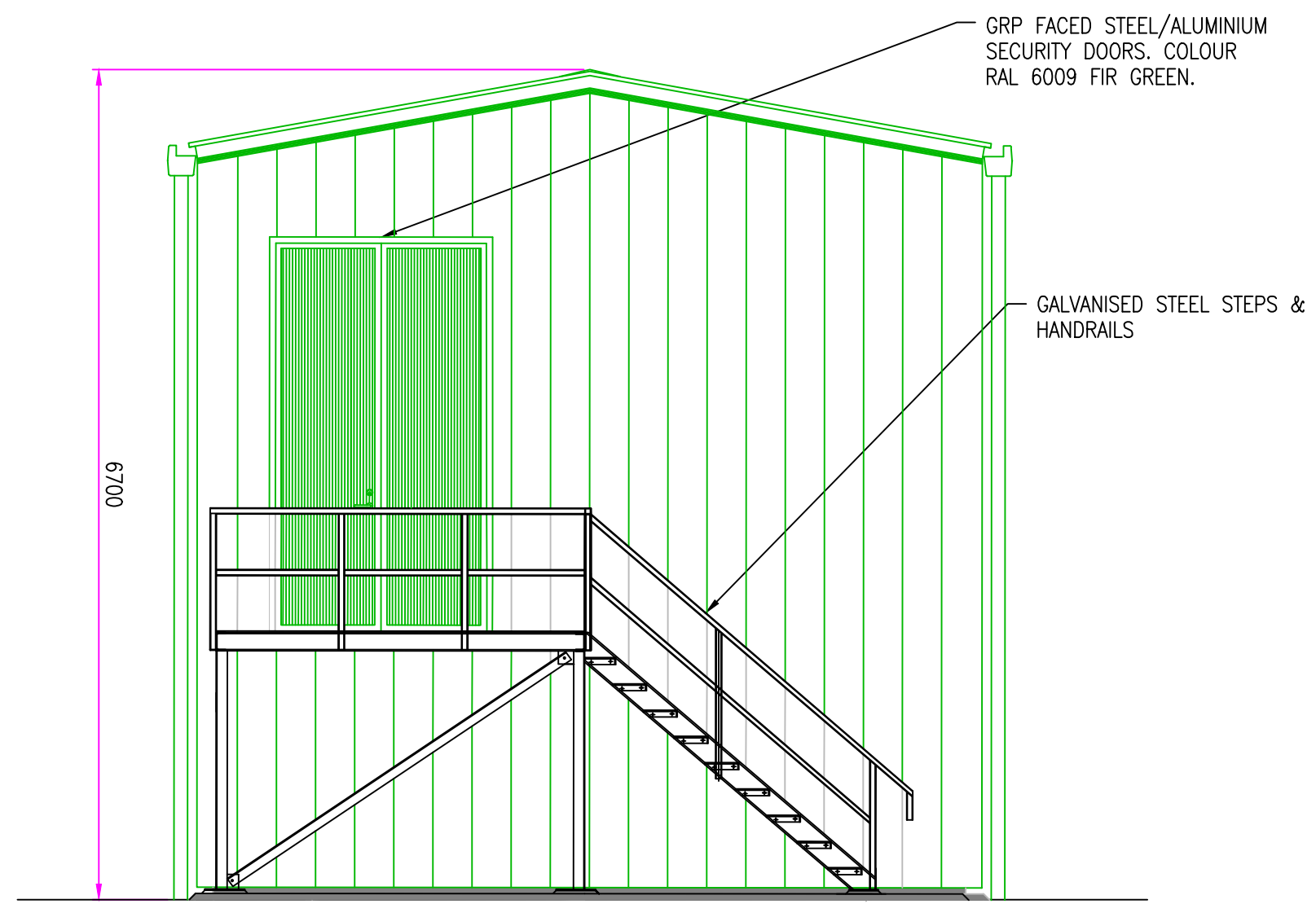




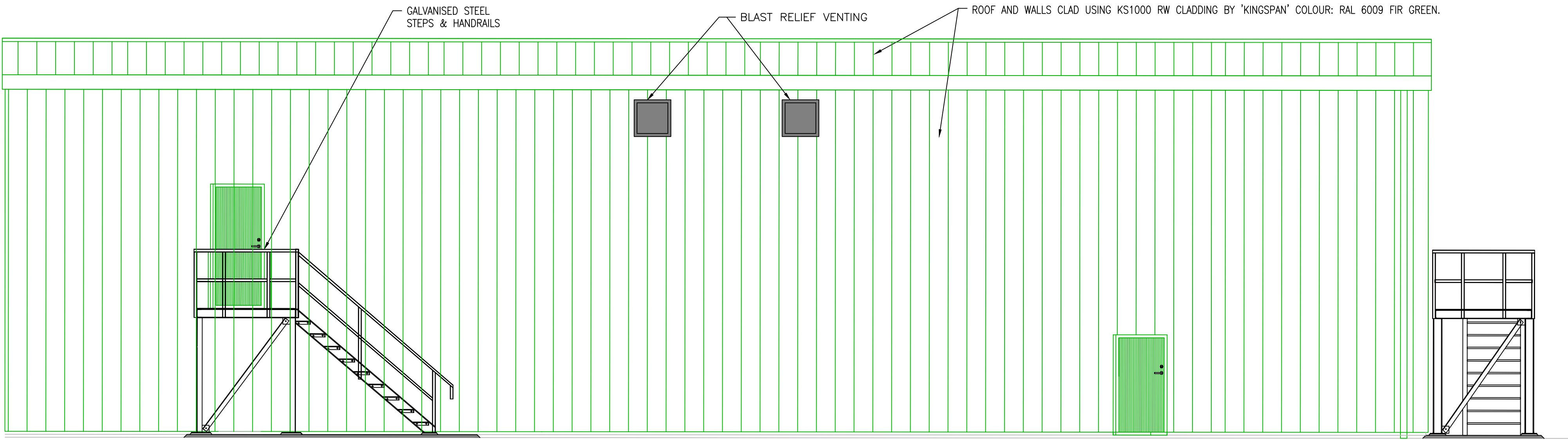
PLAN VIEW



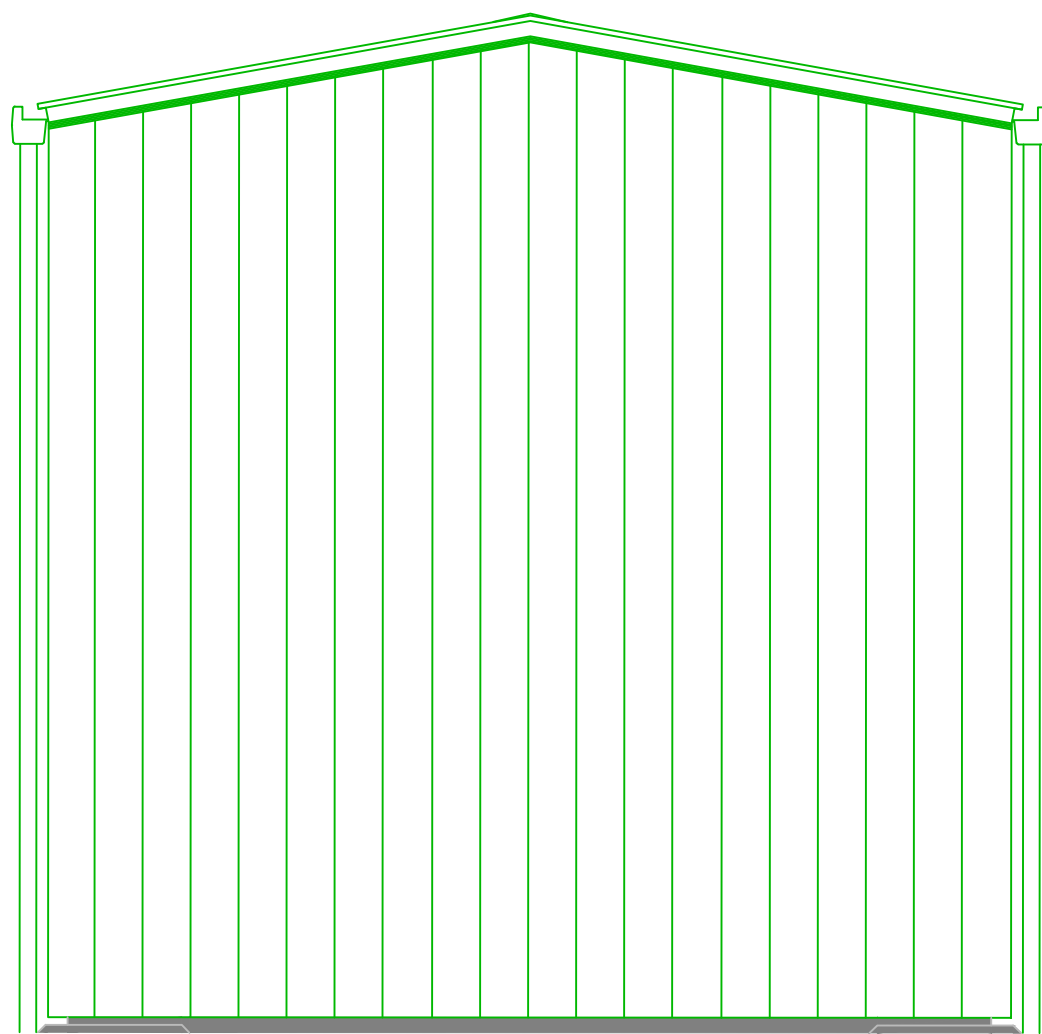
ELEVATION A (NORTH)



ELEVATION C (EAST)



ELEVATION B (SOUTH)



ELEVATION D (WEST)

						nationalgrid Electricity Distribution		Engineering Design Department (East Midlands) Pegasus Business Park, Castle Donington, DE74 2TU.		
						Title: HOLBEACH SOUTH 33/11KV SUBSTATION PLANNING PROPOSED 11KV BUILDING PLAN & ELEVATIONS		Scale: 1:50 @A1	Drg. No. LN113_12_0004	Rev No. A
A	SM	JS	CH	23.09.24	FOR INFORMATION					
Rev	Drawn	Chk'd	App'd	Date	Revision Note					

Appendix B - EA Product Data

Lisa Slater
lisa@aegaea.com

Your ref: 1940
Our ref: CCN-2023-295545
Date: 24/01/2023

Dear Lisa,

Provision of Flood Risk Information for Branches Lane, South Holland

Thank you for your request for our flood risk information for the above site. The information is set out below and attached. It is important you read any contextual notes on the maps provided.

If you are preparing a Flood Risk Assessment (FRA) for this site, please note this information may not be sufficient by itself to produce an adequate FRA to demonstrate the development is safe over its lifetime. Additional information may be required to carry out an appropriate assessment of all risk, such as consequence of a breach in defences.

We aim to review our information on a regular basis, so if you are using this data more than twelve months from the date of this letter, please contact us again to check it is still valid.

Please read the letter in full as the information covered has been updated in **January 2023**.

1. Flood Map

The attached map includes the current Flood Map for your area. The Flood Map indicates the area at risk of flooding, **assuming no flood defences exist**, for a flood 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 with a 0.1% chance of occurring in any year, or the highest recorded historic extent if greater.

In some locations, such as around the fens and the large coastal floodplains, showing the area at risk of flooding assuming no defences may give a slightly misleading picture in that if there were no flood defences, water would spread out across these large floodplains. This flooding could cover large areas of land but to relatively shallow depths and could leave pockets of locally slightly higher land as isolated dry islands. It is important to understand the actual risk of the flooding to these dry islands, particularly in the event of defence failure.

The Flood Map also shows the location of formal raised flood defences and flood storage reservoirs. It represents areas at risk of flooding for present day only and does not take account of climate change.

The Flood Map only indicates the extent and likelihood of flooding from rivers or the sea. It should also be remembered flooding may occur from other sources such as surface water sewers, road drainage, etc.

2. Historic Flood Event Outlines

With regards to the history of flooding I can advise we do not have any records of flooding in this area. It is possible recent flooding may have occurred which we are currently investigating, therefore this information may be subject to change. It is possible other flooding may have occurred which other risk management authorities, such as the Lead Local Flood Authority (ie top tier council) or Internal Drainage Board (where they exist) have responsibility.

3. Schemes in the area

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

4. Fluvial Flood Risk Information

This site is not considered to be at risk of flooding from main rivers.

The site may be at risk from local ordinary watercourses for which other risk management authorities, such as the Lead Local Flood Authority (ie top tier council) or Internal Drainage Board (where they exist) have responsibility.

5. Tidal Flood Risk Information

This site is considered to be at risk from tidal flooding.

5.1 Tidal Defence Information

The existing tidal defences protecting this site from the Tidal Welland consist of earth embankments. They are in fair condition and reduce the risk of flooding (at the defence) to a 1% (1 in 100) chance of occurring in any year.

The existing tidal defences protecting this site from the Tidal Nene 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 existing tidal defences protecting this site from the Wash 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.

We inspect these defences routinely to ensure potential defects are identified.

Refer to paragraph 3 for details of any ongoing capital projects to reduce the flood risk to this site.

5.2 Tidal Flood Levels

The attached data sheets show our current best estimate for extreme tide levels.

Please read the information notes on the data sheets.

5.3 Tidal Hazard Mapping

For certain locations we have carried out modelling to map the maximum values of flood depth, velocity and hazard rating (danger to people) resulting from overtopping and / or breaching of defences at specific locations for a number of scenarios.

At present this information is available along the full coastal / tidal floodplain, except the tidal Witham Haven in Boston (upstream of Hobhole) where only breaching and not overtopping has been modelled and the tidal River Welland upstream of Fosdyke Bridge where neither breaching nor overtopping are available.

The number of locations we have this information for is expected to increase in time.

The attached maps show the maximum values of flood depth, velocity and hazard rating (danger to people) resulting from breaching of the defences at specific locations for the scenarios below. For some locations the breach mapping also includes flooding from overtopping if this is expected in that scenario. The location of modelled tidal breaches is shown on a separate attached map.

5.3.1 Tidal Hazard Mapping – Breaches

- Year 2115 0.5% (1 in 200) chance
- Year 2115 0.1% (1 in 1000) chance

Your site is not affected by breaching of the tidal defences for the present day (2006) scenarios.

5.3.2 Tidal Hazard Mapping - Overtopping

Your site is not affected by overtopping of the defences for the present day (2006) and climate change (2115) scenarios, though may be at risk from breaching.

6. Development Planning

If you would like local guidance on preparing a flood risk assessment for a planning application, please contact our Sustainable Places team at LNplanning@environment-agency.gov.uk. It will help if you mention this data request and attach your site location plan.

We provide free preliminary advice; additional/detailed advice, review of draft FRAs and meetings are chargeable at a rate set to cover our costs, currently £100 (plus VAT) per hour of staff time. Further details are available on our website at

<https://www.gov.uk/guidance/developers-get-environmental-advice-on-your-planning-proposals>.

General advice on flood risk assessment for planning applications can be found on GOV.UK at <https://www.gov.uk/guidance/flood-risk-assessment-for-planning-applications>

Climate change will increase flood risk due to overtopping of defences. Please note, unless specified otherwise, the climate change data included has an allowance for 20% increase in flow. Updated guidance on how climate change could affect flood risk to new development - 'Flood risk assessments: climate change allowances' was published on GOV.UK in **July 2021**. The appropriate updated climate change allowance should be applied in a Flood Risk Assessment.

You should also consult the Strategic Flood Risk Assessment produced by your local planning authority.

7. Data Licence and Other Supporting Information

We respond to requests for recorded information we hold under the Freedom of Information Act 2000 (FOIA) and the associated Environmental Information Regulations 2004 (EIR).

This information is provided in accordance with the Open Government Licence which can be found here: <http://www.nationalarchives.gov.uk/doc/open-government-licence/version/3/>

Further information on flood risk can be found on the GOV.UK website at:
<https://www.gov.uk/browse/environment-countryside/flooding-extreme-weather>

8. Other Flood Risk Management Authorities

The information provided with this letter relates to flood risk from main river or the sea. Additional information may be available from other risk management authorities, such as the Lead Local Flood Authority (ie top tier council) or Internal Drainage Board (where they exist).

I hope we have correctly interpreted your request. If you have any queries or would like to discuss the content of this letter further please contact Alexander Tan using the email address below and quoting our CCN reference number above.

Yours sincerely,



Team dial: +442030253535

for Alastair Windler

Welland and Nene Partnerships and Strategic Overview Team Leader

e-mail PSOWN@environment-agency.gov.uk

Enc.

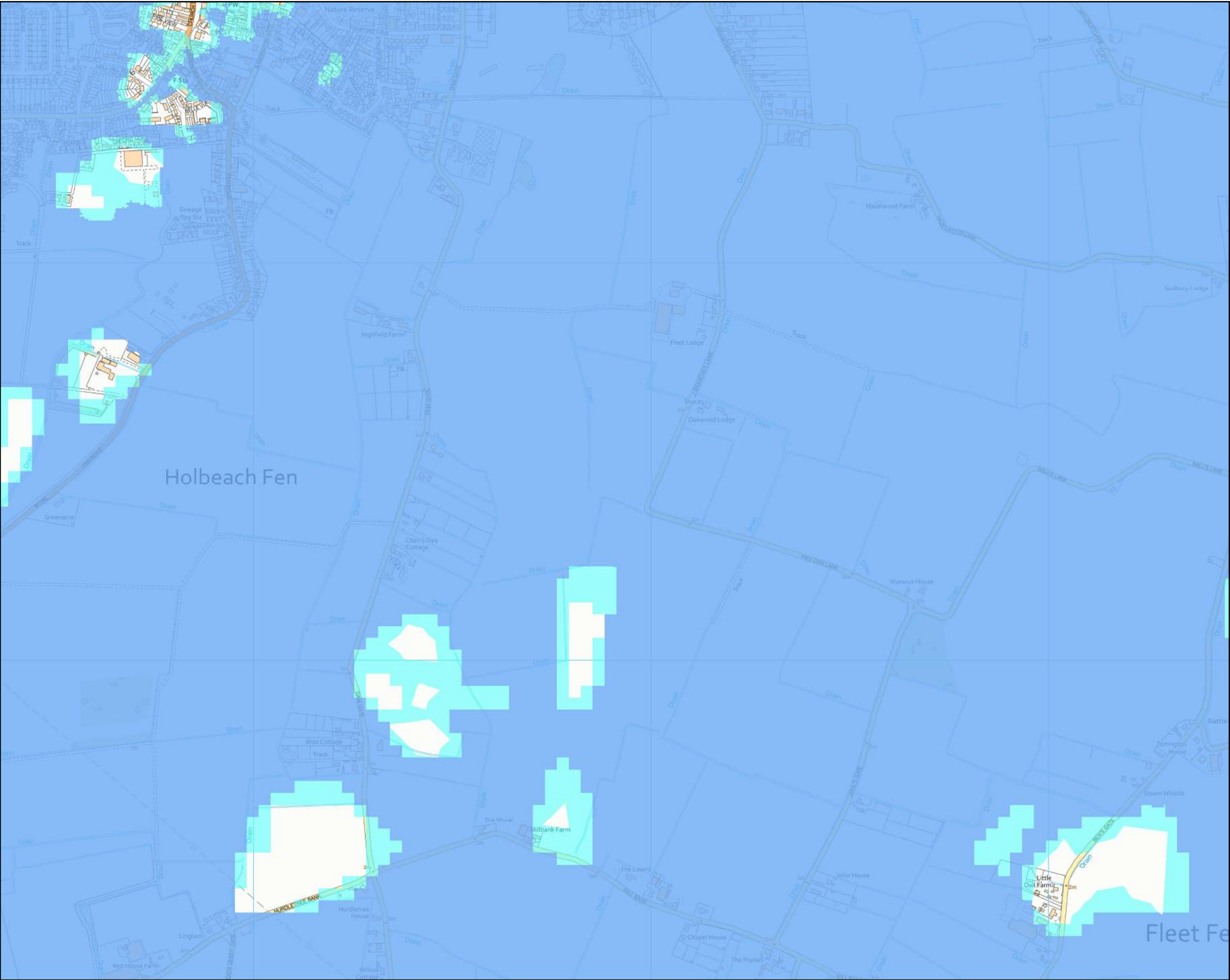
Flood Map

Tidal Level Data Sheets - Map and Tables

Tidal Breach Points – Locations Map

Hazard Mapping – Breaching

Flood Map centred on TF 36909 23426 - created January 2023 [Ref: CCN-2023-295545]



Scale 1:10,000



Legend

- Main Rivers
- Raised Defences
- Flood Storage Areas
- Areas at Risk of Flooding from Rivers or the Sea
- Extreme Flood Outline

Dark blue shows the area that could be affected by flooding, either from rivers or the sea, if there were no flood defences. This area could be flooded:

- from the sea by a flood that has a 0.5% (1 in 200) or greater chance of happening each year.
- or from a river by a flood that has a 1% (1 in 100) or greater chance of happening each year.

Light blue 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.

These two colours show the extent of the natural floodplain if there were no flood defences or certain other manmade structures and channel improvements. Sites outside the two extents, but behind raised defences, may be affected by flooding if the defences are overtopped or fail.

Created by the Partnerships and Strategic Overview Team, Kettering

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

Key Node Points



Scale 1:550,000



▲ East Coast and Wash

See seperate 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%	2.5%	50%
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	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://deframetadadata.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://deframetadadata.com/geonetwork/srv/eng/catalog.search#/metadata/84a5c7c0-d465-11e4-b0bd-f0def148f590>



★ **Modelled Breach Locations**

0 3.5 7 14 Kilometers

This map indicates the location of where we have modelled the consequence of breaches in the defences along the coastline and tidal rivers. We have mapped the maximum values of Hazard Rating (Danger to People), Depth and Velocity.

We have not assumed that all breaches occur at the same time, but have modelled each breach individually and overlaid the results to find the maximum values.

Our modelling only considers the consequences of a breach, it does not make any assumption about the likelihood of a breach occurring. Our defences generally provide a good standard of flood defence but a risk of breaching remains.

Please contact the Environment Agency for information on how these maps are used in the management of flood risk.

General Enquiries No: 03708 506 506.

Weekday calls cost 5p plus up to 6ppm from BT Weekend Unlimited. Mobile and other providers charges may vary.

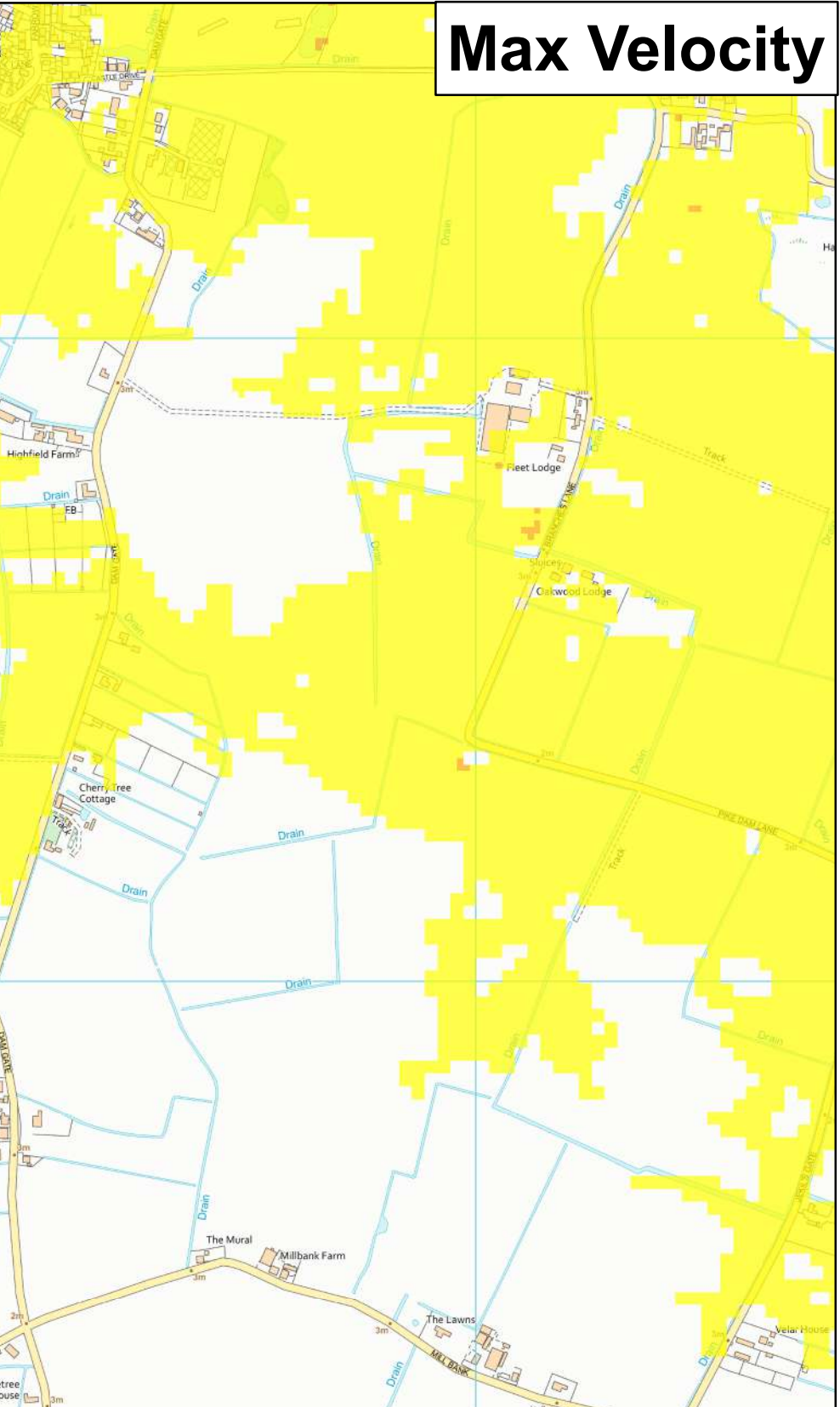
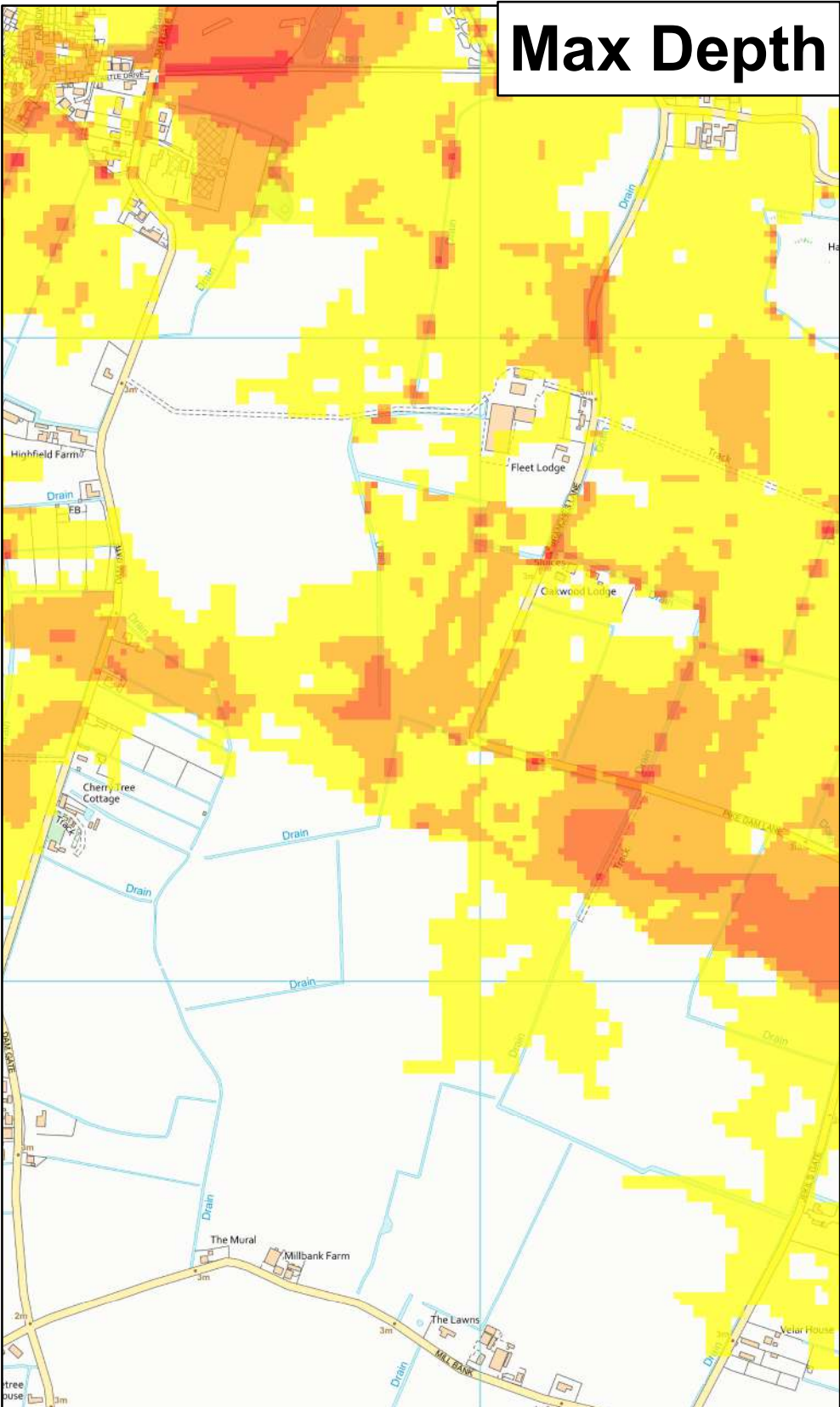
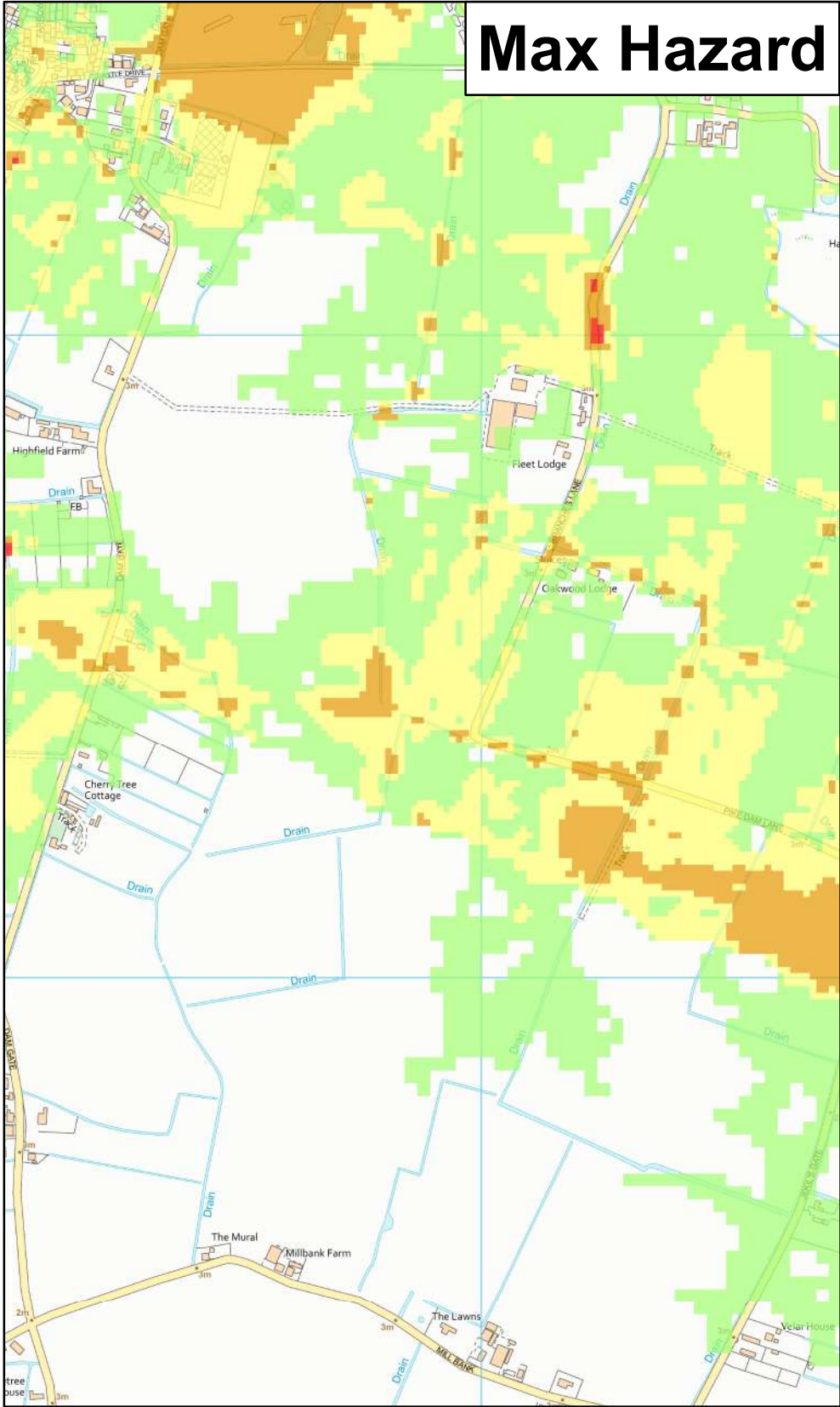


Produced by the Partnership and Strategic Overview Team, Lincoln
General Enquiries No: 03708 506 506

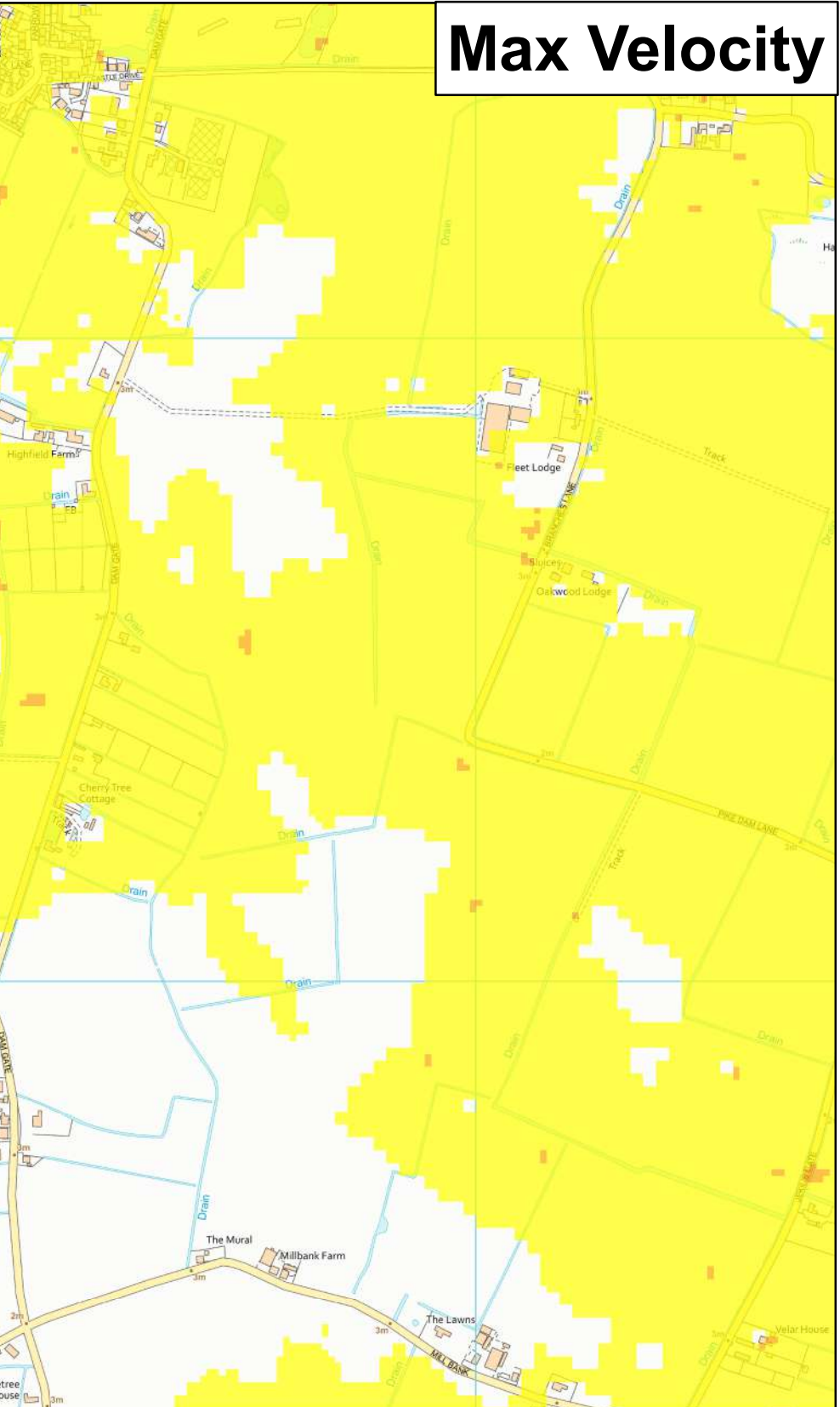
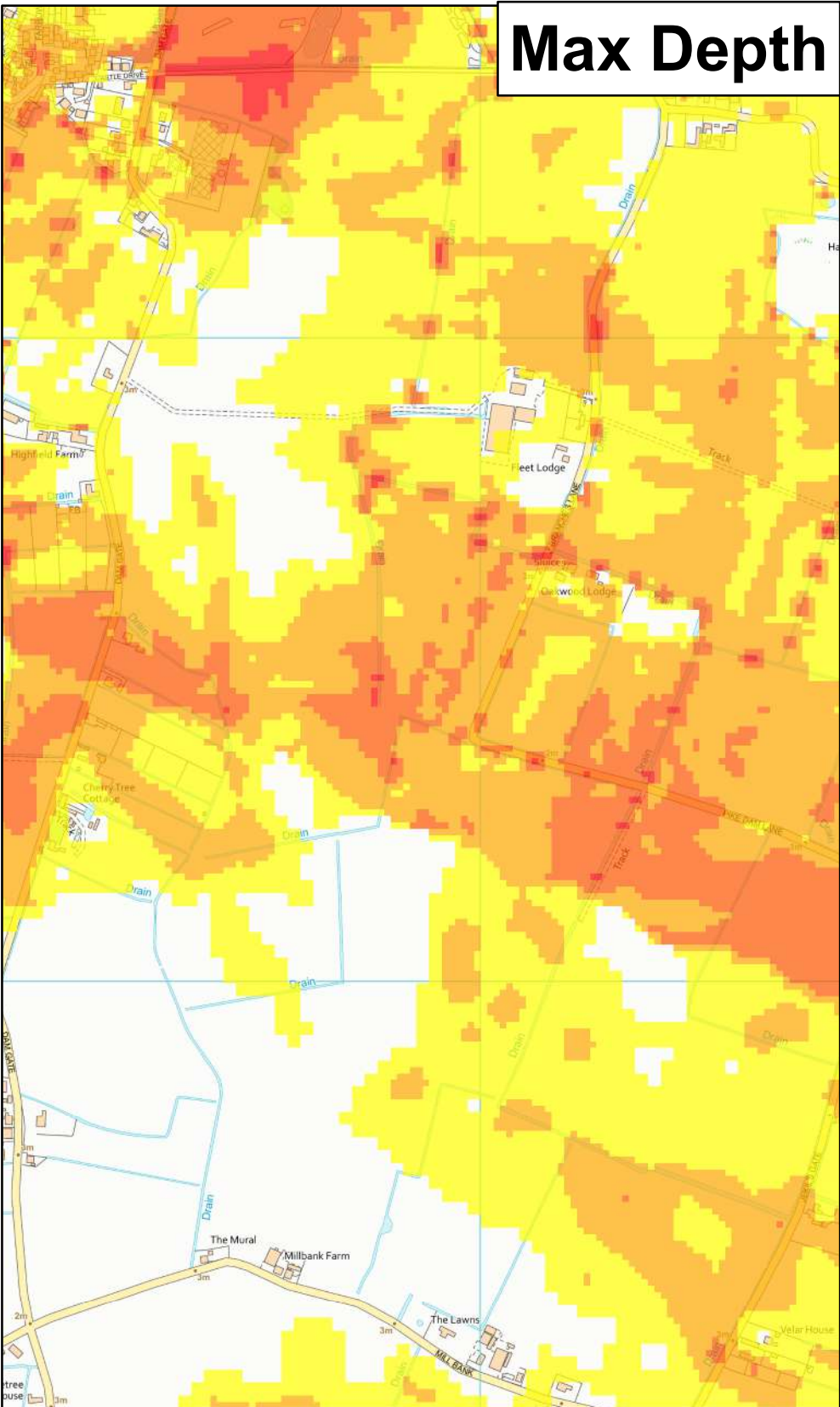
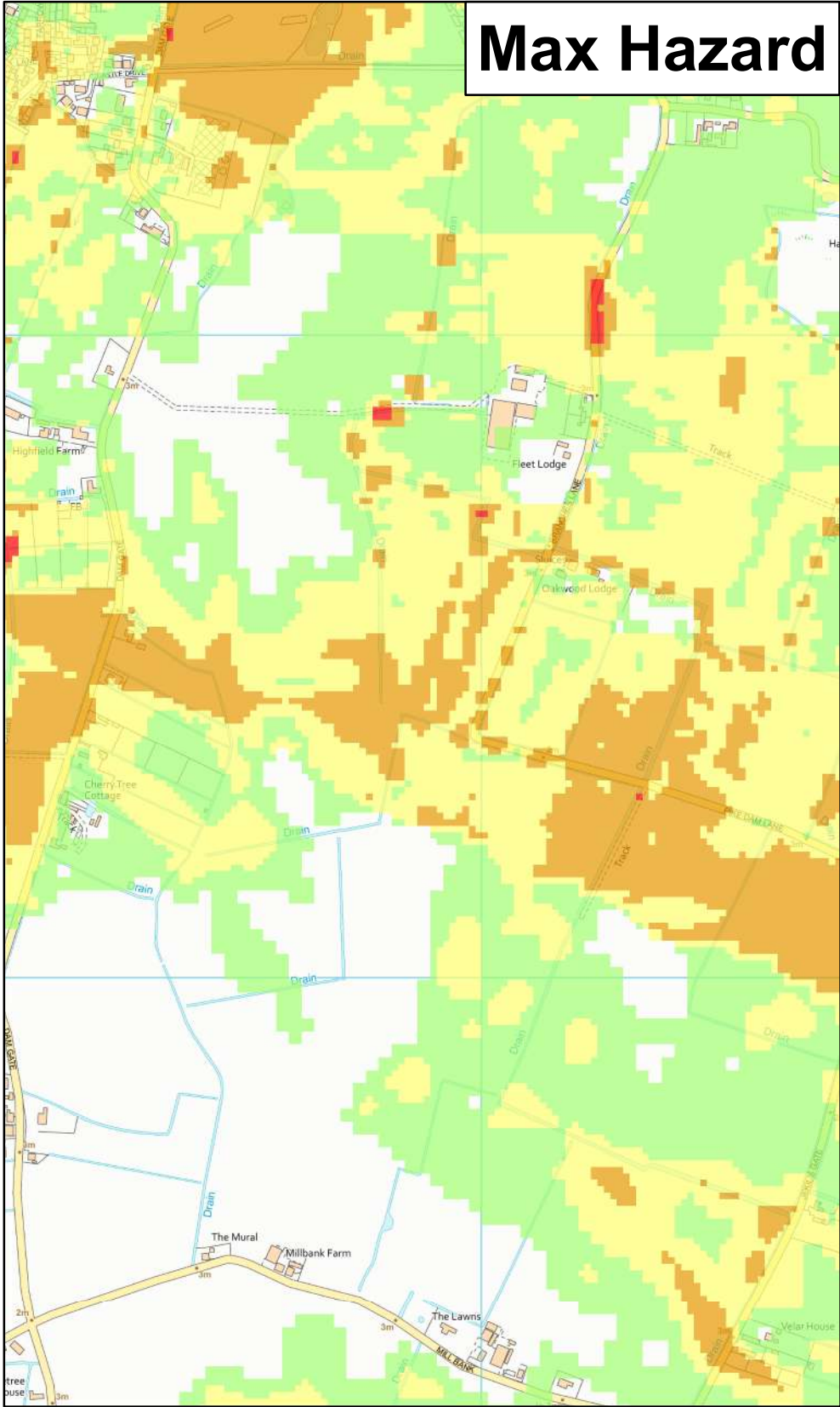
Northern Area Tidal Hazard Mapping

Location of Modelled Breaches

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Unauthorised reproduction infringes Crown copyright and may lead to prosecution or civil proceedings.



★ Modelled Breach Locations - see also the accompanying plan "Location of Modelled Breaches"								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
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	January 2023	Scenario year	2115	Scenario Annual Chance	0.5% (1 in 200)	CCN Number	CCN-2023-295545	
								
								Lincolnshire and Northamptonshire Tidal Breaching Hazard Mapping
								Map Centred on TF 36909 23426
								1:10,000 © Environment Agency copyright and/or database rights 2023. © Crown copyright and database rights 2023 Ordnance Survey 100024198.



★ Modelled Breach Locations - see also the accompanying plan "Location of Modelled Breaches"								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	Max Hazard (Flood Risk to People : FD2320)		Max Depth (m)		Max Velocity (m/s)	
Less than 0.75 (Low Hazard) Between 0.75 and 1.25 (Danger for Some) Between 1.25 and 2.0 (Danger for Most) Greater than 2.0 (Danger for All)		0 - 0.25 0.25 - 0.50 0.50 - 1.0 1.0 - 1.6 1.6 +		0 - 0.3 0.3 - 1.0 1.0 - 1.5 1.5 - 2.5 2.5 +										
Date Printed	January 2023	Scenario year	2115	Scenario Annual Chance	0.1% (1 in 1000)	CCN Number	CCN-2023-295545							

Lincolnshire and Northamptonshire Tidal Breaching Hazard Mapping

Map Centred on TF 36909 23426

1:10,000

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Appendix C - Surface Water Drainage Strategy Layout



DO NOT SCALE THIS DRAWING. USE FIGURED DIMENSIONS ON SITE.
THE CONTRACTOR MUST CHECK & VERIFY ALL DIMENSIONS ON SITE.
ANY DISCREPANCIES MUST BE REPORTED IMMEDIATELY TO THE ENGINEER
FOR CLARIFICATION BEFORE PROCEEDING.
THIS DRAWING IS COPYRIGHT AND OWNED BY AEGAEA.

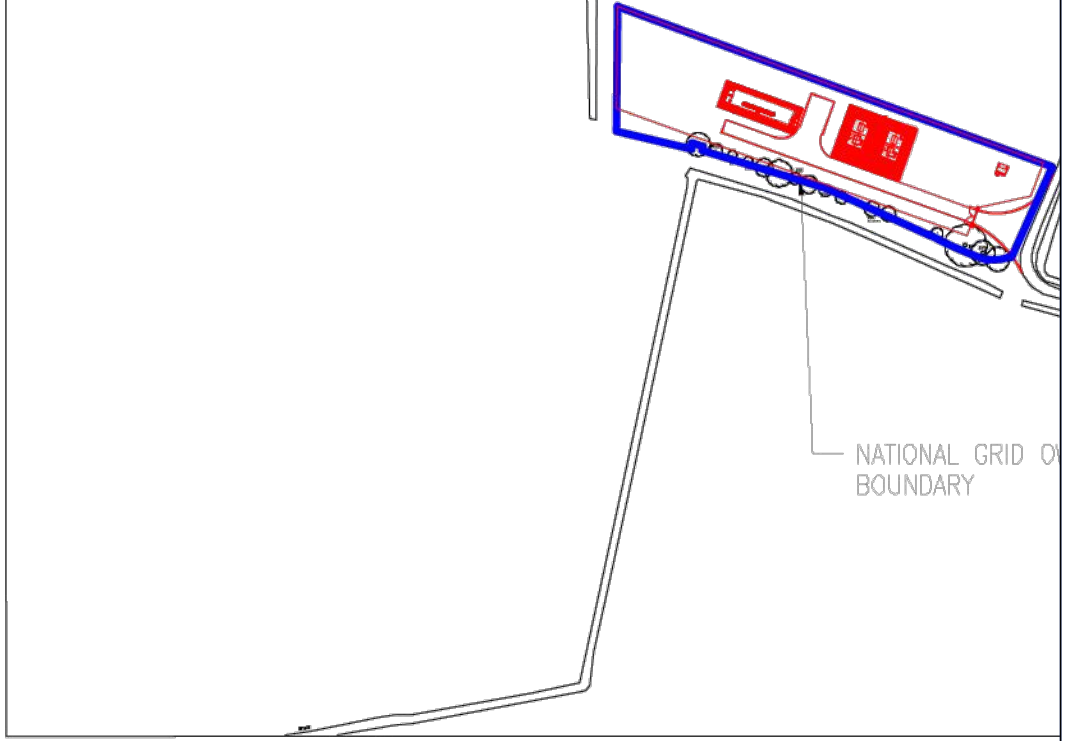
SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION
REFER TO THE RELEVANT CONSTRUCTION (DESIGN AND MANAGEMENT)
DOCUMENTATION WHERE APPLICABLE.
IT IS ASSUMED THAT ALL WORKS ON THIS DRAWING WILL BE CARRIED OUT BY
A COMPETENT CONTRACTOR, WORKING WHERE APPROPRIATE TO AN
APPROVED METHOD STATEMENT.

GENERAL NOTES:

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT REPORTS, PLANS AND ARCHITECTURAL DRAWINGS.
2. THIS DRAWING SHOULD NOT BE SCALED. THERE SHOULD BE NO RELIANCE ON THIS DRAWING WITH REGARDS TO DIMENSIONS. ALL DIMENSIONS SHOULD BE CONFIRMED ON SITE.
3. ANY DISCREPANCY ON THIS DRAWING SHOULD BE REPORTED TO AEGAEA IMMEDIATELY FOR CLARIFICATION.
4. THE CONTRACTOR IS RESPONSIBLE FOR ALL WORKS AND FOR THE STABILITY, INSTALLATION AND HEALTH AND SAFETY OF THE WORKS.
5. AEGAEA HAVE PRODUCED THIS DRAWING BASED ON THE DRAWINGS AND INFORMATION PROVIDED BY THE CLIENT AVAILABLE AT THE TIME OF PRODUCTION. WE CANNOT ACCEPT RESPONSIBILITY FOR DISCREPANCIES RESULTING FROM NEW PLANS/ INFORMATION BEING ISSUED POST-ISSUE OF THIS DRAWING. THE CONTRACTOR SHOULD REVIEW THIS DRAWING IN LIGHT OF WIDER SITE INFORMATION SUCH AS CONTAMINATION, UTILITIES SURVEYS AND SITE INVESTIGATIONS.
6. IT IS THE RESPONSIBILITY OF THE PRINCIPLE CONTRACTOR TO MAKE THE DESIGNER AND CLIENT AWARE OF SITE-SPECIFIC RISKS AND HAZARDS THAT MAY AFFECT THE DRAWING AND SPECIFICATION.

LEGEND

- PROPOSED SURFACE WATER DRAIN
- FILTER DRAIN/SWALE
- ATTENUATION POND
- CATCHMENT AREAS
- RAINWATER PIPE
- EXCEEDANCE FLOW ROUTE
- PROTECTED ORIFICE OUTFALL



LOCATION PLAN
SCALE 1:2500

GRID REFERENCE -
536978, 323405
TF3623

FILTER DRAIN/SWALE
PROPOSED TO BE USED AS A
CONVEYANCE FEATURE AND TO
PROVIDE TREATMENT TO
SURFACE WATER GENERATED BY
THE IMPERMEABLE CATCHMENT
AREAS.

DEPTH: 0.20m
TOP WIDTH: 1.20m
LONG SLOPE: 1 in 200
RAISED LOCALLY AROUND SUBSTATION TO
1.3M FOR FLOOD DEFENSE.

DRAFT

A05	27.03.2025	REVISION DESCRIPTION	OM
Rev	Date	Description	By

Client
DALCOUR MACLAREN LTD

Project
**LAND AT BRANCHES LANE, SOUTH
HOLLAND, LINCOLNSHIRE, PE12 8PD**

Title
**SURFACE WATER DRAINAGE STRATEGY
LAYOUT**

Project No.	Drawing No.	Revision
AEG0931	DR01	A05

Drawn	Checked	Approved	Date	Scale @ A1
OM	DMC	OH	MAR 2025	1:250

Drawing Status
SURFACE WATER DRAINAGE STRATEGY

aegaea
water, civils and environment

ATTENUATION POND
EL: 2.40m AOD
IL: 1.80m AOD
TOP AREA: 210.0m²
SIDE SLOPE: 1 in 3
TOTAL STORAGE VOLUME: 72.47m³
PONDING AREA DEPTH: 0.30m
FILTRATION LAYER DEPTH: 0.30m
FILTRATION LAYER POROSITY: 30%

100mm Ø PERFORATED UNDER
DRAIN PROPOSED WITH A
PROTECTED 30mm Ø ORIFICE
PLATE AT THE OUTFALL LOCATION.

ANY PROPOSED DRAINAGE
WORKS SHOULD BE COMPLETED
WITH CONSIDERATION OF THE
BELOW GROUND UTILITIES
ASSOCIATED WITH THE PRIMARY
SUBSTATION.

SURFACE WATER GENERATED
FROM THE PROPOSED
IMPERMEABLE CATCHMENTS ARE
TO BE CAPTURED AND ROUTED TO
THE PROPOSED FILTER
DRAIN/SWALE BEFORE BEING
ROUTED TO THE PROPOSED
ATTENUATION POND.

THE 100mm Ø PERFORATED UNDER
DRAIN SHOULD BE PLACED BETWEEN THE TYPE 1 SUB BASE AND GRANITE
CHIPPINGS LAYERS.

SITE SURFACING AS PER NOTE 1 TO
EXTEND 1M OUTSIDE BUILDING
PERIMETER

PROPOSED 1.2M HIGH POST AND RAIL FENCE

SITE SURFACING AS PER NOTE 1

PROPOSED T1 TRANSFORMER

151000

PROPOSED PEDESTRIAN GATE

PROPOSED T2 TRANSFORMER

SITE SURFACING AS PER NOTE 1 TO
EXTEND 1M OUTSIDE OF PALISADE FENCE
PERIMETER

PROPOSED 2.4M HIGH
PALISADE SECURITY FENCE

PROPOSED FIELD GATE

PROPOSED TARMAC
ACCESS ROAD

PROPOSED
ACCESS

SURFACE WATER IS PROPOSED TO ULTIMATELY DRAIN TO THE
DITCH LOCATED WITHIN TO THE WEST OF THE SITE AT A MAXIMUM
RESTRICT RATE OF 1.0 L/s.

ANY CONNECTION TO THE WATERCOURSE IS SUBJECT TO
APPROVAL BY THE IDB.

THE INVERT LEVEL OF THE OUTFALL DITCH IS MEASURED TO BE
1.35m AOD BASED ON EA LIDAR DATA. AS SUCH, A GRAVITY
CONNECTION IS UNDERSTOOD TO BE FEASIBLE FROM THE
PROPOSED RAINGARDEN.

ANY NEW OUTFALL IS TO BE FORMED VIA A PIPED CONNECTION
WITH NEW HEAD WALL INCLUSIVE OF A NON-RETURN VALVE.

ALL LEVELS ARE TO METERS ABOVE ORDNANCE DATUM (AOD) UNLESS STATED OTHERWISE.

BASED ON THE GEOLOGY OF THE SITE IT IS UNDERSTOOD THAT INFILTRATION WILL NOT BE FEASIBLE.

ATTENUATION OF RUNOFF GENERATED FROM THE DEVELOPMENTS IMPERMEABLE CATCHMENTS TO BE PROVIDED AN ATTENUATION POND. SURFACE WATER FROM THE PROPOSED ATTENUATION AREAS WILL ULTIMATELY DISCHARGE TO THE DITCH LOCATED TO THE WEST OF THE SITE. RUNOFF RATES WILL BE RESTRICTED TO A MAXIMUM OF 1.0L/s, UTILISING A 30mm Ø ORIFICE PLATE AT THE ATTENUATION POND OUTFALL.

ALL PIPE DIAMETERS HAVE BEEN MODELLED AT 100mm UNLESS STATED OTHERWISE.

THE VOLUMETRIC RUNOFF COEFFICIENT (CV VALUE) USED FOR ALL IMPERMEABLE AREAS WAS 0.9.

ATTENUATION IS SIZED APPROPRIATELY TO MANAGE GENERATED SURFACE WATER UP TO AND INCLUDING THE 1 IN 100 YEAR (PLUS 40% ALLOWANCE FOR CLIMATE CHANGE) EVENT.

0m 5 10 15 20 25
SCALE 1 : 250

Appendix D - InfoDrainage Calculations

Project: AEG0931_PE12_South_Holland_07 Surface Water Drainage Strategy Land at Branches Lane, South Holland,		Date: 20/09/2024			
		Designed by: OM	Checked by:		Approved By:
Report Details: Type: Junctions Storm Phase: Phase		Company Address: Aegaea Ltd			

ey	a ² '	Ty'12	e' ¹²
Sy'f'y	j'a ² '	GF/AAD	:AD/AE:

X

a ²	X'e'y	X ² 'X'12	Qy'S'y	Ry y ² 'k
Sy'f'y	X	:79:	le'2	e'i ²

Project: AEG0931_PE12_South_Holland_07 Surface Water Drainage Strategy Land at Branches Lane, South Holland,		Date: 20/09/2024			
Report Details: Type: Stormwater Controls Storm Phase: Phase		Designed by: OM	Checked by:		Approved By:
		Company Address: Aegaea Ltd			



i y y³ 'P y

k 'l'Q

g³ 'P y

T ² y ² 'c '1 2	ATC99
S '1 2	97B99
Qy 'c '1 2	A7: 99
k 'P y'1 2	A: 9799
j ³ 'j 't lo2	B799
Qy 'P y'1 2	: F97A
U z y ³ '1 2	9
g '1 2	: 99
c '1 2	AA7: 9G
c 7j 't lo2	: 999799
U y 'i y '1 8 2	D9979
U ² 'j ²	dy 0'
	979BD
k y'm '1 2	FATCF:

U 'P y

Qy 'c '1 2	: 7C99
------------	--------

l³ 'S y

W 'Pz 'Qy '1 2	97999
S y '1 2	: 99
e 7 'Qy	:
U ² 'j ²	dy 0'
	979: D
i y 'W '1 2	97999

U y 'cy

l	ey	U y 'cy '1 2	g '1 2	R ³ 2 '1 8 2	j 'k
☐	j	9	9	979	j 'k
	j y	B99	B9	D9979	

X

X

X 'k	g 'X
X ² 'X 12	: 7999
Q y 'S y	1e 2
X 'S y	g ³ 'P y
Ry y ² 'k	e 'i ²

Project: AEG0931_PE12_South_Holland_07 Surface Water Drainage Strategy Land at Branches Lane, South Holland,		Date: 20/09/2024			
		Designed by: OM	Checked by:		Approved By:
Report Details: Type: Stormwater Controls Storm Phase: Phase		Company Address: Aegaea Ltd			

f	
---	--

f	
---	--

f	'R	2	:	799:
f	'k		f	2
S	y	'1	2	979B9
R	2	'	'S	2 y
X	'c	'1	2	A7: 99

P ³	y	2	3
----------------	---	---	---

g	3	'P	y
Q	'g	'1	2
k	'g	'1	2

D-7E:	C
EB7A:	C

Project: AEG0931_PE12_South_Holland_07 Surface Water Drainage Strategy Land at Branches Lane, South Holland,		Date: 20/09/2024			
Report Details: Type: Stormwater Controls Storm Phase: Phase		Designed by: OM	Checked by:		Approved By:
		Company Address: Aegaea Ltd			



U 'S y g y

k 'l'j y

j y

T ² y ² 'c '1 2	AT99
S '1 2	97A99
Qy 'c '1 2	A7A99
k 'n ³ '1 2	: 7A99
j ³ 'j 't lo2	: 799
Qy 'n ³ '1 2	97C99
U z y ³ '1 2	9
c '1 2	: AD999
c 7j 't lo2	A99799
U y 'i y '1 8 2	D9979
U ² 'j ²	dy 0'
	979BD
k y'm '1 2	AD999

X

X

X 'k	g 'X
X ² 'X 12	: : mQ ³ 'Ry ²
Q y 'S y	le 2
X 'S y	g ³ 'P y
Ry y ² 'k	e 'i ²

X 't 2

X 'k	cy y 'X
X ² 'X 12	P ²² 'i y ³ 'Ry ² '1A2
Q y 'S y	le 2
X 'S y	g ³ 'P y
Ry y ² 'k	e 'i ²

X '1A2

X 'k	g 'X
X ² 'X 12	k y 'Ry ²
Q y 'S y	le 2
X 'S y	g ³ 'P y
Ry y ² 'k	e 'i ²

X '1B2

X 'k	cy y 'X
X ² 'X 12	P ²² 'i y ³ 'Ry ² 't 2
Q y 'S y	le 2
X 'S y	g ³ 'P y
Ry y ² 'k	e 'i ²

Project: AEG0931_PE12_South_Holland_07 Surface Water Drainage Strategy Land at Branches Lane, South Holland,		Date: 20/09/2024			
		Designed by: OM	Checked by:		Approved By:
Report Details: Type: Stormwater Controls Storm Phase: Phase		Company Address: Aegaea Ltd			

f

f

f	'R	2	: 799
f	'k	U	'S 2 y

P3 y 2 3

j y

g '1 2 : 99

Project: AEG0931_PE12_South_Holland_07 Surface Water Drainage Strategy Land at Branches Lane, South Holland,		Date: 20/09/2024			
		Designed by: OM	Checked by:		Approved By:
Report Details: Type: Inflow Summary Storm Phase: Phase		Company Address: Aegaea Ltd			

X 'cyz	R ^{2 3'} k	U 'k8 2	i ' ' d 3	P y'1 y2	g ² y ' X 1 2	l zy 'R ' 1 2	P ³ 3' g ² y ' X 1 2	P y' P y 3' 1 y2
: : m' Q ³ ' Ry ²	U ' S y g y		k ' ' ' R ² y	979: F	: 99	: 9	: : 9	979: H
P ²² 'i y ^{3'} Ry ² ' t 2	U ' S y g y		k ' ' ' R ² y	979BD	: 99	: 9	: : 9	979BH
P ²² 'i y ^{3'} Ry ² ' 1A2	U ' S y g y		k ' ' ' R ² y	979BD	: 99	: 9	: : 9	979BH
k y Ry ²	U ' S y g y		k ' ' ' R ² y	979: A	: 99	: 9	: : 9	979: B
kf kPc		979		979HH				97. 9H

Project: AEG0931_PE12_South_Holland_07 Surface Water Drainage Strategy Land at Branches Lane, South Holland,		Date: 20/09/2024			
Report Title: Rainfall Analysis Criteria		Designed by: OM	Checked by:		Approved By:
		Company Address: Aegaea Ltd			

i 'k	S y 2
f 'X y '1 2	D
k 'j	S y
l zy 'R	P 'V zy 'my
l zy 'R 'V zy 'my ' 1 2	:9
a 2 'U 3'i 'dy ' 1 2	B99
g 'e 'S 2 y ' P y	☐

i y y	
Uj i	k l'Uj i
i	T y 3'P 3'n y
d DE9'1 2	:GH
i y 'i	97C99
j	☒
n	☒

i 'g 3

i 'g 3'1 y 2	X2 y 'i y y '1 2
: 79	97999
B979	97999
B979	BD7999
: 9979	97999
: 9979	C97999

j 'S y

S y '1 2	i 'k '1 2
: D	B9
B9	E9
E9	: A9
: A9	AC9
AC9	CC9
BE9	FA9
CC9	HE9
HE9	: HA9
: CC9	AG99

Project: AEG0931_PE12_South_Holland_07 Surface Water Drainage Strategy Land at Branches Lane, South Holland, Report Title: UK and Ireland Rural Runoff Calculator	Date: 20/09/2024			
	Designed by: OM	Checked by:	Approved By:	
	Company Address: Aegaea Ltd			

Rg'j | Sj '8XV: AC

S y

d 3	Rg'j Sj
P y'1 y2	979HH
j PPi '1 2	DFC9
j	97B
i	i 'D
l zy	9
i 'g 3'1 y 2	9

i

i	h QPi 'i y ' 1c8 2	h QPi 'l zy ' 1c8 2	h ': '1 y 2' 1c8 2	h 'B9'1 y 2' 1c8 2	h ': 99'1 y 2' 1c8 2
i 'D	97.	97.	97.	97B	97D

Project: AEG0931_PE12_South_Holland_07 Surface Water Drainage Strategy Land at Branches Lane, South Holland,	Date: 20/09/2024			
	Designed by: OM	Checked by:	Approved By:	
	Report Details: Type: Junctions Summary Storm Phase: Phase			
Company Address: Aegaea Ltd				



Ujil:' y l'X² y 'iy y 'l 2'49l'R ²y'j 'g 'X l'iy 'Ql'dy 7f

a ²	j 'T	R 'X ' c ' c ' 1 2	dy 7 c ' c ' 1 2	dy 7 c ' S ' 1 2	dy 7 X ' 1c8 2	dy 7 i ³ ' m 1 2	dy 7 U ³ ³ ' m 1 2	dy 7 f 1c8 2	k y' S ² y ' m 1 2	j y
S y ' f y	Ujil:' y l'49'. l' :CC9' l'n	6 7A99	6 7. HB	9799F	97B			97B	: CA E	f b

Project: AEG0931_PE12_South_Holland_07 Surface Water Drainage Strategy Land at Branches Lane, South Holland,		Date: 20/09/2024			
Report Details: Type: Junctions Summary Storm Phase: Phase		Designed by: OM	Checked by:	Approved By:	
		Company Address: Aegaea Ltd			



Uj i l'B9' y l'X² y 'i y y 'l 2'49l'R ²y'j 'g 'X l'i y 'Q l'd y 7f

a ²	j 'T	R c 1 2	'X c 1 2	dy 7 c 1 2	dy 7 S 1 2	dy 7 X 1 2	dy 7 i 3 m 1 2	dy 7 U 3 3 m 1 2	dy 7 f 1 2	k y' S ² y' m 1 2	j y
S y ' f y	Uj i l'B9' y l'49' . l': CC9' l' j		6 7A99	6 7. H9	979: 9	97F			97F	CDGA	f b

Project: AEG0931_PE12_South_Holland_07 Surface Water Drainage Strategy Land at Branches Lane, South Holland,	Date: 20/09/2024			
	Designed by: OM	Checked by:	Approved By:	
	Report Details: Type: Junctions Summary Storm Phase: Phase			
Company Address: Aegaea Ltd				



Uj i l'B9' y l'X² y 'i y y 'l 2'4BD'R ²y'j 'g 'X l'i y 'Q l'd y 7f

a ²	j 'T	R 'X ' c ' c ' 1 2	dy 7 c ' c ' 1 2	dy 7 c ' S ' 1 2	dy 7 X ' 1c8 2	dy 7 i ³ ' m ' 1 2	dy 7 U ³ ³ ' m ' 1 2	dy 7 f 1c8 2	k y ' S ² y ' m ' 1 2	j y
S y ' f y	Uj i l'B9' y l'4BD . l'HE9' l' j	6 7A99	6 7.GH	979: :	97G			97G	DD7HF9	f b

Project: AEG0931_PE12_South_Holland_07 Surface Water Drainage Strategy Land at Branches Lane, South Holland,		Date: 20/09/2024			
Report Details: Type: Junctions Summary Storm Phase: Phase		Designed by: OM	Checked by:		Approved By:
		Company Address: Aegaea Ltd			



Ujil':99' y l'X² y 'iy y 'l 2'49l'R ²y'j 'g 'X l'iy 'Ql'dy 7f

a ²	j 'T	R c 1 2	'X c 1 2	dy 7 c 1 2	dy 7 S 1 2	dy 7 X 1 2	dy 7 i 3 m 1 2	dy 7 U 3 3 m 1 2	dy 7 f 1 2	k y' S ² y' m 1 2	j y
S y ' f y	Ujil':99' y l'49' . l'HE9' l' j		6 7A99	6 7.H9	979: 9	97G			97G	DB79BG	f b

Project: AEG0931_PE12_South_Holland_07 Surface Water Drainage Strategy Land at Branches Lane, South Holland,		Date: 20/09/2024			
Report Details: Type: Junctions Summary Storm Phase: Phase		Designed by:	Checked by:	Approved By:	
		OM			
		Company Address: Aegaea Ltd			



Ujil':99' y l'X² y 'iy y 'l 2'4C9l'R ²y'j 'g 'X l'iy 'Ql'dy 7f

a ²	j 'T	R c 1 2	'X 'c 1 2	dy 7 c 1 2	dy 7 S 1 2	dy 7 X 1 2	dy 7 i m 1 2	dy 7 U m 1 2	dy 7 f 1 2	k y' S ² y' m 1 2	j y
S y ' f y	Ujil':99' y l'4C9' . l'HE9' l' j	6 7A99	6 7.GG	979: A	: 79				: 79	FA7FGG	f b

Project: AEG0931_PE12_South_Holland_07 Surface Water Drainage Strategy Land at Branches Lane, South Holland,		Date: 20/09/2024			
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase		Designed by: OM	Checked by:		Approved By:
		Company Address: Aegaea Ltd			



Ujil': ' y l'X² y 'iy y 'l 2'49l'R ²y'j 'g 'X l'i y 'Q l'd y 7P 7
S

j y R	j T	dy 7 l j' c 1 2	dy 7 Sj' c 1 2	dy 7 l j' S 1 2	dy 7 Sj' S 1 2	dy 7 X 1 2	dy 7 i 3 m 1 2	dy 7 U 3 3 m 1 2	k y' c 1 2	dy 7 f 1 2	k y' S 2 y 1 2	g 2 y P y yz 1 2	j y
U S y g y	Ujil': 49'. l'B9' l' j	A7ED	A7AFB	979B9	979FB : 97G	CDHE	97999	97999	GB	GFBA	G 7E: D	f b	
iy 'P y	Ujil': 49'. l': C9' l'n	A7 CB	A7 CB	97BA	97BCB 97G	A97GE	97999	97999	97B	: C7A E	F: 7 G	f b	

Project: AEG0931_PE12_South_Holland_07 Surface Water Drainage Strategy Land at Branches Lane, South Holland,		Date: 20/09/2024			
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase		Designed by: OM	Checked by:		Approved By:
		Company Address: Aegaea Ltd			



Uj i l' B9' y l' X² y ' i y y ' l 2' 49 l' R 2 y ' j ' g ' X l' i y ' Q l' d y 7 P 7
S

j ' y R	j ' T	dy 7 l j ' c ' 1 2	dy 7 S j ' c ' 1 2	dy 7 l j ' S ' 1 2	dy 7 S j ' S ' 1 2	dy 7 X 1 2	dy 7 i 3 m ' 1 2	dy 7 U 3 3 m 1 2	k y ' c ' 1 2	dy 7 f 1 2	k y ' S 2 y m 1 2	g 2 y P y y z 1 2	j y
U ' S y g y	Uj i l' B9' y l' 49'. l' B9' l' j	A7GFF	A7BA'	979DA	97. A'	AETC	GBEG	97999	97999	AC7C	AA7ABG	EE7DAG	f b
i y y 3 ' P y	Uj i l' B9' y l' 49'. l' : CC9' l' j	A7ACE	A7ACD	97CAB	97CCD	A7G	BH7BDE	97999	97999	97F	CC7GB	CC7EHC	f b

Project: AEG0931_PE12_South_Holland_07 Surface Water Drainage Strategy Land at Branches Lane, South Holland,		Date: 20/09/2024		
		Designed by: OM	Checked by:	Approved By:
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase		Company Address: Aegaea Ltd		



Uj i l'B9' y l'X² y 'i y y 'l 2'4BD'R 2y'j 'g 'X l'i y 'Q l'd y 7P 7
S

j ' R	j 'T	dy 7 l j' c ' 1 2	dy 7 Sj' c ' 1 2	dy 7 l j' S ' 1 2	dy 7 Sj' S ' 1 2	dy 7 X 1 2	dy 7 i 3 m ' 1 2	dy 7 U 3 3 m 1 2	k y' c ' 1 2	dy 7 f 1 2	k y' S 2 y m 1 2	g 2 y P y yz 1 2	j y
U S y g y	Uj i l'B9' y l'4BD. l' B9' l' j	A7GGF	A7BCA	979EA	97: CA	BDF	: 97: CC	97999	97999	BC9	B97AB:	DHCAA	f b
i y y 3 'P y	Uj i l'B9' y l'4BD. l' HE9' l' j	A7B: 9	A7B: 9	97GGG	97D: 9	D7:	D 7FDF	97999	97999	97G	DDHFF	AGDCB	f b

Project: AEG0931_PE12_South_Holland_07 Surface Water Drainage Strategy Land at Branches Lane, South Holland,		Date: 20/09/2024			
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase		Designed by: OM	Checked by:		Approved By:
		Company Address: Aegaea Ltd			



Uj i l': 99' y l'X² y 'i y y 'l 2'49l'R 2y'j 'g 'X l'i y 'Q l'd y 7P 7
S

j y ' R	j 'T	dy 7 l j ' c ' 1 2	dy 7 Sj ' c ' 1 2	dy 7 l j ' S ' 1 2	dy 7 Sj ' S ' 1 2	dy 7 X ' 1 2	dy 7 i 3 ' 1 2	dy 7 U 3 3' m 1 2	k y ' c ' 1 2	dy 7 f ' 1 2	k y ' S 2 y ' m 1 2	g 2 y ' 1 2	j y
U S y g y	Uj i l': 99' y l'49'. l' B9' l' j	A73GE	A7BC9	979E:	97: C9	BCD	H7HBC	97999	97999	BA7G	AH7ACA	E97AEB	f b
i y y 3 'P y	Uj i l': 99' y l'49'. l' HE9' l' j	A7AHG	A7AHF	97CFD	97CHF	CH	CH7AGD	97999	97999	97G	DB79CE	B: 7HB	f b

Project: AEG0931_PE12_South_Holland_07 Surface Water Drainage Strategy Land at Branches Lane, South Holland,		Date: 20/09/2024			
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase		Designed by: OM	Checked by:		Approved By:
		Company Address: Aegaea Ltd			



Uj i l': 99' y l'X² y 'i y y 'l 2'4C9l'R 2y'j 'g 'X l'i y 'Q l'd y 7P 7
S

j ' y R	j ' T	dy 7 l j' c ' 1 2	dy 7 S j' c ' 1 2	dy 7 l j' S ' 1 2	dy 7 S j' S ' 1 2	dy 7 X 1 2	dy 7 i 3 m ' 1 2	dy 7 U 3 3' m ' 1 2	k y' c ' 1 2	dy 7 f 1 2	k y' S 2 y' m ' 1 2	g 2 y ' P y yz ' 1 2	j y
U ' S y g y	Uj i l': 99' y l'4C9'. l' : D l' j	A7H B	A7BDH	979GG	97: DH	FA7G	: A7: CE	97999	97999	CB7G	B97: : C	D 7ADD	f b
i y y 3 'P y	Uj i l': 99' y l'4C9'. l' HE9' l' j	A7BGH	A7BGH	97DEF	97DGH	ETC	EF7EE9	97999	97999	: 79	FA7FHG	E7EBG	f b