



**SSE New Maintenance Building
Harts Farm Way
Havant
PO9 1JN**

Flood Risk Assessment

Prepared for: SSE

Project No: TC21006
Date: September 2022

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Revision	Amendments	By	Date
P01	Preliminary issue	Graham Taylor (IEng MICE)	04.08.21
P02	Updated following client discussions	GT	14.09.21
P03	Culvert details added	GT	08.09.22

1.0 Introduction

- 1.1** Taylor Consulting Engineers have been commissioned to undertake a Flood Risk Assessment (FRA) to assess the proposed industrial building to be constructed within the service yard at the Harts Farm Way SSE substation.
- 1.2** This Flood Risk Assessment has been produced using the relevant data and flood maps available at the time of the report. Any subsequently updated flood data and maps would need to be assessed against the development to ensure there is no change in the flood risk to the assessed site.
- 1.3** The site is indicated as being located within Flood Zone 3 and 2 based on the online flood maps.

Zone 3 – Land having greater than 1% annual probability of flooding in any year.

Zone 2 – Land having between 1% and 0.1% annual probability of flooding in any year.

Zone 1 – Land having less than 0.1% annual probability of flooding in any year.

The site is located southwest of Havant and northwest of Langstone within an industrial developed area.

The contents of this FRA describe the assessment of the proposed use and associated flood risk. The FRA has been prepared following guidance provided in the National Planning Policy Framework (February 2019) and the Planning Practice Guidance to the National Planning Policy Framework (October 2018).

A planning application is being submitted and this assessment seeks to provide the level of detail necessary to demonstrate that the potential effects of flood risk (to the proposal) have been addressed by identifying the source and probability of flooding to the application site, including effects of climate change;

- Determining the consequences of flooding to the building and use; and advising on the how this will be managed, if necessary; and
- Demonstrating the flood risk issues described in this assessment are compliant with the relevant guidance.

The scope of data available is summarised in this report and in the associated plans (attached within appendices). An assessment of areas potentially at risk from flooding has been undertaken and the proposed building has been examined in relation to their potential to increase flood risk both on and off site. This FRA supports the construction of the proposed buildings to demonstrate that flood risk has been given material consideration throughout the development process and the proposed building should not be restricted at this site due to flood risk.

2.0 Policy & Guidance

2.1 Flood & Water Management Act, 2010

Combined with the Flood Risk Regulations 2009, (which enact the EU Floods Directive in England and Wales) the Act places significantly greater responsibility on Local Authorities to manage and lead on local flooding issues. The Act and The Regulations together raise the requirements and targets Local Authorities need to meet, including:

- Playing an active role leading Flood Risk Management;
- Development of Local Flood Risk Management Strategies (LFRMS);
- Implementing requirements of Flood and Water Management legislation.
- Preparation of preliminary flood risk assessments and flood risk management plans; and
- Development and implementation of drainage and flooding management strategies.

The Flood and Water Management Act also clarifies three key areas that influence development:

- Sustainable Drainage Systems (SuDS) - the Act makes provision for a national standard to be prepared on SuDS, and developers will be required to obtain local authority approval for SuDS in accordance with the standards, likely with conditions.
- Flood risk management structures - the Act enables the EA and local authorities to designate structures such as flood defences or embankments owned by third parties for protection if they affect flooding or coastal erosion. A developer or landowner will not be able to alter, remove or replace a designated structure or feature without first obtaining consent; and
- Permitted flooding of third-party land - The EA and local authorities have the power to carry out work which may cause flooding to third party land where the works are deemed to be in the interest of nature conservation, the preservation of cultural heritage or people's enjoyment of the environment or of cultural heritage

2.2 National Planning Policy Framework (NPPF) February 2019

In determining an approach for the assessment of flood risk for the proposal there is a need to review the policy context. Government Guidance requires that consideration be given to flood risk in the planning process. The National Planning Policy Framework was issued in February 2019 and outlines the national policy on development and flood risk assessment.

The Framework states that the inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risk, but where development is necessary, making it safe without increasing flood risk elsewhere.

The essence of NPPF is that:

- Local Plans should be supported by Strategic Flood Risk Assessment and develop policies to manage flood risk from all sources, taking advice from the

- Environment Agency and other relevant flood risk management bodies, such as lead local flood authorities and internal drainage boards;
- Policies in development plans should outline the consideration, which will be given to flood issues, recognising the uncertainties that are inherent in the prediction of flooding and that flood risk is expected to increase as a result of climate change.
 - Planning authorities should apply the precautionary principle to the issue of flood risk, using a risk-based search sequence to avoid such risk where possible and managing it elsewhere.
 - The vulnerability of a proposed land use should be considered when assessing flood risk.
 - Use opportunities offered by new developments to reduce the causes and impacts of flooding.
 - Planning authorities should recognise the importance of functional floodplains, where water flows or is held at times of flood and avoid inappropriate development on undeveloped and undefended floodplains; and
 - The concept of Flood Risk Reduction, particularly in circumstances where development has been sanctioned on the basis of the “Exception Test”.

2.3 Planning Practice Guidance

The Planning Practice Guidance provides additional guidance to local planning authorities to ensure the effective implementation of the planning policy set out in the National Planning Policy Framework on development in areas at risk of flooding.

The document provides supporting information on:

- The application of the sequential approach and Sequential and Exception Tests;
- Measures to reduce flood risk to acceptable levels;
- How to manage residual risks; and
- Guidance on how to take climate change into account

2.4 The Strategic Flood Risk Assessment (SFRA)

The SFRA is a planning tool that will assist the councils in their selection and development of sustainable site allocations away from vulnerable flood risk areas. The assessment focuses on the existing site allocations, but also sets out the procedure to be followed when assessing additional sites for development in the future. The SFRA will assist the council to make the spatial planning decisions required to inform the forthcoming Local Development Frameworks (LDF).

The site is not specifically mentioned in the SFRA although the following general comment is made regarding the wider area and flood risk:

“Flooding from the sea, due to extreme tides, is the predominant source of flood risk to the sub-region’s most populated areas on low lying coastlines in Portsmouth, Southampton, Isle of Wight, Gosport, Havant, Fareham, Eastleigh and the New Forest. In addition, the coastal frontages of Portsea, Hayling Island and Southern and Eastern coasts of the Isle of Wight have experienced flooding caused by wave overtopping.”

3.0 Development Site Details

3.1 Development Description & Location

The site is located at grid reference SU 70557 05703. The site is located to the south of Havant within an existing SSE maintenance facility.

Plans of the proposed site can be found in Appendix D.

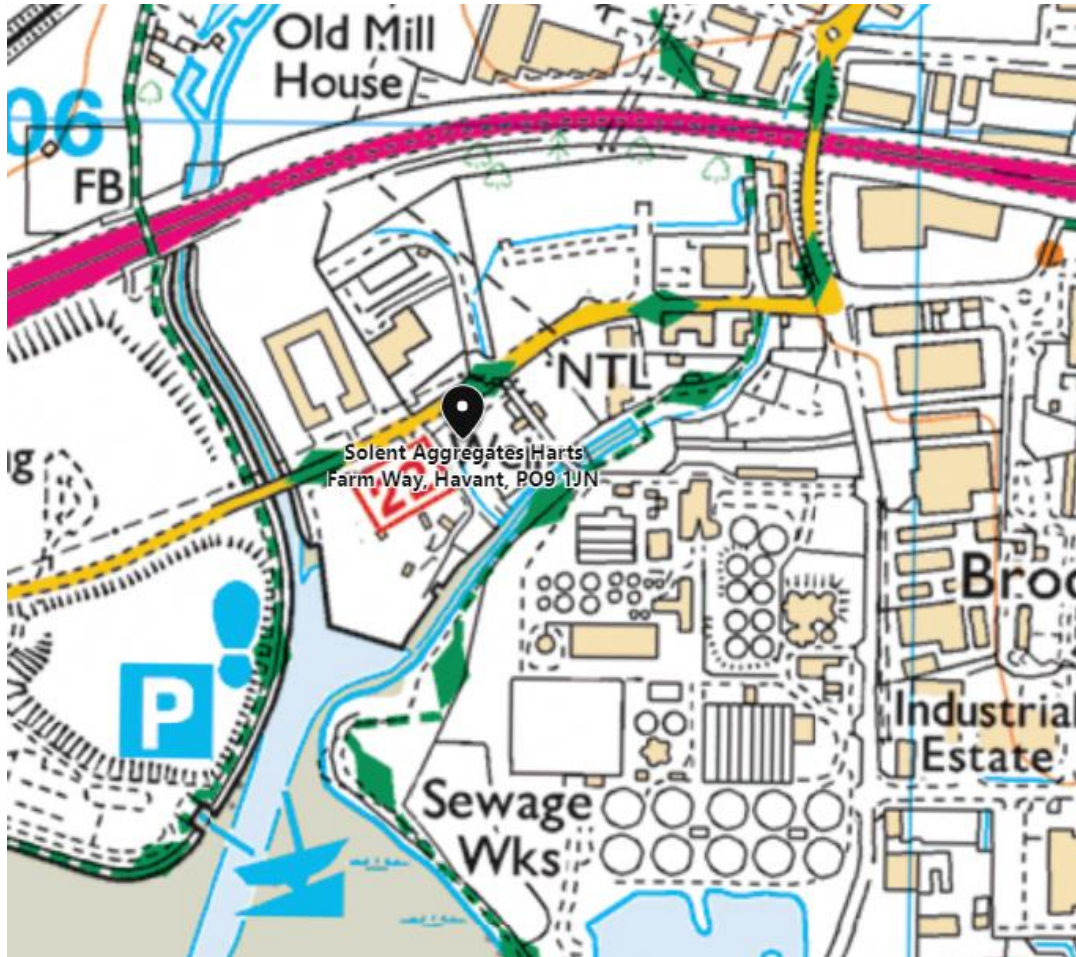


Figure 1 – Location Plan

3.2 Vulnerability Classification

The site is indicated as being located within Flood Zone 3 and 2 on the online flood maps.

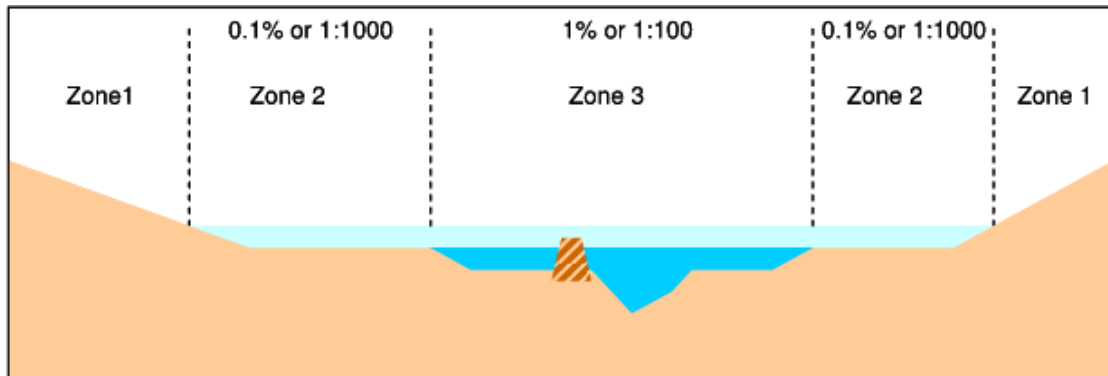


Figure 2 - Flood Zones

The Environment Agency's flood zone map is provided in Appendix C.

The planning application is for a "less vulnerable" land use based on the Environment Agency Flood risk assessments: climate change allowances Guidance 2017.

The ground floor level of the building will be set above the existing ground level which is above the 0.5% AEP flood level.

3.3 Site Drainage

The existing site does not appear to have any formal surface water drainage with all surface water discharging either into the ground or running directly into local ditches which then flow south into the main watercourses and sea beyond.

The proposed surface water drainage will utilise SuDS from the new roof and will discharge at an agreed rate into the ground or local watercourse depending on existing ground conditions and water table.

The existing main river outside of the site is under the control of the Environment Agency and initial contact has been made with them regarding construction of a building close to a main river and have stated the following:

The proposed works are within 8 metres of a main river and would usually require a Flood Risk Activity Permit. However, organisations listed in paragraph 1(4) of Schedule 22 of the Water Resources Act 1991 are permitted to carry out certain flood risk activities (see Schedule 25 of The Environmental Permitting (England and Wales) Regulations 2016 for full details) as part of their statutory function without the requirement for a permit from the regulator.

From your description, it seems likely that SSE would be able to carry out these works as a Protected Undertaking unless the activities include:

- *erecting any structure (whether temporary or permanent) in, over or under a main river;*
- *the carrying out of any work of alteration or repair on any structure (whether temporary or permanent) in, over or under a main river if the work is likely to affect the flow of water in the main river or to affect any drainage work;*
- *erecting or altering any structure (whether temporary or permanent) designed to contain or divert the floodwaters of any part of a main river;*

Whilst protected undertakings do not need a FRAP, the Environment Agency still needs confirmation from the organisation that their proposed works are protected undertakings. If the Environment Agency agrees then we will grant permission for the works to go ahead.

Site investigations have been carried out to locate the culvert and assess the risk of the new building to the culvert, Refer to drawing in Appendix D. The Environment Agency have confirmed the investigations have allayed the concerns raised.

4.0 Flood Probability and Hazard

4.1 Catchment Background

The site lies within the East Hampshire catchment which is part of the wider South East Catchment.

DEFRA Catchment data states “The East Hampshire catchment covers an area of 571km², with rolling chalk downland to the north and a flat, heavily urbanised coastal plain in the south, including Portsmouth, where the Royal Navys surface fleet is based. The main rivers in the catchment are the Hamble, Meon, Wallington, Hermitage and Lavant. Their sources are in the upland chalk, from where they flow into Southampton Water or the harbours of Portsmouth and Langstone.”

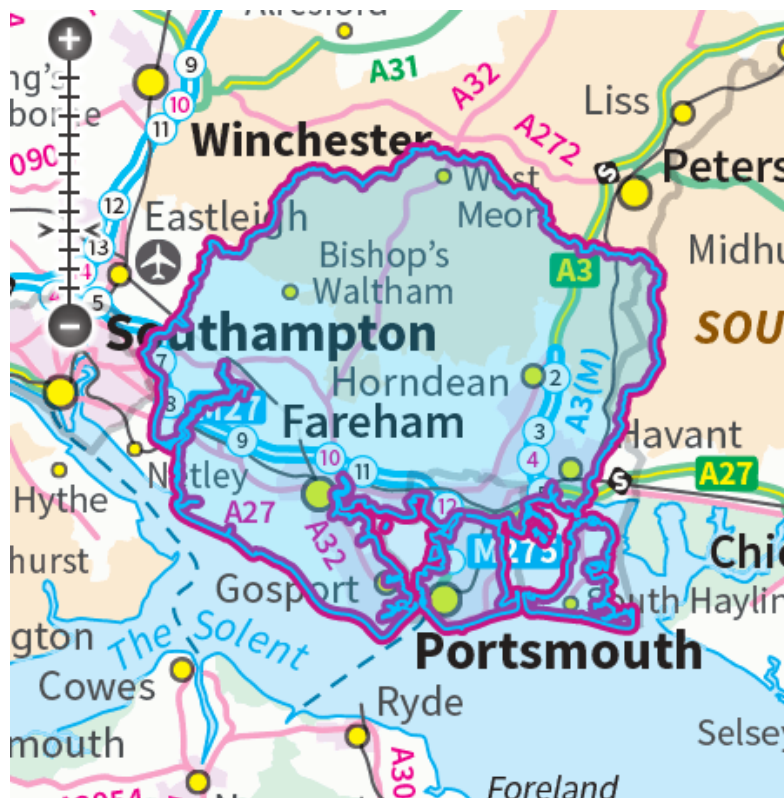


Figure 3 – East Hampshire Catchment

4.2 Local Geology

BGS Geology maps and boreholes indicate that the site is underlain alluvium over chalk. The ground water levels are likely to be close to the surface and fluctuate with tides and river levels.

4.3 Groundwater Source Protection Zone

The site lies outside the groundwater Source Protection Zones (SPZ) although is located north of the SSSI (Langstone Harbour) therefore additional measure for the protection of the groundwater will need to be incorporated into the drainage design to ensure adequate pollution control measures are in place.

4.4 Historical Flooding

The Environment Agency have confirmed that they have no recorded flood events in for this location.

4.5 Flood Zone

Flood zones describe the extent of flooding that would occur on the basis that no flood defences were in existence. They also describe the extent to which land under scrutiny is afforded protection by the presence of defences. The definition of Flood Zones is provided in the EA Flood risk assessments: climate change allowances.

4.6 Sources of Flooding – Flood Risk

The NPPF describes potential sources of flooding. It is necessary to consider the risk of flooding from all sources within an FRA. This section provides a review of flooding from land, sewers, groundwater and artificial sources, in addition to rivers.

4.7 Fluvial and Tidal Flood Risk

A review of the flood extents from the SFRA and historical flood data indicate that the site is in flood zone 3 and 2 based on the available flood data.

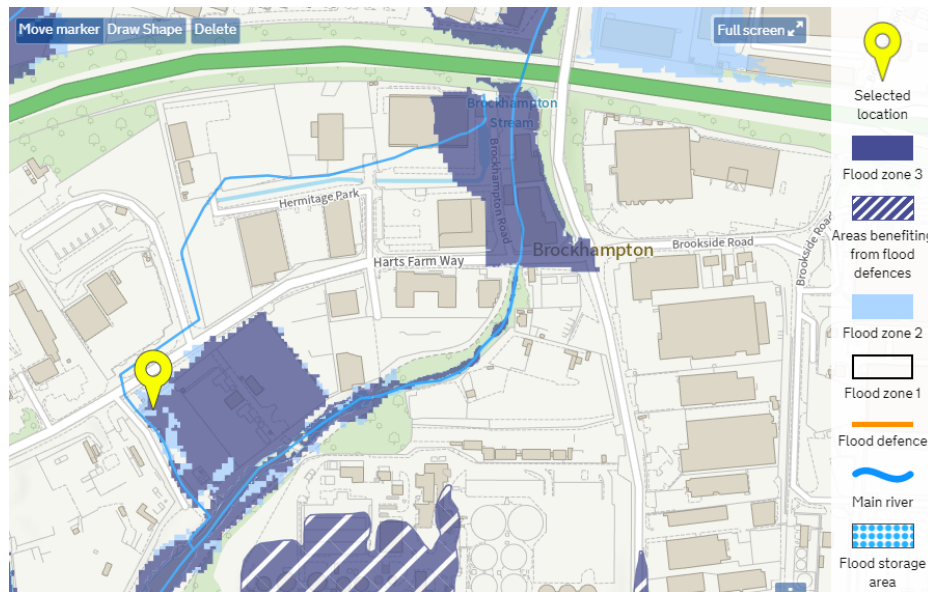


Figure 4 - Environment Agency Fluvial Flood Map

The flood data provided has confirmed the following flood levels:

0.5% AEP	3.37m AOD
0.1% AEP	3.55m AOD

The topographical survey carried out confirms that the location of the proposed building is currently at a level of 3.40m AOD. The area of the proposed building is therefore located in flood zone 2. The entire site falls from north to south with the public footpath along Harts Farm Road immediately outside the site at 3.60m falling to 2.84m along the southern boundary.

The watercourse to the west of the site flows from north to south and appears to be culverted from Harts Farm Road past the proposed building and outfalls into a ditch outside of the ownership of SSE. This ditch is classified as a main river therefore under the ownership of the Environment Agency. The ditch levels have been surveyed as 1.80m AOD to 1.71m where the ditch is culverted again and outfalls into the marina at a level of 0.77m AOD. The outfall into the marina appears to be via a flap valve that does not appear to be operational and is unable to fully close and is stuck in the open position.



Figure 5 – Main River outlet partially blocked

Given the risk associated with the tidal flood levels the site is at a **MEDIUM-HIGH** risk of tidal flooding.

4.8 Flood Risk from Surface Water & Overland Flow

Flooding from land can be caused by rainfall being unable to infiltrate into the natural ground or enter the drainage systems due to blockage, or flows being above design capacity. This can then result in (temporary) localised ponding and flooding. The natural topography and location of buildings / structures can influence the direction and depth of water flowing off impermeable and permeable surfaces.

The site is indicated as a low risk of surface water flooding with less than 300mm flooding in the 0.1% AEP event. The location of the proposed building is on land slightly higher than the surrounding ground with falls towards the south therefore should be considered outside any area affected by surface water flooding.

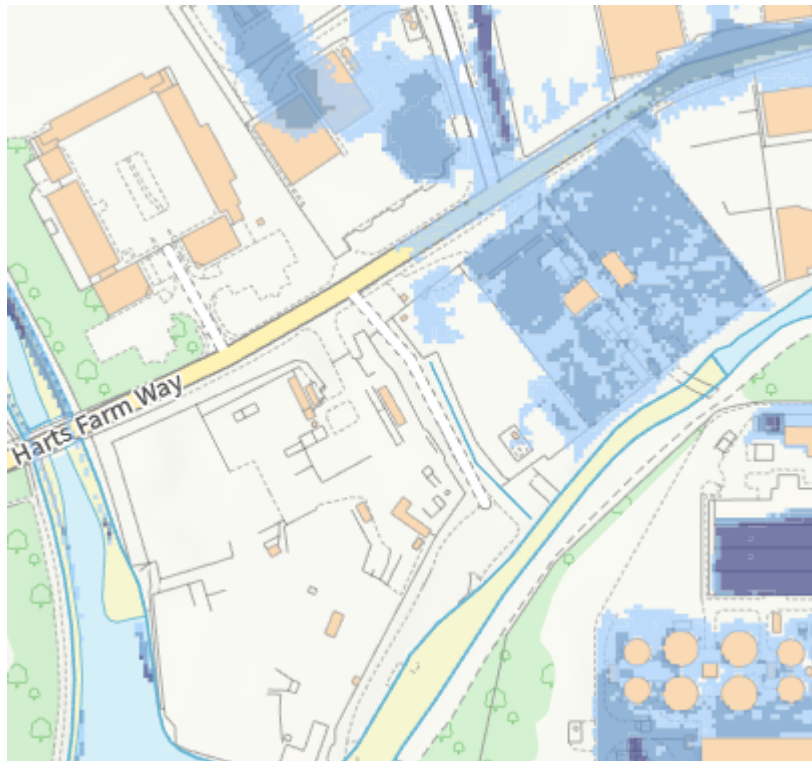


Figure 6 – Surface water flood map (Existing site)

It is considered that the proposed building is at a **LOW** risk of surface water and overland flow flooding.

4.9 Flood Risk from Groundwater

Groundwater flooding occurs as a result of water rising up from the underlying aquifer or from water flowing from abnormal springs. This tends to occur after long periods of sustained high rainfall, and the areas at most risk are often low-lying where the water table is more likely to be at shallow depth.

There are several mechanisms which produce groundwater flooding including prolong rainfall raising groundwater levels, high in bank river levels, artificial obstructions and groundwater rebound.

The local geological boreholes indicate ground water is present close to the surface and will fluctuate with the river and sea levels.

The risk of ground water flooding to the new building is considered low as the tidal flood risk will dominate any potential groundwater flooding issues.

4.10 Flood Risk from Sewers

Surface water flooding as a result of sewer blockages, failures or insufficient capacity has the potential to contribute significant flood risk in urban areas. This is due to the rapid run off rates associated with urban land use and the volume of water that flows into the sewer systems in relatively short periods of time.

There are no formal drainage systems on the site with surface water flowing off the site into local ditches. Any flooding on the public highway would be contained and transported along the public highway.

The surface water system for the proposed building will be designed to meet current standards with no flood water leaving the site for the 100 year +40% climate change storm event.

It is concluded that if the new sewer system for the proposed building is maintained then there is a **LOW** risk of sewer flooding to the proposed building.

4.11 Flood Risk from Artificial Sources

Artificial sources of flooding include reservoirs, canals, lakes and mining abstraction.

The site is located outside the extent of flooding from reservoirs.

The Environment Agency states that “Reservoir flooding is extremely unlikely. There has been no loss of life in the UK from a reservoir flooding since 1925. Since then reservoir safety legislation has been introduced to make sure reservoirs are well maintained.”

The risk to the proposed building from reservoir flooding is considered **LOW**.

5.0 Flood Risk Management

5.1 Principles of Flood Risk Management

NPPF requires a precautionary approach to be undertaken when making land use planning decisions regarding flood risk. This is partly due to the considerable uncertainty surrounding flooding mechanisms and how flooding may respond to climate change. It is also due to the potentially devastating consequences of flooding to the people and property affected.

Flood risk is a combination of the probability of flooding and the consequences of flooding. Hence 'managing flood risk' involves managing either, the probability of flooding or the consequences of flooding, or both.

NPPF requires flooding from tidal, fluvial, overland, surface water & sewerage and from groundwater to be considered. The flood risk management measures discussed in this section are based on the sources of flooding identified in Section 4 that are considered to pose a risk to the development proposals.

5.2 Flood Risk Management

Section 4 identified the sources of flooding that require investigating to ensure that the risk to the building is an acceptable level in compliance with NPPF:

- Fluvial & Tidal Flood Risk.

5.3 Fluvial & Tidal Flood Risk

A risk of tidal flooding has been identified on the site and the 0.5% AEP & 0.1% flood level has been given as 3.37m AOD and 3.55m AOD respectively. The proposed site of the building is located at an average of 3.45m AOD ground level and would therefore be in flood zone 2.

There are no climate change flood levels given by the Environment Agency although the PUSH SFRA mapping indicates climate change tidal flood maps as highlighted below.

2025 climate change flood area below indicated the area of the proposed building being generally outside the area susceptible to flooding which is in line with the topographical survey levels with a flood level of 3.40m.

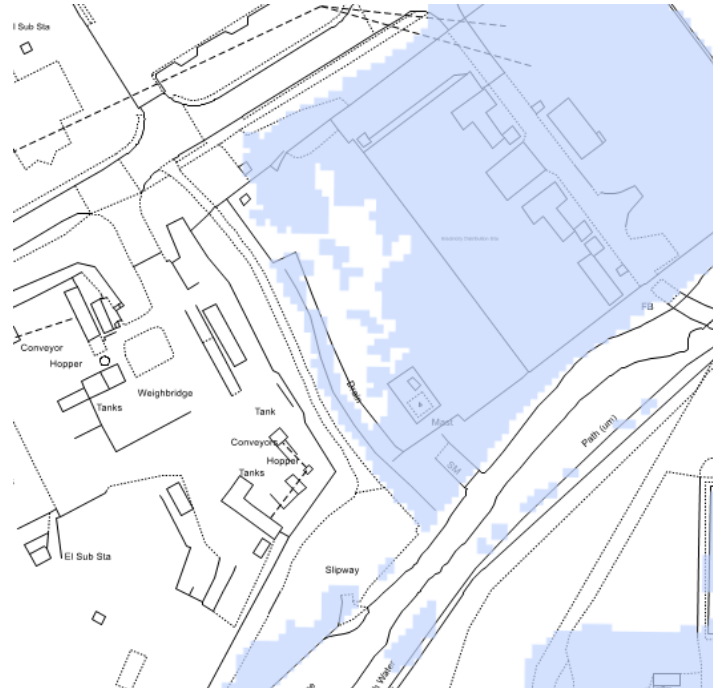


Figure 7 - 2025 Climate change tidal flood map

The 2055 tidal flood map indicates the site within this flood zone but highlights the area to the north including Harts Farm Way as outside the flooded area. This area has been surveyed and interpolates as 3.50m flood level.

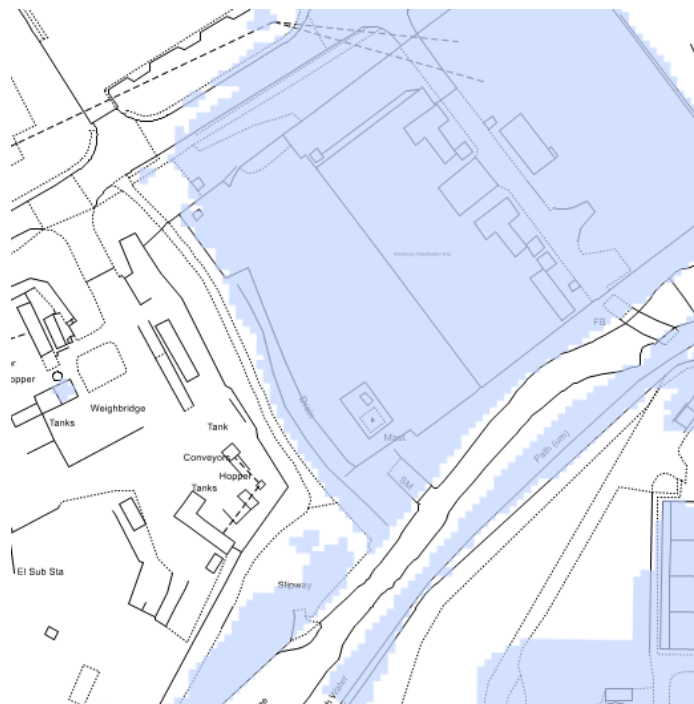


Figure 8 - 2055 Climate change tidal flood map

The 2085 tidal flood level indicates the site within the flood area and highlights Harts Farm Way as flooded which interpolates as 3.95m AOD.

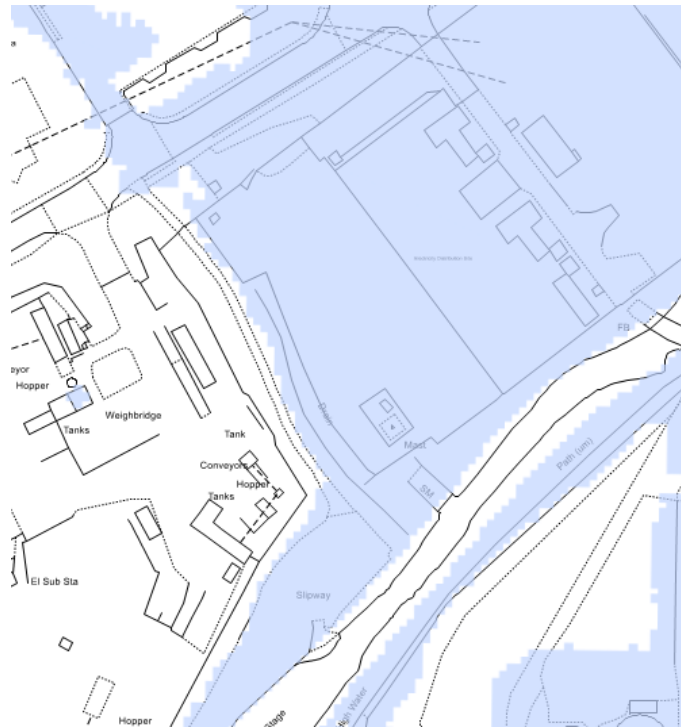


Figure 9 - 2085 Climate change tidal flood map

The 2115 tidal flood event indicates the site within the flooded area with only a small area of the grass mound to the north outside of the flooded area which interpolates as a flood level of 4.20m.

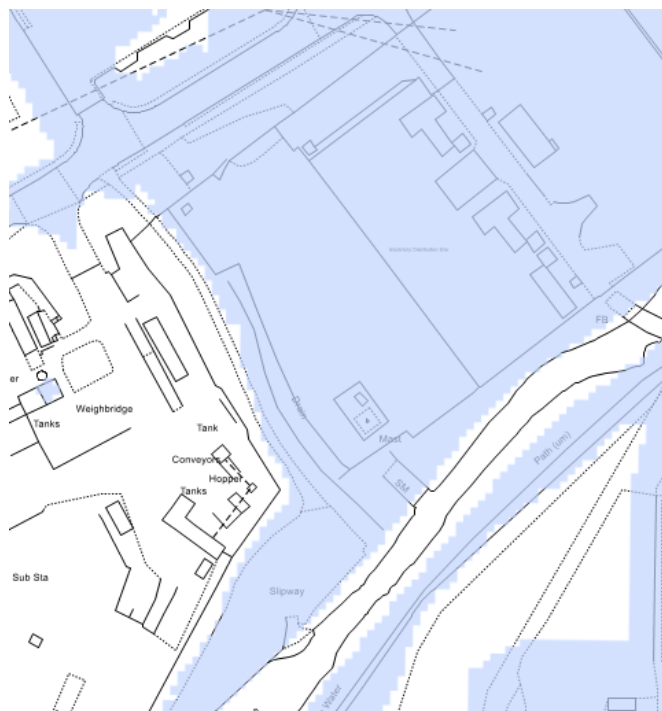


Figure 10 - 2115 Climate change tidal flood map

The location of the proposed building has been determined so that it meets the safety distance requirements from the existing electrical equipment on site and locating the building on the highest point of the site within the security fence line, in line with current guidance.

The proposed building is a storage/maintenance building therefore would be expected to have a 30–40-year life span therefore using the 2055 tidal flood level of 3.50m as the design flood level is appropriate, the proposed building will be located with a FFL of 3.60m AOD which is the above as the 0.1%AEP (1000 year) Environment Agency tidal flood level and the 2055 0.5% climate change flood level.

5.4 Flood Storage

The location of the building is considered to be in flood zone 2 therefore no flood compensation would be required.

The building will therefore not impact on the wider flood storage for the area.

6.0 Safe Access/Egress Arrangements

6.1 Access & Egress

Demonstrating safe access and egress is available for the site for the development lifetime is a key factor in demonstrating compliance with the NPPF. This requires site occupants to be able to safely access and exit the building in design flood conditions. Vehicular access to allow the emergency services to safely reach the development during design flood conditions is also normally required.

Access and egress would be achieved for all flood events and there would be no change of access to the site as a result of the proposed building. The site as a whole is registered with the Environment Agency flood warning system therefore any early warning of a possible flood would allow the site to be evacuated as required.

7.0 Flood Resilience and Resistance.

The building is located above the design flood level therefore flood resistant or resilience is not required. Given the location and tidal flood risk it would be prudent to incorporate some flood resilient measures where practical including:

- All floor finishes to be flood resilient, e.g., concrete, or similar
- All electrical sockets located 1m above ground level
- Raising any critical equipment above the floor slab where practical, either on plinths or grillage.

The client accepts that in tidal flooding events over and above the design flood level the building will flood. Future tidal flood levels should be reviewed during the life of the building to assess any increased risk due to climate change.

8.0 Conclusion

- The site of the building is in Flood Zone 2.
- The vulnerability classification is less vulnerable.
- The proposed building is suitable for its location.
- The building FFL will be located above the 0.1% AEP flood level and the 2055 climate change flood level.
- The building will be designed to be robust using flood resilient materials.
- All electrical sockets will be located 1m above the floor level to ensure additional protection to any equipment.
- Any critical equipment should be raised above the floor slab where practical to increase the protection from flooding.
- The culverted main river past the site has been located by survey and the Environment Agency are satisfied that the culvert will not be damaged as a result of the proposed building.

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Appendix A

Flood Zones

Table 1: Flood zones

(Note: These flood zones refer to the probability of river and sea flooding, ignoring the presence of defences)

Zone 1 - low probability**Definition**

This zone comprises land assessed as having a less than 1 in 1,000 annual probability of river or sea flooding (<0.1%).

Appropriate uses

All uses of land are appropriate in this zone.

Flood risk assessment requirements

For development proposals on sites comprising one hectare or above the vulnerability to flooding from other sources as well as from river and sea flooding, and the potential to increase flood risk elsewhere through the addition of hard surfaces and the effect of the new development on surface water run-off, should be incorporated in a flood risk assessment. This need only be brief unless the factors above or other local considerations require particular attention.

Policy aims

In this zone, developers and local authorities should seek opportunities to reduce the overall level of flood risk in the area and beyond through the layout and form of the development, and the appropriate application of sustainable drainage systems².

Zone 2 - medium probability

Definition

This zone comprises land assessed as having between a 1 in 100 and 1 in 1,000 annual probability of river flooding (1% – 0.1%), or between a 1 in 200 and 1 in 1,000 annual probability of sea flooding (0.5% – 0.1%) in any year.

Appropriate uses

Essential infrastructure and the water-compatible, less vulnerable and more vulnerable uses, as set out in table 2, are appropriate in this zone. The highly vulnerable uses are *only* appropriate in this zone if the Exception Test is passed.

Flood risk assessment requirements

All development proposals in this zone should be accompanied by a flood risk assessment.

Policy aims

In this zone, developers and local authorities should seek opportunities to reduce the overall level of flood risk in the area through the layout and form of the development, and the appropriate application of sustainable drainage systems.

Zone 3a - high probability

Definition

This zone comprises land assessed as having a 1 in 100 or greater annual probability of river flooding (>1%), or a 1 in 200 or greater annual probability of flooding from the sea (>0.5%) in any year.

Appropriate uses

The water-compatible and less vulnerable uses of land (table 2) are appropriate in this zone. The highly vulnerable uses should not be permitted in this zone.

The more vulnerable uses and essential infrastructure should only be permitted in this zone if the Exception Test is passed. Essential infrastructure permitted in this zone should be designed and constructed to remain operational and safe for users in times of flood.

Flood risk assessment requirements

All development proposals in this zone should be accompanied by a flood risk assessment.

Policy aims

In this zone, developers and local authorities should seek opportunities to:

- reduce the overall level of flood risk in the area through the layout and form of the development and the appropriate application of sustainable drainage systems;

- relocate existing development to land in zones with a lower probability of flooding; and
- create space for flooding to occur by restoring functional floodplain and flood flow pathways and by identifying, allocating and safeguarding open space for flood storage.

Zone 3b - the functional floodplain

Definition

This zone comprises land where water *has* to flow or be stored in times of flood.

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. The identification of functional floodplain should take account of local circumstances and not be defined solely on rigid probability parameters. But land which would flood with an annual probability of 1 in 20 (5%) or greater in any year, or is designed to flood in an extreme (0.1%) flood, should provide a starting point for consideration and discussions to identify the functional floodplain.

Appropriate uses

Only the water-compatible uses and the essential infrastructure listed in table 2 that has to be there should be permitted in this zone. It should be designed and constructed to:

- remain operational and safe for users in times of flood;
- result in no net loss of floodplain storage;
- not impede water flows; and
- not increase flood risk elsewhere.

Essential infrastructure in this zone should pass the Exception Test.

Flood risk assessment requirements

All development proposals in this zone should be accompanied by a flood risk assessment.

Policy aims

In this zone, developers and local authorities should seek opportunities to:

- reduce the overall level of flood risk in the area through the layout and form of the development and the appropriate application of sustainable drainage systems;
- relocate existing development to land with a lower probability of flooding.

Table 2: Flood risk vulnerability classification

Essential infrastructure • Essential transport infrastructure (including mass evacuation routes) which has to cross the area at risk. • Essential utility infrastructure which has to be located in a flood risk area for operational reasons, including electricity generating power stations and grid and primary substations; and water treatment works that need to remain operational in times of flood. • Wind turbines.
Highly vulnerable • Police stations, ambulance stations and fire stations and command centres and telecommunications installations required to be operational during flooding. • Emergency dispersal points. • Basement dwellings. • Caravans, mobile homes and park homes intended for permanent residential use³. • Installations requiring hazardous substances consent⁴. (Where there is a demonstrable need to locate such installations for bulk storage of materials with port or other similar facilities, or such installations with energy infrastructure or carbon capture and storage installations, that require coastal or water-side locations, or need to be located in other high flood risk areas, in these instances the facilities should be classified as “essential infrastructure”)⁵.
More vulnerable • Hospitals. • Residential institutions such as residential care homes, children’s homes, social services homes, prisons and hostels. • Buildings used for dwelling houses, student halls of residence, drinking establishments, nightclubs and hotels. • Non–residential uses for health services, nurseries and educational establishments. • Landfill and sites used for waste management facilities for hazardous waste⁶. • Sites used for holiday or short-let caravans and camping, <i>subject to a specific warning and evacuation plan</i>.⁷
Less vulnerable • Police, ambulance and fire stations which are <i>not</i> required to be operational during flooding.

restaurants and cafes, hot food takeaways, offices, general industry, storage and distribution, non-residential institutions not included in “more vulnerable”, and assembly and leisure. • Land and buildings used for agriculture and forestry. • Waste treatment (except landfill and hazardous waste facilities). • Minerals working and processing (except for sand and gravel working). • Water treatment works which do <i>not</i> need to remain operational during times of flood. • Sewage treatment works (if adequate measures to control pollution and manage sewage during flooding events are in place).
Water-compatible development • Flood control infrastructure. • Water transmission infrastructure and pumping stations. • Sewage transmission infrastructure and pumping stations. • Sand and gravel working. • Docks, marinas and wharves. • Navigation facilities. • Ministry of Defence defence installations. • Ship building, repairing and dismantling, dockside fish processing and refrigeration and compatible activities requiring a waterside location. • Water-based recreation (excluding sleeping accommodation). • Lifeguard and coastguard stations. • Amenity open space, nature conservation and biodiversity, outdoor sports and recreation and essential facilities such as changing rooms. • Essential ancillary sleeping or residential accommodation for staff required by uses in this category, <i>subject to a specific warning and evacuation plan</i>.

Notes to table 2:

- This classification is based partly on Department for Environment, Food and Rural Affairs and Environment Agency research on *Flood Risks to People (FD2321/TR2)*⁸ and also on the need of some uses to keep functioning during flooding.
- Buildings that combine a mixture of uses should be placed into the higher of the relevant classes of flood risk sensitivity. Developments that allow uses to be distributed over the site may fall within several classes of flood risk sensitivity.
- The impact of a flood on the particular uses identified within this flood risk vulnerability classification will vary within each vulnerability class. Therefore, the flood risk management infrastructure and other risk mitigation measures needed to ensure the development is safe may differ between uses within a particular vulnerability classification.

Table 3: Flood risk vulnerability and flood zone ‘compatibility’

Flood risk vulnerability classification (see table 2)		Essential infrastructure	Water compatible	Highly vulnerable	More vulnerable	Less vulnerable
Flood zone (see table 1)	Zone 1	✓	✓	✓	✓	✓
	Zone 2	✓	✓	Exception Test required	✓	✓
	Zone 3a	Exception Test required	✓	✗	Exception Test required	✓
	Zone 3b functional floodplain	Exception Test required	✓	✗	✗	✗

Key: ✓ Development is appropriate.
 ✗ Development should not be permitted.

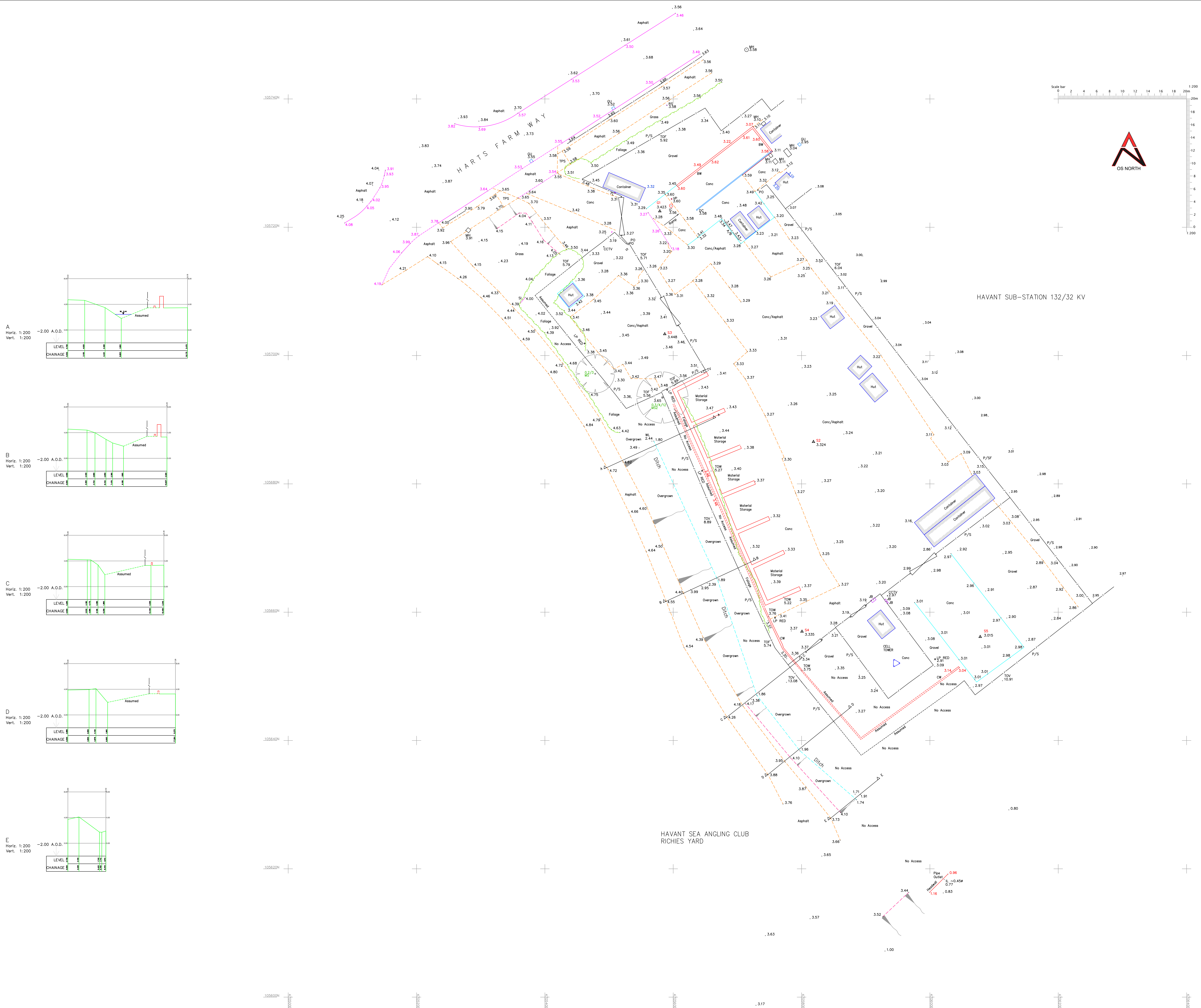
Notes to table 3:

This table does not show:

- the application of the Sequential Test which guides development to Flood Zone 1 first, then Zone 2, and then Zone 3;
- flood risk assessment requirements; or
- the policy aims for each flood zone.

Appendix B

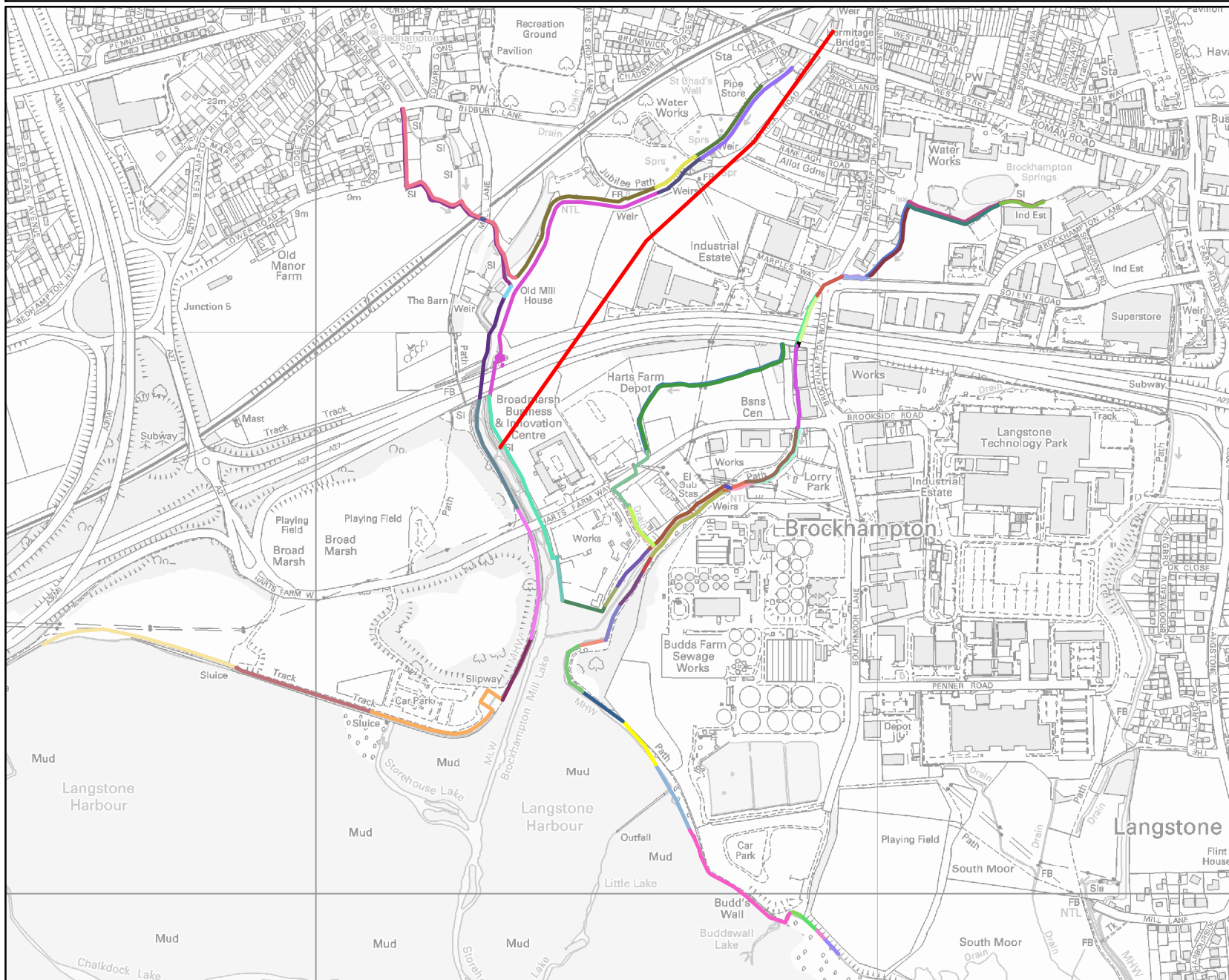
Surveys

[illegible]

Appendix C

Flood Information

Defence map Centred on NGR (SU 70548 05708) - Created 2 August 2021

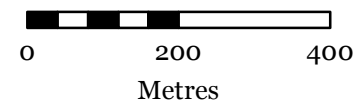


Legend

ASSET_ID	23400	23498	178053
	49555	49053	178054
	135511	49054	179212
	332622	49549	179213
ASSET_ID	127046	49554	179215
ASSET_ID	19072	97827	179216
	19073	113661	179217
	19261	113663	179218
	19262	115436	179219
	22804	119545	183343
	22893	135510	183517
	22926	135709	460482
	22927	143014	460483
	23309	144364	460690
	23310	157921	460823
	23399	178042	461178
	23402	178043	462501
	23403	178044	462502
	23404	178045	462503
	23497	178051	462504
		178052	

1:10,000 *

*when printed at A4.



Asset Id	Asset Sub-type	Length (m)	Asset Maintainer	Actual Condition	Standard of Protect (Years)	Last Inspection Date
127046	simple_culvert	953.17	environment_agency	3	5	24/08/2020
462504	high_ground	131.17	coastal	unknown	No Data	No Data
49053	high_ground	141.81	fluvial	unknown	No Data	No Data
462501	high_ground	24.9	coastal	unknown	No Data	No Data
49553	high_ground	10.01	fluvial	unknown	No Data	No Data
23310	high_ground	10.32	fluvial	unknown	No Data	No Data
157921	embankment	34.82	tidal	unknown	No Data	No Data
183343	wall	23.91	tidal	unknown	No Data	No Data
183517	embankment	33.54	tidal	unknown	No Data	No Data
461178	high_ground	266.68	coastal	unknown	No Data	No Data
462503	high_ground	94.77	coastal	unknown	No Data	No Data
462502	high_ground	85.72	coastal	unknown	No Data	No Data
179213	beach	49.33	tidal	unknown	No Data	No Data
179214	high_ground	70.01	tidal	unknown	No Data	No Data
179219	high_ground	86.29	tidal	unknown	No Data	No Data
178042	high_ground	41.01	tidal	unknown	No Data	No Data
179215	high_ground	71.91	tidal	unknown	No Data	No Data
178043	embankment	87.06	tidal	unknown	No Data	No Data
179216	high_ground	30.52	tidal	unknown	No Data	No Data
179217	high_ground	176.14	tidal	unknown	No Data	No Data
178044	high_ground	179.58	tidal	unknown	No Data	No Data
135510	high_ground	84.87	tidal	unknown	No Data	No Data
135709	high_ground	84.6	tidal	unknown	No Data	No Data
179218	high_ground	10.8	tidal	unknown	No Data	No Data
23309	high_ground	41.94	fluvial	unknown	No Data	No Data
23399	high_ground	30.58	fluvial	unknown	No Data	No Data
178045	high_ground	8.02	tidal	unknown	No Data	No Data
19072	high_ground	148.85	fluvial	unknown	No Data	No Data
113663	high_ground	384.85	fluvial	unknown	No Data	No Data
113661	high_ground	382.88	fluvial	unknown	No Data	No Data
23497	embankment	578.61	fluvial	unknown	No Data	No Data
115436	high_ground	344.51	fluvial	unknown	No Data	No Data
22926	high_ground	100.32	fluvial	unknown	No Data	No Data
22927	high_ground	174.58	fluvial	unknown	No Data	No Data
19261	high_ground	230.94	fluvial	unknown	No Data	No Data
19073	high_ground	85.79	fluvial	unknown	No Data	No Data
119545	embankment	84.76	fluvial	unknown	No Data	No Data
49054	high_ground	49.44	fluvial	unknown	No Data	No Data
23402	high_ground	54.56	fluvial	unknown	No Data	No Data
97827	high_ground	159.75	fluvial	unknown	No Data	No Data
49554	wall	150.84	fluvial	unknown	No Data	No Data
22893	high_ground	178.81	fluvial	unknown	No Data	No Data
23403	high_ground	178.33	fluvial	unknown	No Data	No Data
49549	wall	80.06	fluvial	unknown	No Data	No Data
23404	high_ground	80.17	fluvial	unknown	No Data	No Data

19262	high_ground	89.59	fluvial	unknown	No Data	No Data
460690	high_ground	358.57	coastal	unknown	No Data	No Data
460483	high_ground	254.48	coastal	unknown	No Data	No Data
460482	high_ground	318.44	coastal	unknown	No Data	No Data
144364	high_ground	448.39	fluvial	unknown	No Data	No Data
143014	high_ground	442.29	fluvial	unknown	No Data	No Data
178054	high_ground	219.51	tidal	unknown	No Data	No Data
23498	high_ground	187.3	fluvial	unknown	No Data	No Data
178052	high_ground	320.36	tidal	unknown	No Data	No Data
460823	high_ground	121.33	coastal	unknown	No Data	No Data
22804	wall	21.82	fluvial	unknown	No Data	No Data
178053	high_ground	235.73	tidal	unknown	No Data	No Data
178051	high_ground	77.86	tidal	unknown	No Data	No Data
179212	embankment	104.73	tidal	unknown	No Data	No Data
332622	simple_culvert	5.06	private	5	No Data	12/08/2020
49555	simple_culvert	57.46	private	5	40	19/05/2020
135511	simple_culvert	142.74	private	5	20	19/05/2020
23400	simple_culvert	146.48	private	5	40	19/05/2020

Flood Map for Planning (Rivers and Sea) - Centred on NGR (SU 70548 05709) - Created 2 August 2021



1: 10,000

0 Metres 250



Flood Map for Planning (Rivers & Sea)

- Defences
- Flood Storage Areas
- Areas benefiting from flood defences
- Flood Zone 3
- Flood Zone 2

Flood Map Areas (assuming no defences)

Flood Zone 3 shows the area that could be affected by flooding:

- from the sea with a 1 in 200 or greater chance of happening each year
- or from a river with a 1 in 100 or greater chance of happening each year.

Flood Zone 2 shows the extent of an extreme flood from rivers or the sea with up to a 1 in 1000 chance of occurring each year.

Levels Map Centred on NGR (SU 70548 05709) - Created 2 August 2021



Legend

 Location_Point

Water Depth

Value

 High : 26.817

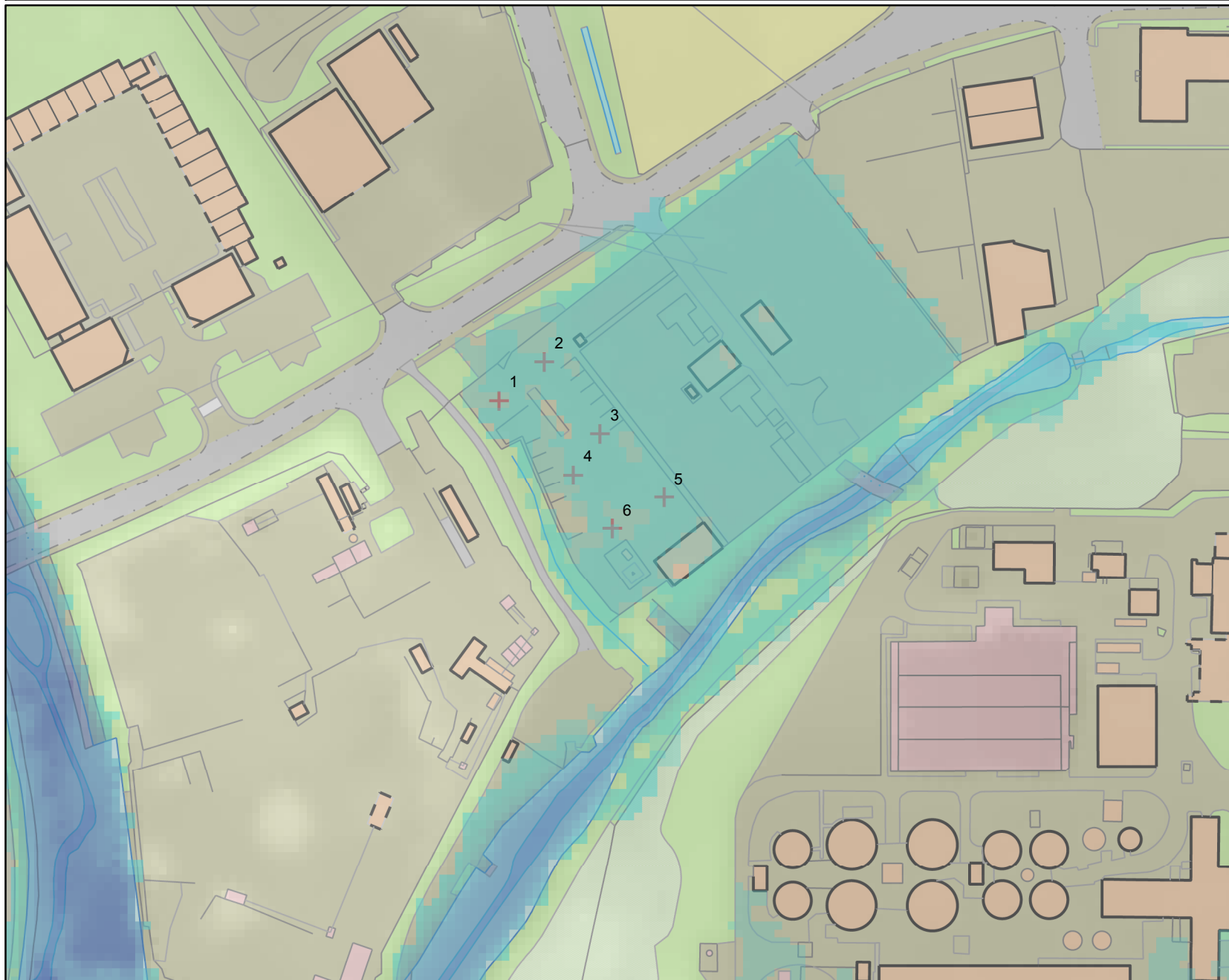
Low : 1.93721e-006

Ground Level

Value

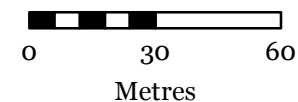
 High : 17.9869

Low : -23.1786



1:1,804 *

*when printed at A4.

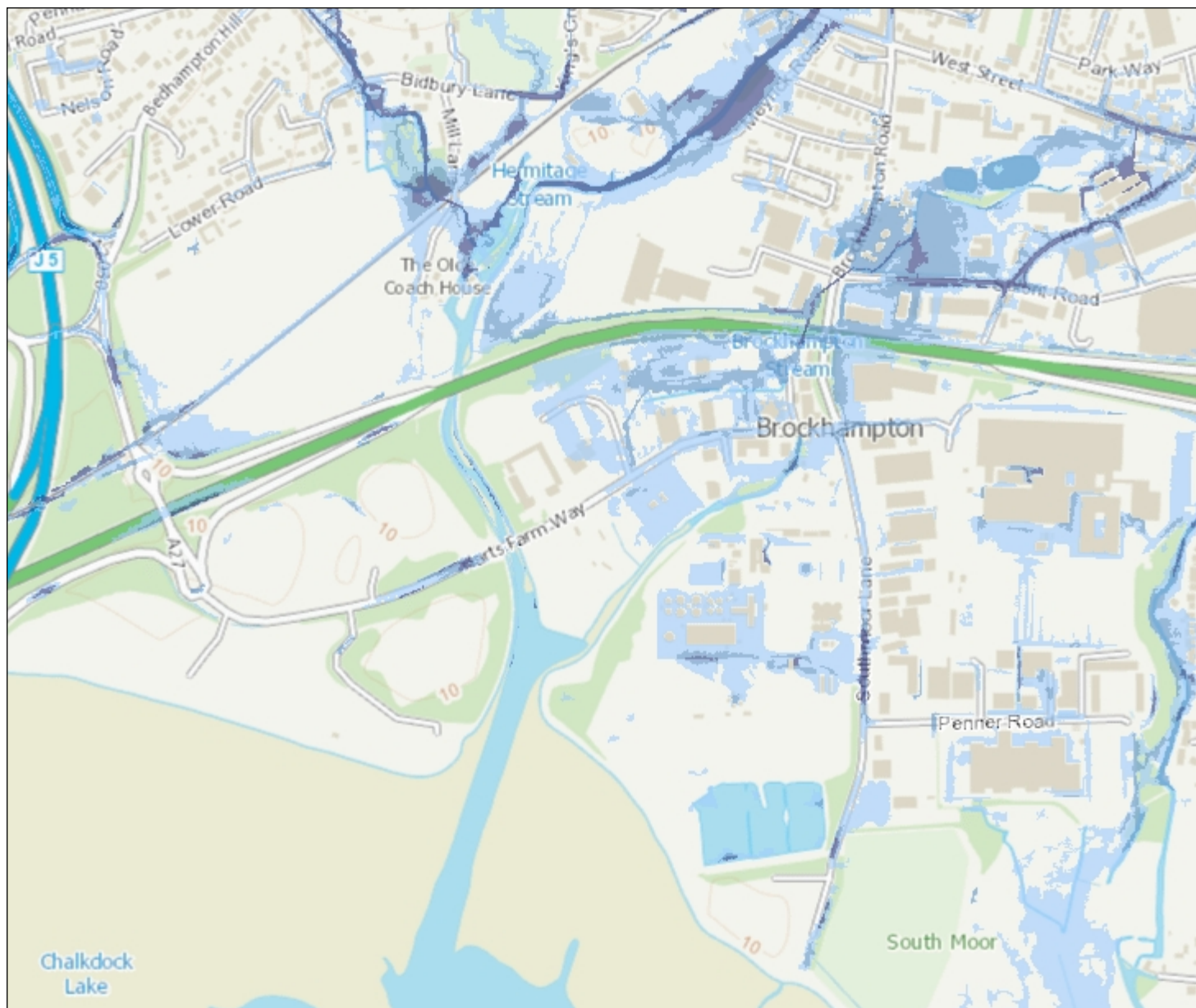


Water Depths & Levels for NGR (SU 70548 05709)

	Water Surface Level (mAOD*)			Water Depth (metres)	
Point	0.5% Annual Probability/1 in 200 Year Present Day (Flood Zone 3)	0.1% Annual Probability/1 in 1000 Year Present Day (Flood Zone 2)	Ground Level	0.5% Annual Probability/1 in 200 Year Present Day (Flood Zone 3)	0.1% Annual Probability/1 in 1000 Year Present Day (Flood Zone 2)
1	No Data	3.55	3.38	No Data	0.17
2	3.37	3.54	3.29	0.08	0.25
3	3.37	3.54	3.27	0.10	0.27
4	3.38	3.55	3.37	0.01	0.18
5	3.37	3.54	3.28	0.09	0.26
6	3.37	3.54	3.33	0.04	0.21

* Levels in metres above Ordnance Datum Newlyn

Risk of flooding from Surface Water - Centred on NGR (SU 70548 05709) - Created 2 August 2021



1: 10,000

0 Metres 250



Likelihood of flooding from Surface Water

- High ($\geq 3.3\%$)
- Medium (3.3% - 1%)
- Low (1% - 0.1%)
- Very Low
- Flood Extent 1 in 30
- Flood Extent 1 in 100
- Flood Extent 1 in 1000

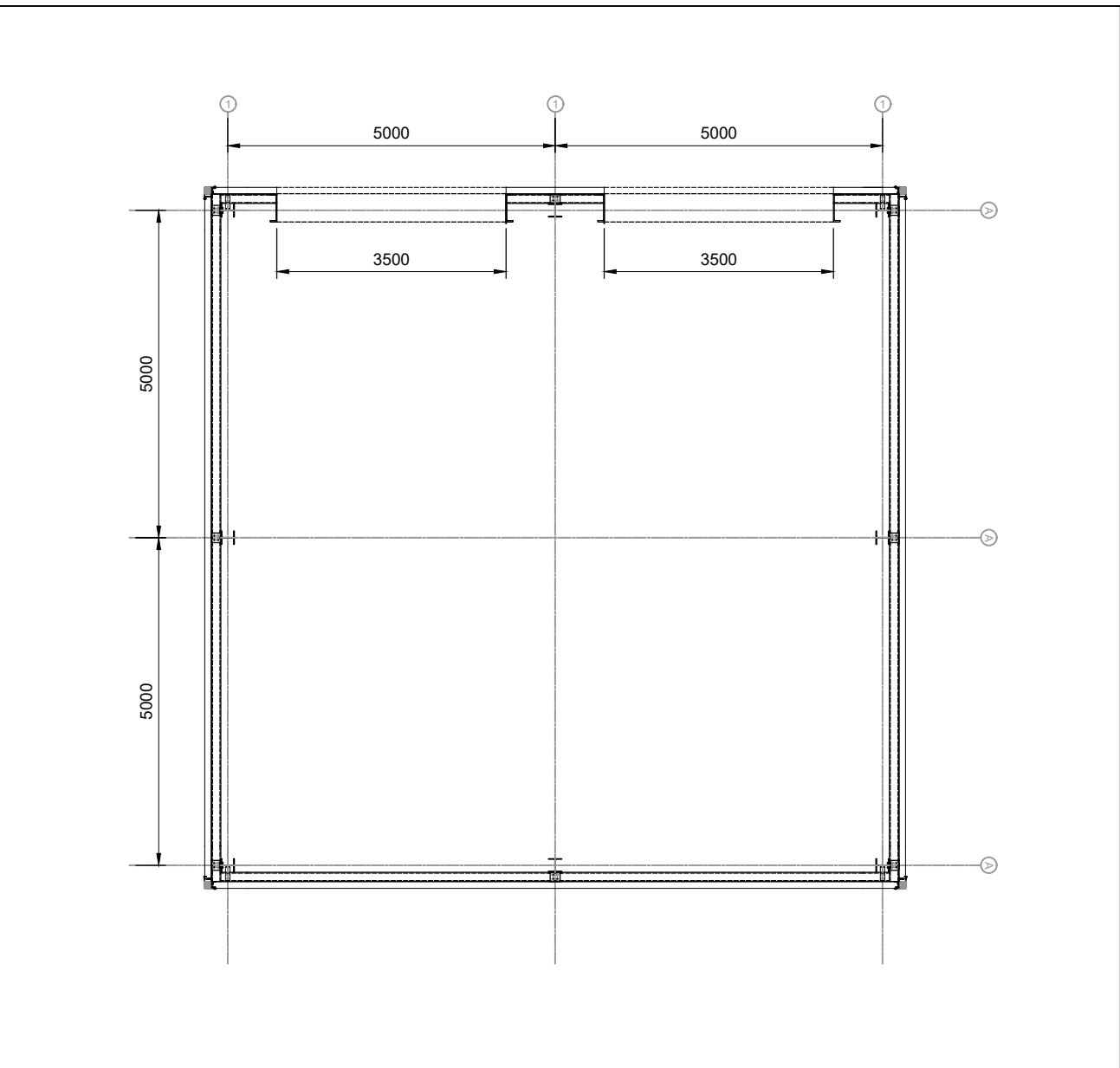
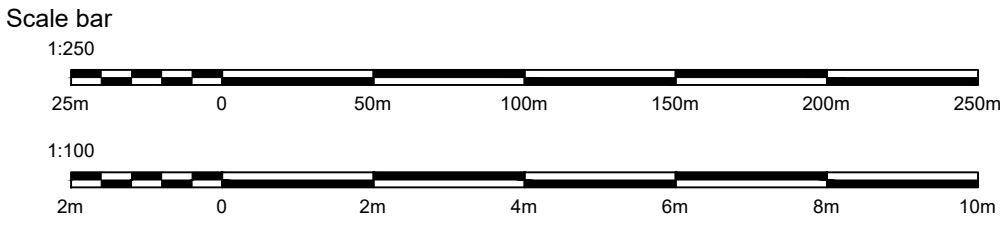
Likelihood of flooding from Surface Water

- High: Greater than or equal to 3.3% (1 in 30) chance in any given year
- Medium: Less than 3.3% (1 in 30) but greater than or equal to 1% (1 in 100) chance in any given year
- Low: Less than 1% (1 in 100) but greater than or equal to 0.1% (1 in 1,000) chance in any given year
- Very Low: Less than 0.1% (1 in 1,000) chance in any given year

This information is shown on the Risk of Flooding from Surface Water map on GOV.UK.

Appendix D

Proposed Layouts



PROPOSED BUILDING LAYOUT
SCALE 1:100

This Drawing remains the property of Cluttons LLP January 2021 copyright ©

This drawing is to be read in conjunction with the specification and all relevant drawings.

All dimensions to be checked on site prior to commencement of any works.

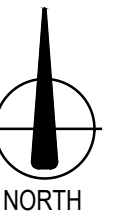
Refer any discrepancies to the surveyor.

Do not scale from this drawing.

All dimensions are in mm unless otherwise specified.

The contractor is responsible for the stability of the building and adjoining structures during construction and shall design, install, adapt and maintain all necessary propping and temporary works. A method statement for the temporary works must be submitted to the contractor administrator for comment before work begins.

DESIGN STAGE SIGN OFF
SSE Civil Project Manager :
SSE Electrical Design Engineer :
Cluttons Civil Design :



11	09.09.21	Information Issue	MO
Rev	Date	Amendment	By

Revisions

Drawing Status

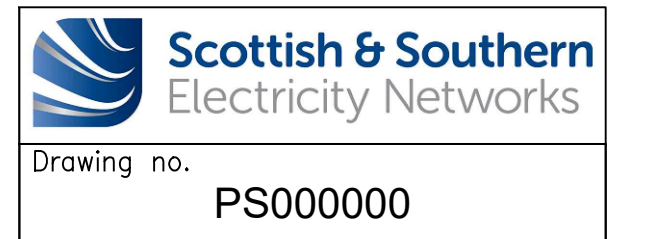
INFORMATION

Project and Building Consultancy
Cluttons LLP, First Floor, 7400 The Quorum,
Alec Issigonis Way, Oxford Business Park,
Oxford, OX4 2JZ
Tel No: 01865 728000

www.cluttons.com

Project
Fleet Workshop
Harts Farm Way
Havant PO9 1HS

Client



Drawing
Preliminary GA Plan

Scale	As indicated @ A1	
Drawn By	MO	Checked By AM
Project No.	27094	Drawing No. 01
Revision	11	

CLUTTONS

Fleet Workshop
Harts Farm Way
Havant
PO9 1HS

26 July 2022

Dear Sirs

Assessment of Influence of Building on Adjacent Piped Culvert

This note comprises an assessment of the influence of the proposed Fleet Workshop on an existing adjacent underground drainage pipe of nominal diameter 300mm.

The workshop is a single-level light industrial building, supported by a reinforced concrete (RC) raft. Details are shown on the enclosed drawing no. 27094-CLT-XX-XX-D-C-00104-I01, dated 15th July 2022.

The raft is continuous under the whole building and is designed to minimize the magnitude of pressure on the underlying clayey gravel. The bearing pressure at the underside of the raft during operation of the building is expected to be no higher than 40kN/m².

The underground pipe lies closest to the proposed building at the southern corner, shown on section A-A on the drawing. A 45-degree dispersion line of loading, commonly adopted in this situation, is drawn from the bottom edge of the raft, adjacent to the pipe. This shows that the pipe is located outside the influence zone of the raft foundation.

In conclusion, the low ground pressure expected from the building's foundations, together with the location of the pipe outside the load influence zone, mean that the risk of damage to the adjacent underground pipe is very low.

Yours faithfully

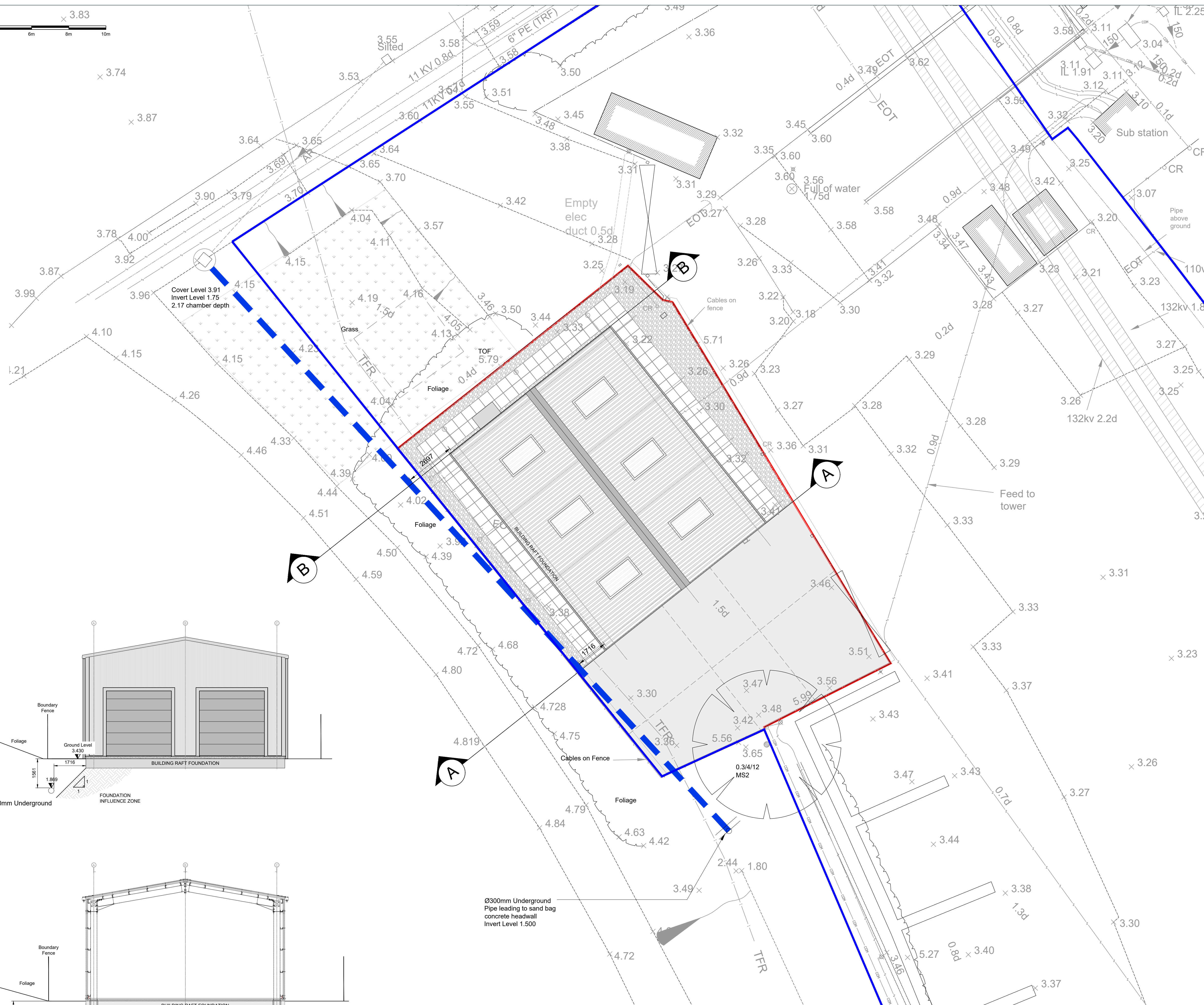


Malcolm Lyon BEng(Hons), MStructE
Senior structural engineer

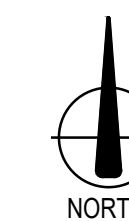
M: +44 (0) 7977 940 543
E: Malcolm.Lyon@cluttons.com
Ref: Project No. 27094

7400 The Quorum, Oxford Business Park, Oxford, OX4 2JZ
T: +44 (0) 1865 728000 | E: oxford@cluttons.com

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Registered office and head office: Portman House, 2 Portman Street, London W1H 6DU.



The contractor is responsible for the stability of the building and adjoining structures during construction and shall design, install, adapt and maintain all necessary propping and temporary works. A method statement for the temporary works must be submitted to the contractor administrator for comment before work begins.

Drawing Status

INFORMATION

www.cluttons.com

Project
Fleet Workshop
Harts Farm Way
Havant, PO9 1HS

Client



Drawing Culvert Survey

Drawn By KB Checked By JB

Scale 1:100 @ A1 Status S01

Project	Originator	Funct.	Spat.	Form	Disci.	Number	Rev
27094-CLT-XX-XX-D-C-00104-I01							

CLUTTONS

ELEVATIONAL SECTION A-A
SCALE 1:100

ELEVATIONAL SECTION B-B
SCALE 1:100