Flood Risk Assessment and Drainage Strategy for Proposed lodges

Address	**Armstrong Massey** **Site at Kellythorpe Cottages** **Beverley Road.** **Driffield** **YO25 9DN**
Client	**Armstrong Massey**
Date	**18th March 2024**

East Riding Consultants Ltd

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Document Control

Revision	Remarks	Date
A	Preliminary	18/3/24

Contents

1. Introduction

East Riding Consultants Ltd has been commissioned to prepare a flood risk assessment (FRA) for a proposed change of use of land by Armstrong Massey, at Kellythorpe Cottages, Beverley Road, Driffield. YO25 9DN.

A report is required because the proposed development is located part within flood Zone 3a. This means that local and national planning policy requires an assessment which identifies and examines flood risk at the site level and sets out measures to reduce the risk of flooding to the development and its occupants over its lifetime.

A Sustainable Drainage Strategy is required and this means that national planning and Lead Local Flood Authority (LLFA) policy must be met to ensure the development has an approved scheme for the sustainable management of surface water run-off.

This is a supplementary document to a planning application and the applicant must comply with specific requirements set out in this report and consider its recommendations to discharge any conditions imposed.

2. Methodology and Site Information

2.1 National and Local Planning Policy

This FRA complies with the requirements set out in paragraph 9 of the Technical Guide to the National Planning Policy Framework and the East Riding of Yorkshire Council Strategic Flood Risk Assessment (2019).

It will give initial consideration to:-

- Can the site be developed and flood risk mitigated
- How people and property will be kept safe from flood hazards identified
- The effect of a range of flooding events including extreme events on people and property.
- Can the site be drained for surface water and foul drainage.

2.2 Scope of Works

This FRA will:

- Assess the risk of flooding to the development
- Set out specific requirements which must be considered a part of the development.
- Set out recommendations that must properly consider

This FRA will not:

- Set out any detailed design
- Give detailed hydraulic drainage calculations

3. Sources of Data

The following publications and data sources were used in the production of this report:

- *National Flood Risk Map for Planning – Rivers and Sea*
- *National Map for Risk of Flooding from Surface Water*
- *East Riding of Yorkshire Council Strategic Flood Risk Assessment (SFRA)*
- *East Riding of Yorkshire Flood Data Mapping*
- *National Planning Policy Framework (NPPF)*
- *NPPF Technical Guidance*
- *Flood Risk Assessments Guide for New Development (FD2320/TR2)*
- *Humber defence overtopping hazard and depth maps 2014: EA 2015*
- *Water level profile 2014: EA 2015*
- *Humber breach defence scenarios 2011: EA 2011*
- *Flood Risk Assessments: Climate Change Allowances: EA 2016*

3.1 Licence Information

Contains Environment Agency information © Environment Agency and database right.
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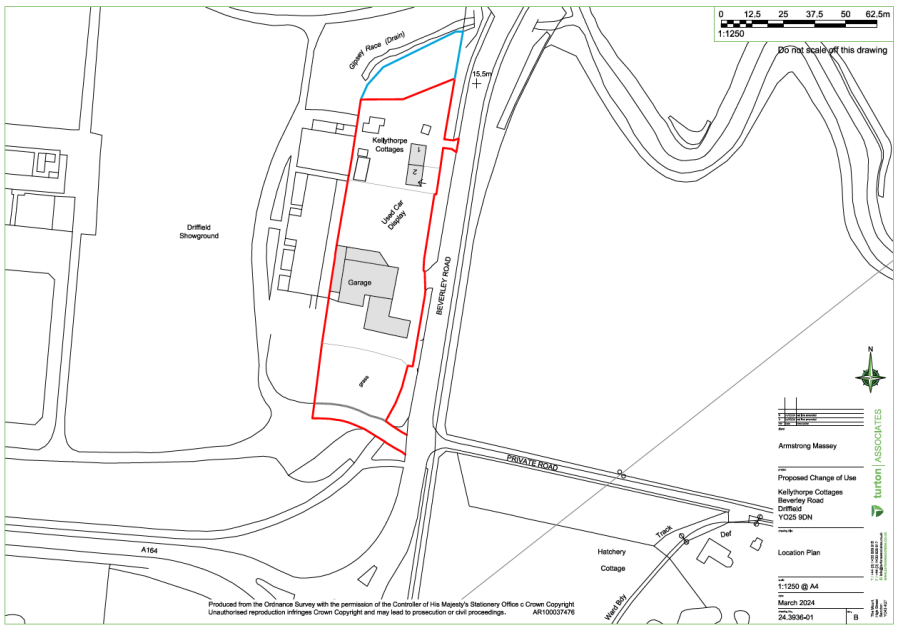
3.2 Study Area

The study area considered will be southern Driffield.

3.3 Location

The proposed development is located in the south west area of Driffield. Driffield Beck, main river, is located just north east of the site. Gipsey Race drain runs along the north east edge of the land in the ownership of Armstrong Massey.

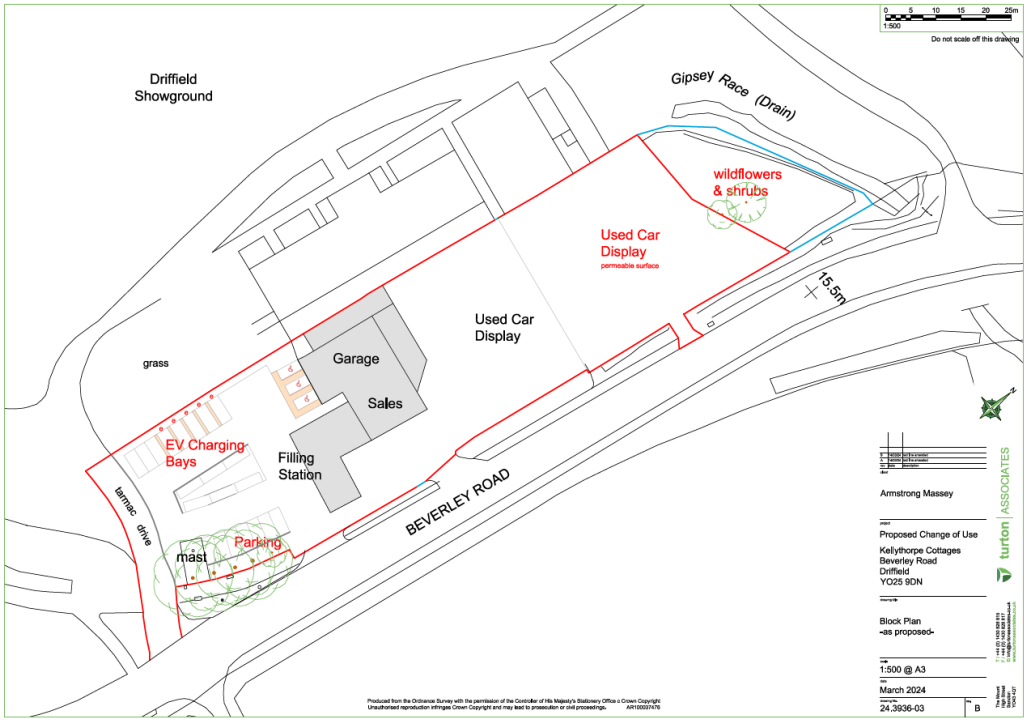
The National Grid Reference for the site is **TA 01954 56658**



3.4 Description of Proposed Development

The proposed development is classes as less vulnerable. The proposal is to extend the vehicle sales area at the north end of the site. This will require the demolition of the two existing cottages.

The Southern area will be developed to provide EV charging bays



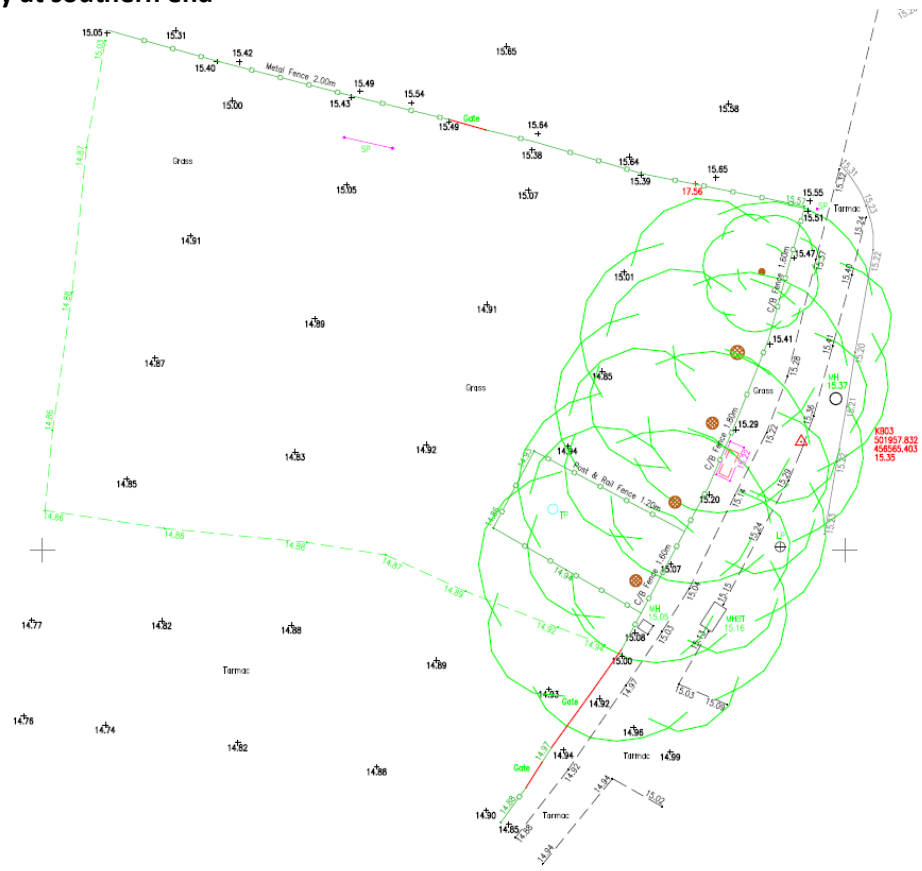
3.5 Topography

A topographical survey has been undertaken.

Survey at North End.

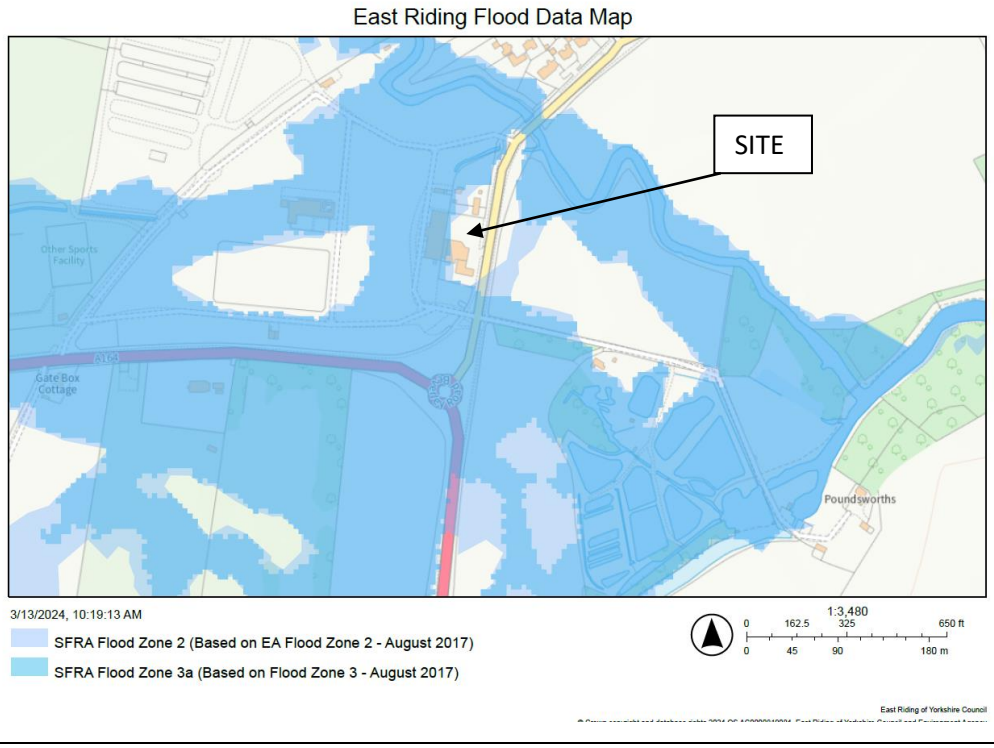
This part of the site falls towards the north end. Levels fall from an average of 15.650m AOD to an average of 15.000m AOD at the northern edge of the application site.

Survey at southern end

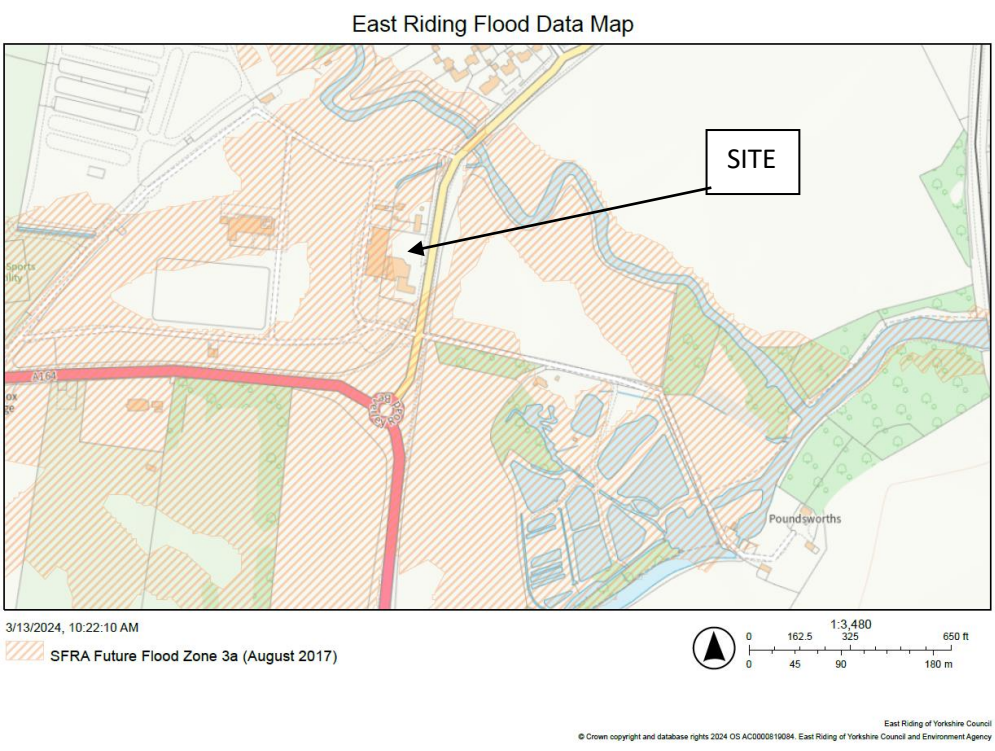


This part of the site falls towards the south. Levels fall from an average of 15.400m AOD to 14.800m AOD at the southern boundary.

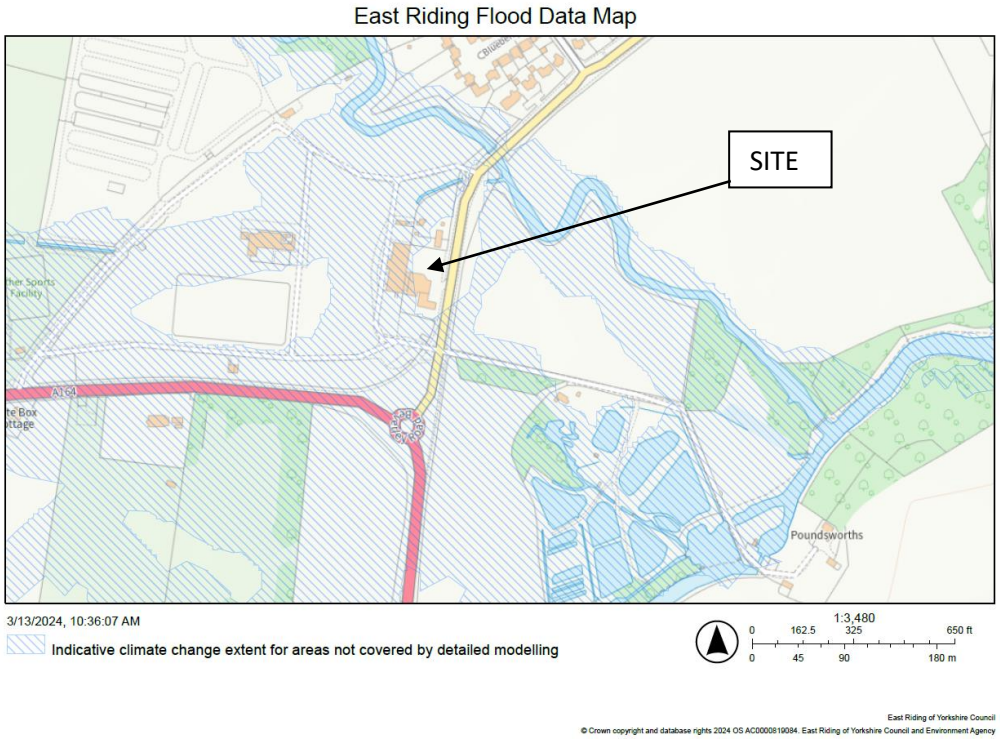
Flood Risk - Flood Risk Maps



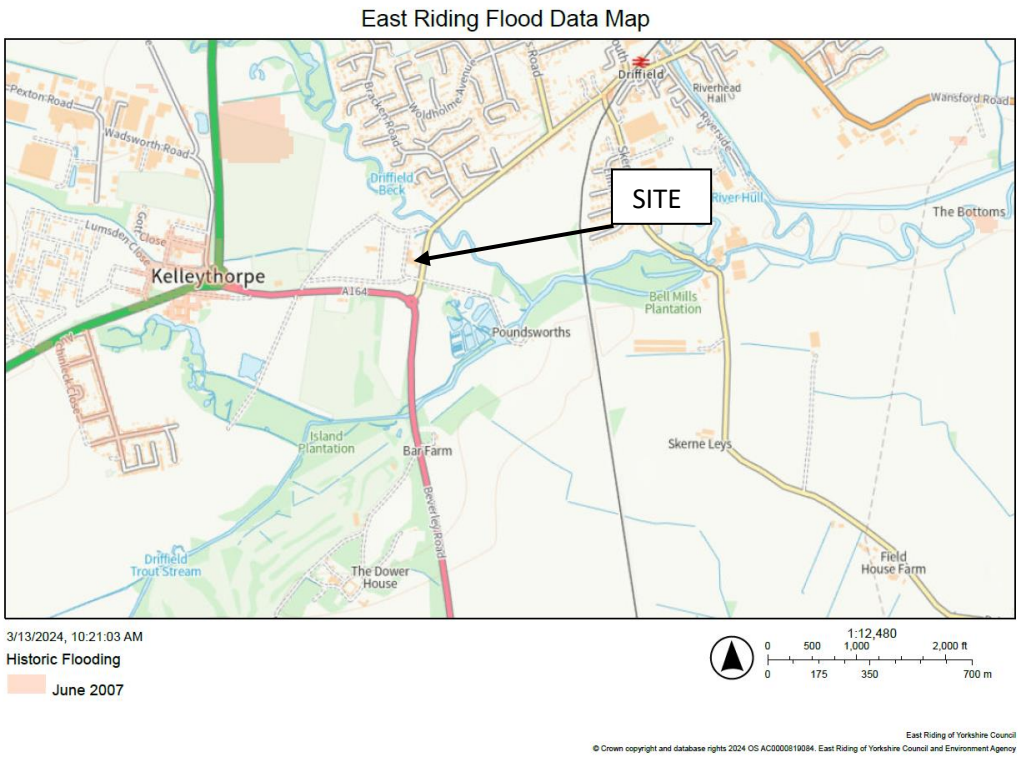
The East Riding of Yorkshire Flood Data Mapping details that the development sites are part within Flood Zone 3a



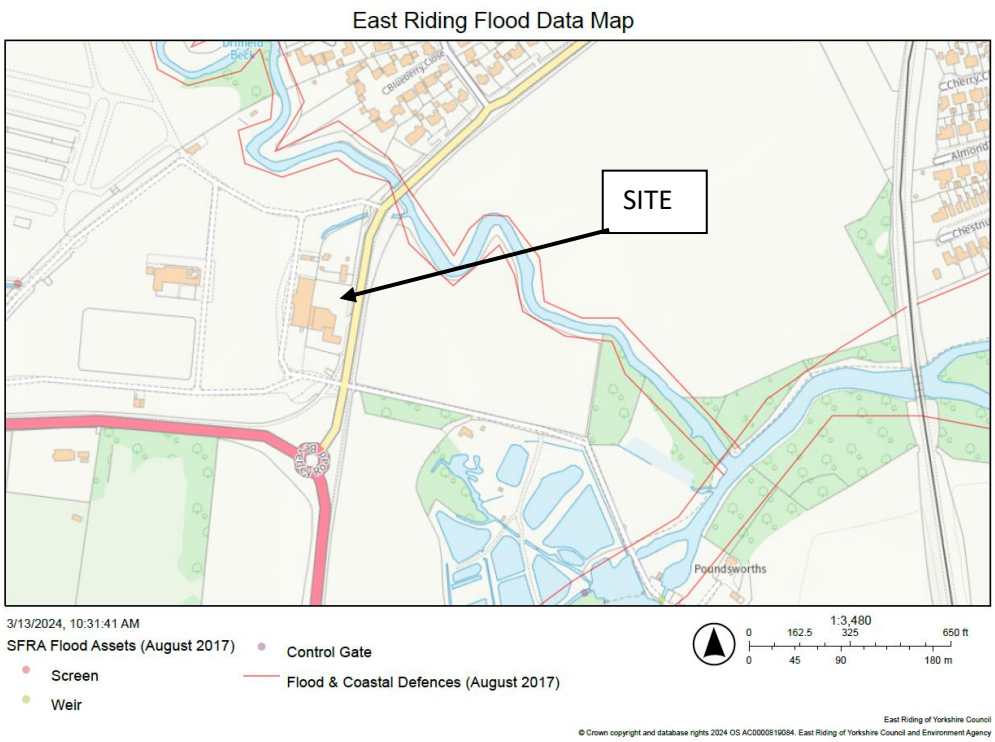
The East Riding of Yorkshire Flood Data Mapping details that the development sites are part within Future Flood Zone 3a



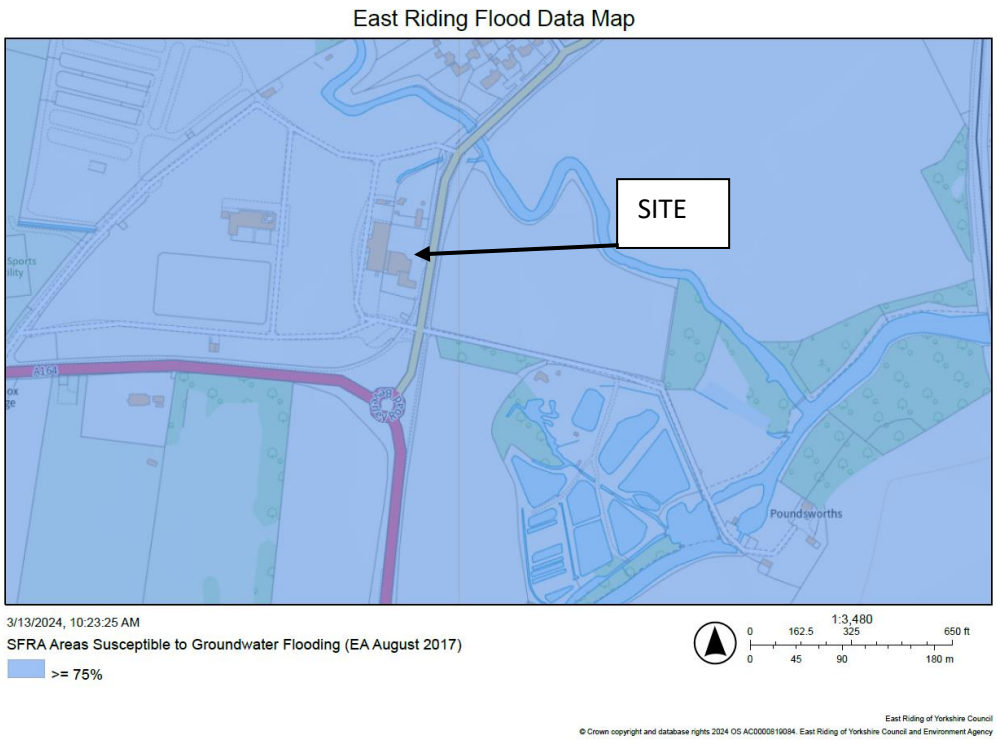
The East Riding of Yorkshire Flood Data Mapping details that the development sites may be affected by climate change.



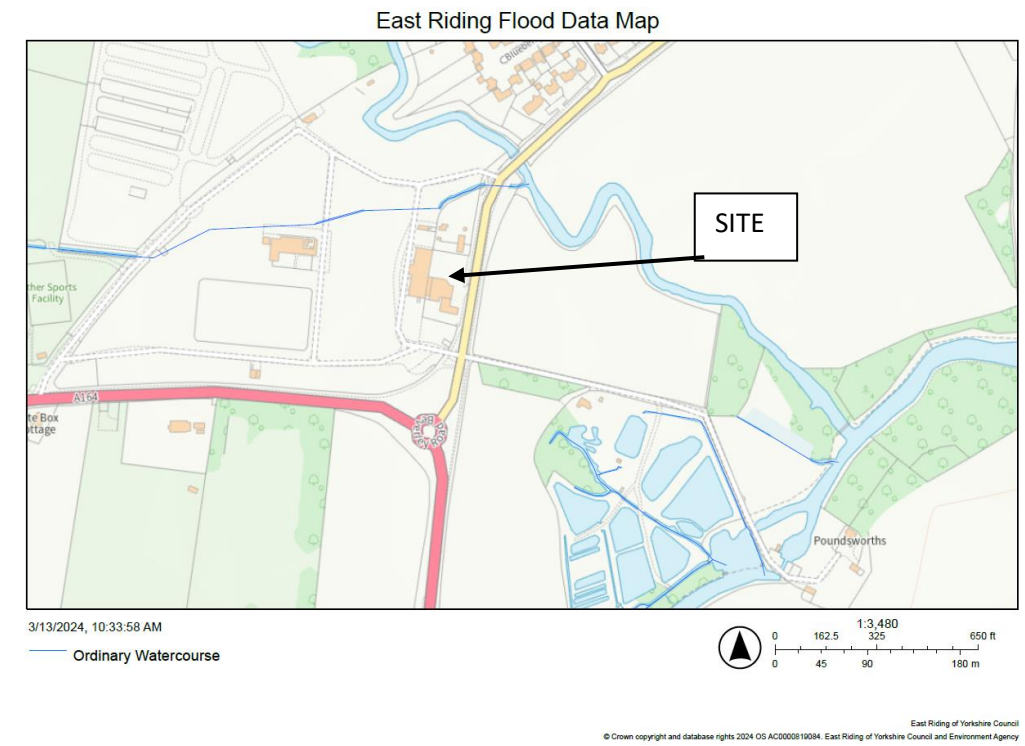
East Riding Council Flood Risk Data Mapping Shows no records of historic flooding at the site in the 2007 flood event.



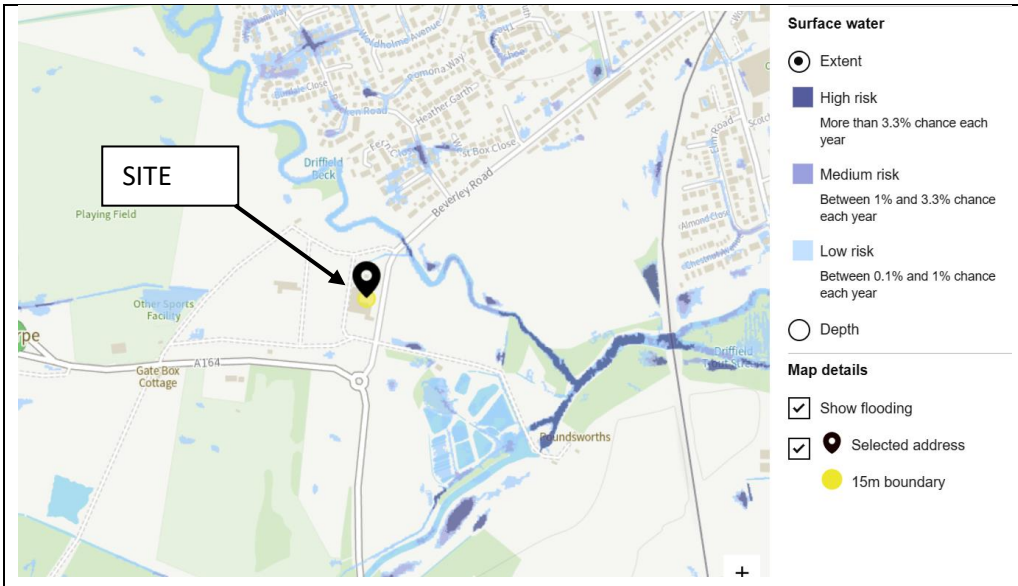
The East Riding of Yorkshire Flood Data Mapping details that the Driffield Beck benefits from defences along its banks.



East Riding Council Flood Risk Data Mapping Shows a possible greater than 75% chance of groundwater flooding. No groundwater flooding has been recorded at the site.



The East Riding of Yorkshire Flood Data Mapping details that the Gipsey Race (Ordinary Watercourse flows along the northern boundary of the land in the ownership of Armstrong Massey.



The UK Gov mapping for surface water flood risk details that the site is at very low risk of surface water flooding.

4.0 Flood Risk Map Commentary

The National flood risk map for planning – River and Sea concur with the East Riding of Yorkshire Strategic Flood Risk Assessment as identifying that part of the land is in flood risk zones 2 and 3a.
The East Riding of Yorkshire Flood Data Mapping for future flood zone 3 details that parts of the two sites could be at future risk.

The National map for flood risk from surface water indicates that the sites are at very low risk of surface water flooding.

4.1 *The Sequential and Exceptions Test*

This is an extension to the existing facilities and as such due to the operational requirements and security of their operation, it is not possible to site the development diverse from the site. Users will have access to the existing building that is located within Flood Zone 1, in the event of a flood.

This flood risk will demonstrate that the development will be made 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.

5 Detailed Analysis of Flood Risk

5.1 Tidal or Sea Flooding

Because of the distance from the Humber this type of flooding will not be considered further.

5.2 Flooding from Rivers and Large Watercourses (Fluvial Flooding)

The most significant risk of flooding is from the Driffield Beck (main river) and Gipsey Race (Ordinary watercourse). There has been no recorded flooding from the river in the vicinity of the site.

5.3 Flooding from Surface Water (Pluvial Flooding)

The national map for surface water flooding indicates the sites to be at very low risk.

No other significant local sources of flooding are identified.

5.4 Flooding from Groundwater

Groundwater flooding is possible with an estimated chance of >75%.

5.5 Flooding from other Local Sources

There are no other significant risks from other local sources identified.

5.6 Flooding from the Development Site Itself

Any proposed development will increase impermeable area. There is an increased flood risk to the local neighbourhood and the site itself unless sustainable measures are incorporated into the design of the site. These measures will comply with the policy of the LLFA and LPA.
It is proposed that the sales area will have a pervious finish. This will reduce the surface water discharge since the two existing buildings will be demolished and result in a reduced discharge from the site.
It is intended that the proposed EV charging bays and associated parking will have a positive discharge into the existing drainage system, but surface water will be retarded and discharged at an agreed rate with the LLFA. The system will be designed to cater for a 1 in 100 year event with a 30% climate change allowance.

6 Conclusion and proposed drainage strategy

Analysis suggests that the site is developable and the most significant risk is due to fluvial flooding due to overtopping of the Driffield Beck or out of channel fluvial flow from Gipsey Race. The risk from Driffied Beck is significantly mitigated due to the provision of defences along the banks. From the Contours it appears that the site is at least 1.5m above land levels adjacent to the Beck. Any flooding from the Beck would flow to lower land prior to affecting the site. The boundary of the flood zone 3 and future flood Zone 3 appears to follow a contour of 15.500m AOD. This could in theory, result in approx. 500mm of flooding at the north area proposed for the sales. In the event of a flood it is recommended that any vehicles are moved to the existing area of the site within flood zone 1.

With the boundary of Flood Zone 3 at 15.500m AOD, the proposed EV bays could be at risk of 600mm of flooding. Average ground level in this area is at 14.900m AOD. The proposed EV charging points are on raised pillars and should flooding occur, the area should be barriered off to avoid vehicles being stranded. Power to the EV units should be switched off until flood water recedes.

There should be no raising of the site and all finished surfaces should be at existing ground level. This will avoid the need to provide compensatory storage for any loss of flood volume within Flood Zone 3.

6.1 Sustainable Drainage System (SuDS).

Soakaway tests will be undertaken to determine if this method of drainage will work for the site, however due to the possibility of groundwater emergence, this may preclude this method of drainage. It is intended that the sales area will have a pervious surface and water will permeate to the Gipsey Race, mimicking agricultural run off. Surface water from the existing cottages may discharge direct to the Gipsey race (This is to be confirmed by a drainage survey prior to any demolition works) and if this is the case, the introduction of a pervious surface for the area, will reduce the rate of discharge from the site.

The southern area of the site is currently Greenfield and any new drainage system should try to mimic existing run off. Storage will be provided to cater for the 1 in 100 year rainfall event with an additional 30% for climate change. A survey of the existing drainage system serving the fuel station must be undertaken to determine the rate and points of discharge. This will determine any available capacity within the existing drainage system. The proposed discharge

rate must be agreed with the Lead Local Flood Authority and/or Yorkshire Water, if the final discharge is to public sewer.

Careful consideration needs to be given to incorporating SuDS infrastructure into the development. The following is preliminary advice and the designer should consult with specialists to undertake detailed design and hydraulic calculations

The following design criteria need to be considered:

- The layout of the development should present as little impermeable area as possible in the first instance, e.g. avoid the use of impervious paved surfaces.
- Source Control

  Manage rainwater and possibly consider the use of rainwater harvesting so water can be reused in the washing of vehicles.
- *Site Control*

  If a drainage network is required consider how the components of that network can slow and filter the water. Keep the water as close to the surface as possible, e.g. through the use of swales.
- Regional Control

  Before discharge to an off-site watercourse or sewer, consider the installation of a SuDS attenuation system.

The site owner has rights to discharge to the Gipsey Race watercourse as they are a riparian owner. Any proposed discharge will require the Consent for an outfall structure from East Riding of Yorkshire Council as Land Drainage Authority. The site is not in an Internal Drainage Board district.

6.2 Flood Emergency

Upon receiving news of a flood, Power to the EV pillars must be switched off and any vehicles in danger removed. it is recommended that initially the employees or member of the public on site, take refuge in the existing building located within flood zone 1 and await further instructions.

Report Ends