



PROPOSED ELECTRICAL VEHICLE CHARGING POINTS AT READING GATE RETAIL PARK, READING, BERKSHIRE

FLOOD RISK ASSESSMENT

MARCH 2025

REPORT REF: 3698/RE/03-25/01

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CONTRACT

Evans Rivers and Coastal Ltd has been commissioned by Swarco Smart Charging Ltd to carry out a Flood Risk Assessment for proposed electrical vehicle charging points at Reading Gate Retail Park, Reading, Berkshire.

QUALITY ASSURANCE, ENVIRONMENT AND HEALTH AND SAFETY

Evans Rivers and Coastal Ltd operates a Quality Assurance, Environmental, and Health and Safety Policy.

This project comprises various stages including data collection; depth analysis; and reporting. Quality will be maintained throughout the project by producing specific methodologies for each work stage. Quality will also be maintained by providing specifications to third parties such as surveyors; initiating internal quality procedures including the validation of third party deliverables; creation of an audit trail to record any changes made; and document control using a database and correspondence log file system.

To adhere to the Environmental Policy, data will be obtained and issued in electronic format and alternatively by post. Paper use will also be minimised by communicating via email or telephone where possible. Documents and drawings will be transferred in electronic format where possible and all waste paper will be recycled. Meetings away from the office of Evans Rivers and Coastal Ltd will be minimised to prevent unnecessary travel, however for those meetings deemed essential, public transport will be used in preference to car journeys.

The project will follow the commitment and objectives outlined in the Health and Safety Policy operated by Evans Rivers and Coastal Ltd. All employees will be equipped with suitable personal protective equipment prior to any site visits and a risk assessment will be completed and checked before any site visit. Other factors which have been taken into consideration are the wider safety of the public whilst operating on site, and the importance of safety when working close to a water source and highway. Any designs resulting from this project and directly created by Evans Rivers and Coastal Ltd will also take into account safety measures within a "designers risk assessment".

Report carried out by:

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DISCLAIMER

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1. INTRODUCTION

1.1 Project Scope

- 1.1.1 Evans Rivers and Coastal Ltd has been commissioned by Swarco Smart Charging Ltd to carry out a Flood Risk Assessment for proposed electrical vehicle charging points at Reading Gate Retail Park, Reading, Berkshire.
- 1.1.2 It is understood that this Flood Risk Assessment will be submitted to the Planning Authority as part of a planning application. Specifically, this assessment intends to:
- a) Consider the impacts of fluvial flood events in accordance with NPPF and including updated climate change allowances;
 - b) Determine the extents of the aforementioned NPPF Flood Zones across the site, together with depths of floodwater and hazard;
 - c) Assess the risks to people and property and propose mitigation measures accordingly;
 - d) Review existing evacuation and warning procedures for the area;
 - e) Carry out an appraisal of flood risk from any other sources such as groundwater as required by NPPF;
 - f) Report findings and recommendations.
- 1.1.3 This assessment is carried out in accordance with the requirements of the National Planning Policy Framework (NPPF) dated 2024. Other documents which have been consulted include:
- DEFRA/EA document entitled *Framework and guidance for assessing and managing flood risk for new development Phase 2 (FD2320/TR2)*, 2005;
 - Communities and Local Government 2007. *Improving the Flood Performance of New Buildings*. HMSO.
 - DEFRA/EA document entitled *The flood risks to people methodology (FD2321/TR1)*, 2006;
 - EA *Supplementary Note on Flood Hazard Ratings and Thresholds for Development Planning and Control Purpose*, 2008;
 - National Planning Practice Guidance – Flood Risk and Coastal Change.
 - UK Government's climate change allowances guidance.
 - Reading Borough Council Strategic Flood Risk Assessment (SFRA) dated 2017.
 - UK Power Networks Engineering Design Standard EDS 07-0106 – Substation Flood Protection dated 2019.

2. DATA COLLECTION

2.1 To assist with this report, the data collected included:

- Ordnance Survey 1:10,000 street view map (Evans Rivers and Coastal Ltd OS licence number AC0000814628).
- 1:625,000 *Hydrogeological Map of England and Wales*, published in 1977 by the Institute of Geological Sciences (now the British Geological Survey).
- Filtered LIDAR data at 1m resolution.
- British Geological Survey, *Online Geology of Britain Viewer*.
- British Geological Survey, *Groundwater Susceptibility Map*.
- Product 5 and 6 GIS flood data from the Kennet (Tyle Mill to Thames Confluence) 2018 model received from the Environment Agency.

3. SITE CHARACTERISTICS

3.1 Existing Site Characteristics and Location

- 3.1.1 The site is located at Reading Gate Retail Park, Reading, Berkshire. The approximate Ordnance Survey (OS) grid reference for the site is 470959, 170045 and the location of the site is shown on Figure 1.

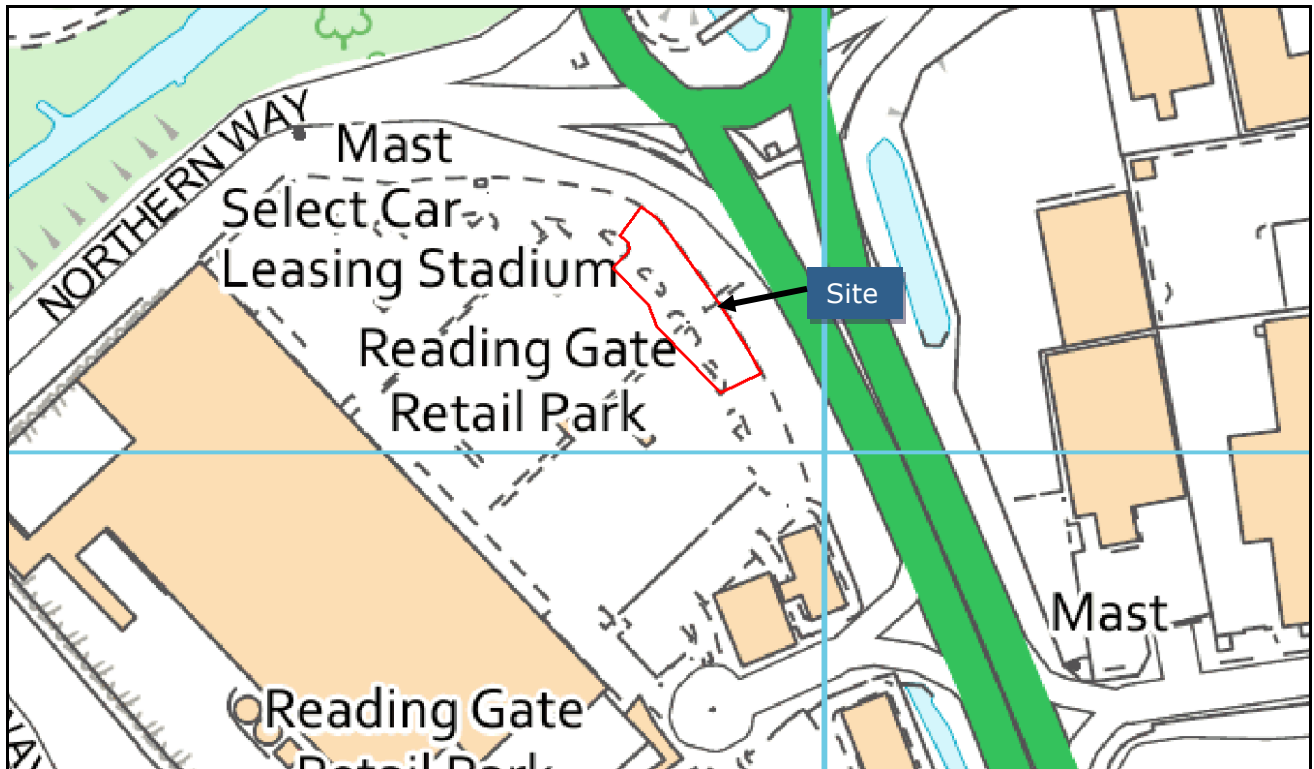


Figure 1: Site location plan (Source: Ordnance Survey)

- 3.1.2 The site forms part of the Reading Gate Retail Park and comprises an area of hardstanding used for car parking. The site is accessed from the A33 through the wider car parking area. The existing site layout can be seen on Drawing Number SI24-102-17-P-11-C.
- 3.1.3 Filtered LIDAR data at 1m resolution has been obtained in order to determine and illustrate the topography across the site and surrounding area (Figure 2).
- 3.1.4 It can be seen that ground levels across the site are set at approximately 38.90m AOD.

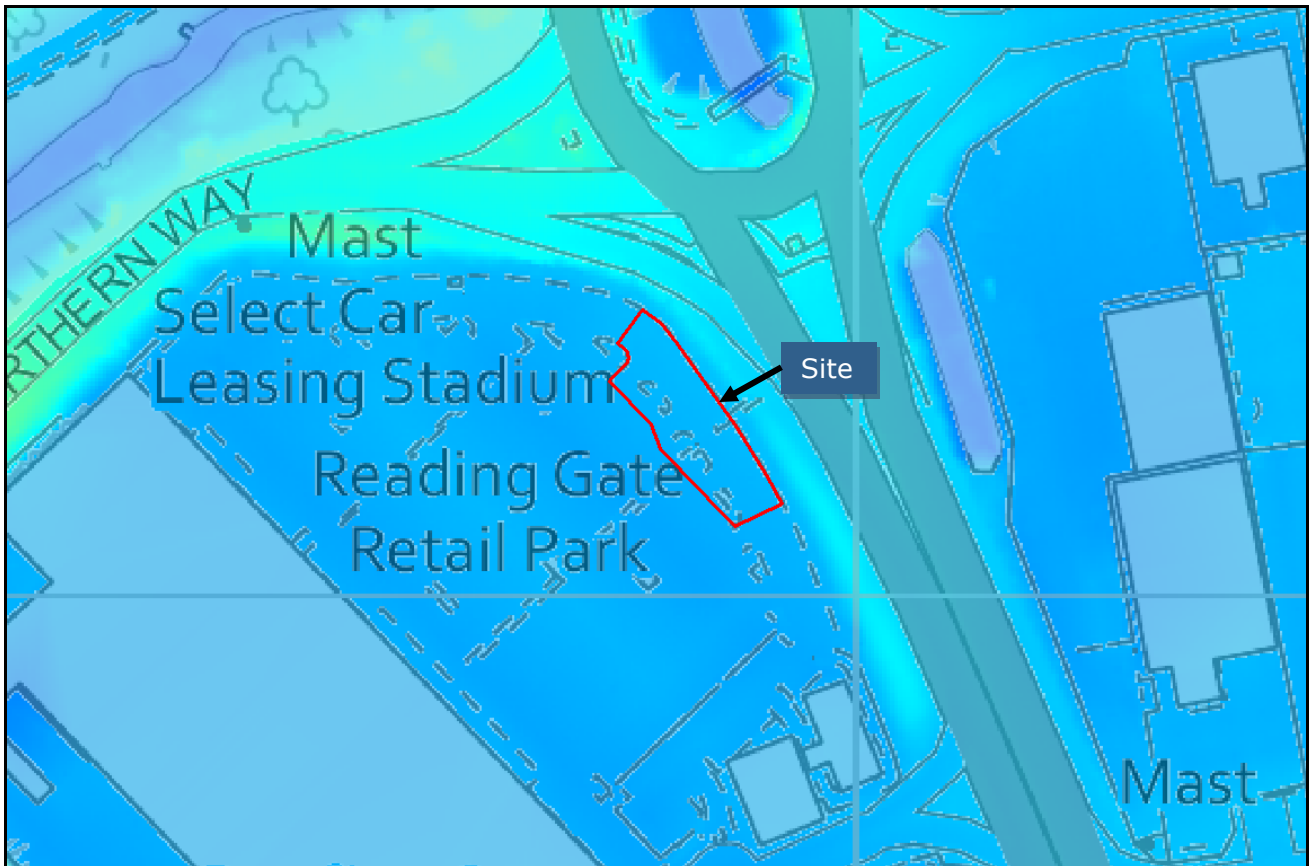


Figure 2: LIDAR survey data where higher ground is denoted as orange and yellow colours and lower areas denoted by blue and green colours

3.2 Site Proposals

- 3.2.1 It is the Client's intention to provide electric vehicle charging points across the site as shown on Drawing Number SI24-102-17-P-12-B. A substation, feeder pillar and power units will also be provided.

4. BASELINE INFORMATION

4.1 Environment Agency Flood Zone Map

4.1.1 The Environment Agency's Flood Zone Map (Figure 3) and the Map F4_S of the SFRA shows that the site is located within the NPPF defined Flood Zone 2.

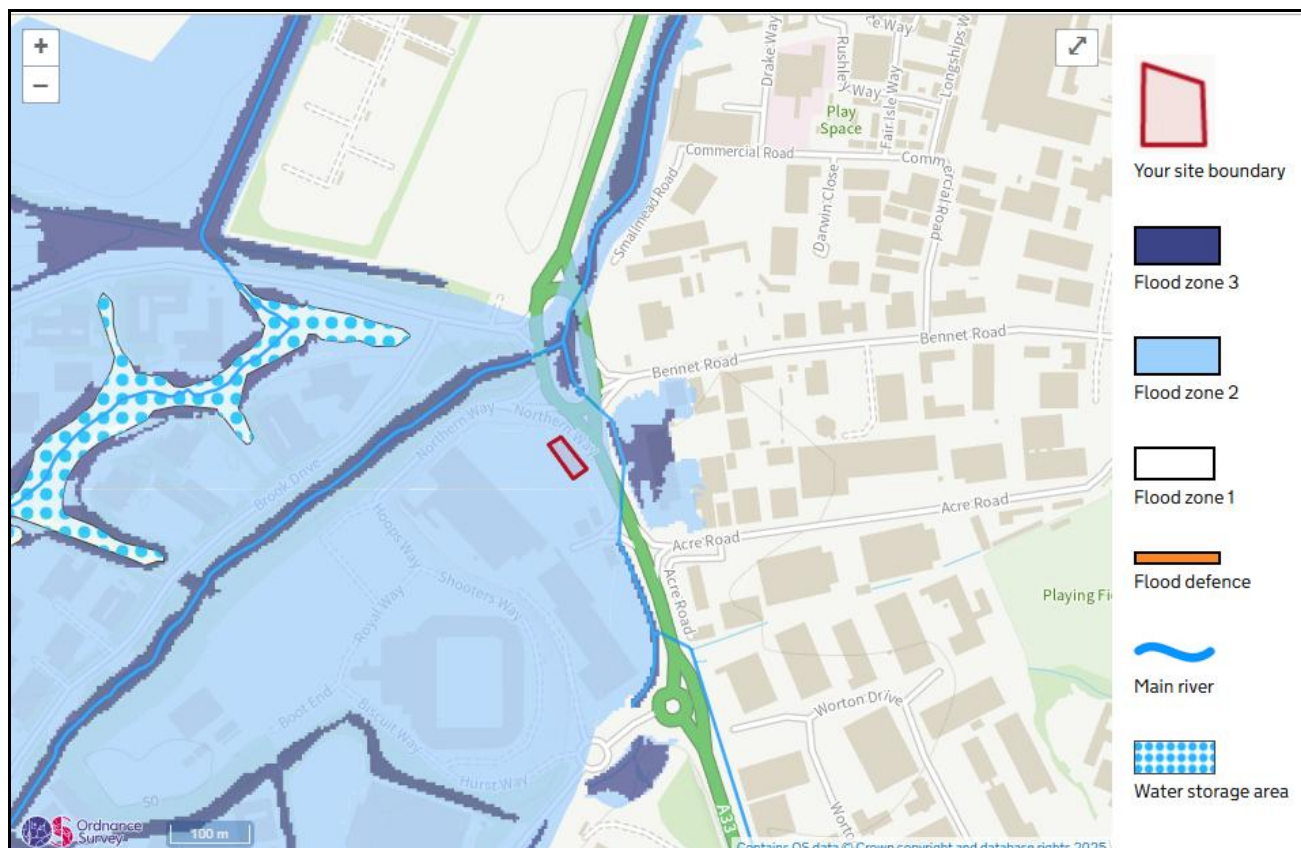


Figure 3: Environment Agency Flood Zone Map (Source: Environment Agency)

4.2 Flood Defences and Environment Agency Flood Levels

- 4.2.1 The Environment Agency flood defence information via <https://environment.data.gov.uk/asset-management/index.html> shows that there are no formal raised flood defences protecting the site, with only natural high ground dominating.
- 4.2.2 Two-dimensional fluvial GIS flood data from the Kennet (Tyle Mill to Thames Confluence) 2018 model has been provided by the Environment Agency, and are summarised in Table 1.

Table 1: 2D fluvial flood level data

1 in 30 year (mAOD)	1 in 100 year (mAOD)	1 in 100 year plus 25% climate change (mAOD)	1 in 1000 year (mAOD)
N/A	N/A	N/A	38.99

N/A = event modelled but floodwater doesn't reach site

4.2.3 The UK Government's climate change allowances guidance states that the "Central" climate change allowance should be used in FRA's. For the Kennet and Tributaries Management Catchment the climate change allowance is 21% up to year 2080s.

4.2.4 Therefore, when considering this scenario, the Agency's fluvial modelling includes a 1 in 100 plus 25% climate change allowance and can be used further in this assessment.

4.3 Flood Warning and Emergency Planning

4.3.1 The site is located within Environment Agency Flood Warning area 061FWF22FoudryBk - Foudry Brook from Stratfield Mortimer to Green Park.

4.3.2 Sites at risk of fluvial flooding could have a minimum of 2 hours warning before any of the levels of flood warning is issued.

4.3.3 Flood Alerts, Flood Warnings and Severe Flood Warnings are issued to residents and businesses within flood risk areas by the Agency's *Floodline Warnings Direct* (FWD) service. This system is managed by the Environment Agency and dials out a message to the recipient when a particular category of flood warning is being advised. The message is conveyed by a constant ringing of the telephone or can alternatively be communicated to mobile phones and computers. The system functions at all times, issuing flood warnings and alerts in conjunction with announcements on radio and other media. Owners and occupiers of dwellings or businesses thought to be at risk can sign up to the scheme. **The owners are encouraged to confirm details with the Agency and to sign up for these warnings.**

4.3.4 The various flood warning codes can be seen on Figure 4.

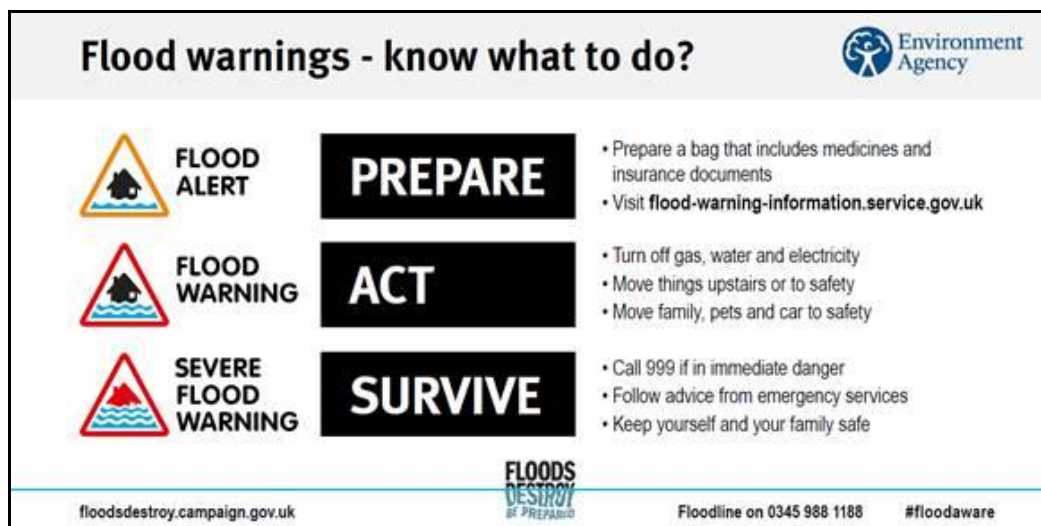


Figure 4: Flood warning codes (Source: Environment Agency)

4.3.5 It is understood that in the event of flooding, evacuation is managed by a multi-agency team in conjunction with the Police. The multi-agency team provides suitable premises for shelter, first aid, refreshments and possible transportation with consideration given to the elderly and vulnerable groups. It is essential that occupants produce robust Emergency Flood Plans to avoid putting themselves or emergency services at risk and that they do not rely solely on emergency services during the event.

5. FLUVIAL FLOOD RISK

5.1 By comparing the Agency's flood data in Table 1 above and the survey data indicates that the site would be located outside of the design climate change 1 in 100 year extent. During the extreme 1 in 1000 year event the flood depth would be 0.09m.

5.2 Figure 5 shows the mapped flood extents.

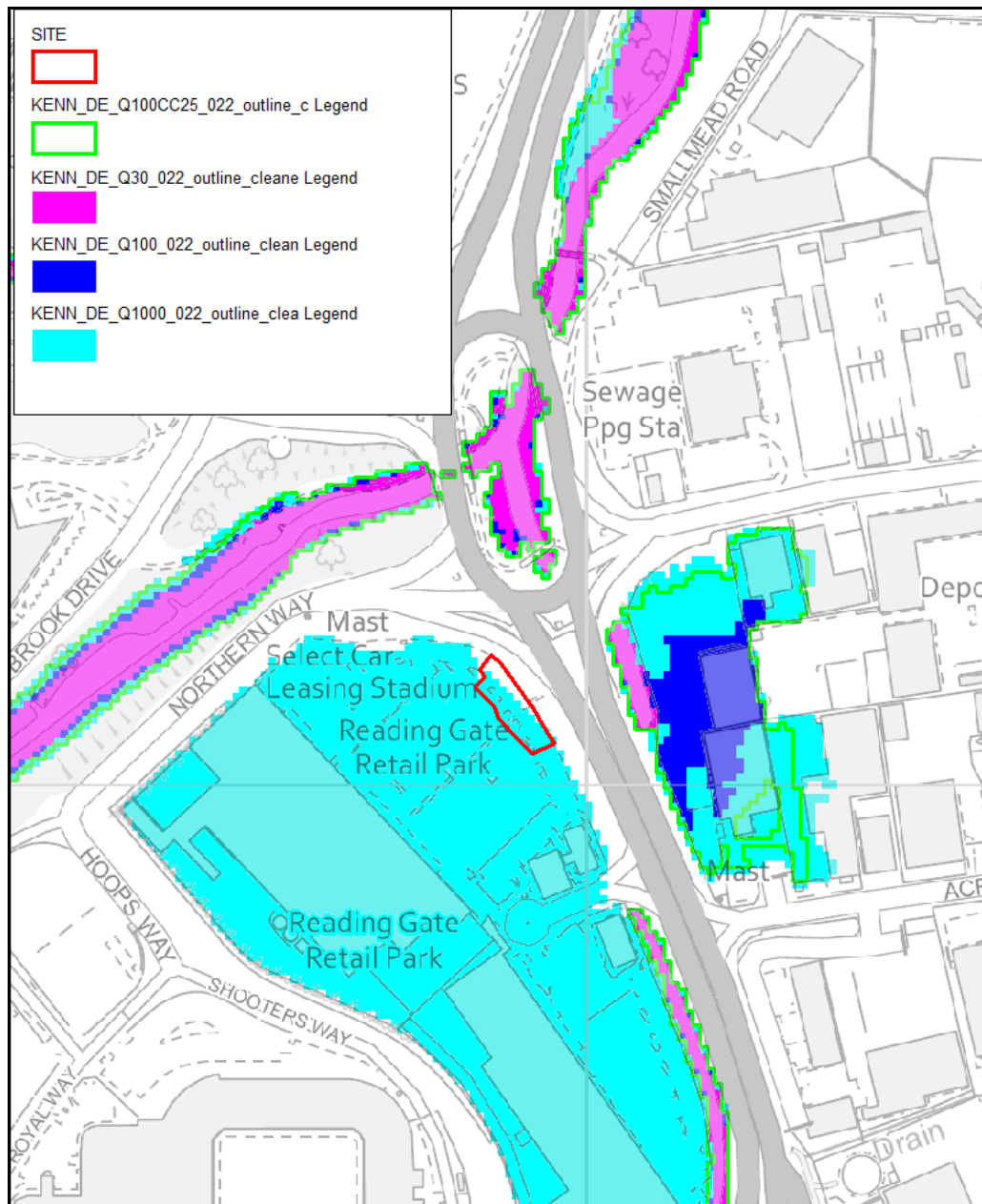


Figure 5: Mapped maximum flood extents (taken from Kennet (Tyle Mill to Thames Confluence) 2018 model)

6. FLOOD RISK MITIGATION AND EVACUATION

6.1 Reducing Exposure to the Hazard

- 6.1.1 In order to assess and reduce the exposure to the hazard and the vulnerability to the hazard after the site has been developed, the guidance outlined in the DCLG/DEFRA/EA document entitled *Flood Risk Assessment Guidance for New Development Phase 2; Flood Risks to People, Phase 2; Improving the Flood Performance of New Buildings* has been consulted.
- 6.1.2 It has been established in Chapter 5 that the site is located outside of the design climate change 1 in 100 year flood extent and that the flood depth during the extreme 1 in 1000 year event would be 0.09m.
- 6.1.3 It may not be practical to set the EV charging points and feeder pillar above the extreme flood level. Despite this, the substation will be set on a 100mm high plinth and above the extreme flood depth and prior to the onset of floodwater the remaining utilities will be shut down as part of the site flood management plan.

6.2 Reducing Vulnerability to the Hazard

- 6.2.1 Maintenance personnel will only be occupying the site infrequently and during normal working hours, and the risk will therefore be reduced. The number of visits to the site will be low and for maintenance and monitoring purposes.
- 6.2.2 It is recommended that the site owners register with Flood Warnings Direct service and ensure that they are aware of the flood risk so that they have the option to shut down the EV units and other utilities and evacuate the area upon receipt of a *Flood Warning* or upon the instruction of the emergency services.
- 6.2.3 Signs and information plaques should be located regularly across the site to inform people of the flood risk. Maintenance workers will be asked to check the Flood Warnings Direct service before visiting the site and will postpone any visit if there is a flood risk identified.
- 6.2.4 It is recommended that a *Business Flood Plan* is developed. Formal training would also be required and the plan would include information on what to do when receiving a flood warning, together with evacuation procedures and routes.

6.3 Safe Access/Egress

- 6.3.1 Figure 5 above and Figure 6 overleaf shows that safe access/egress is available during the climate change 1 in 100 year event.

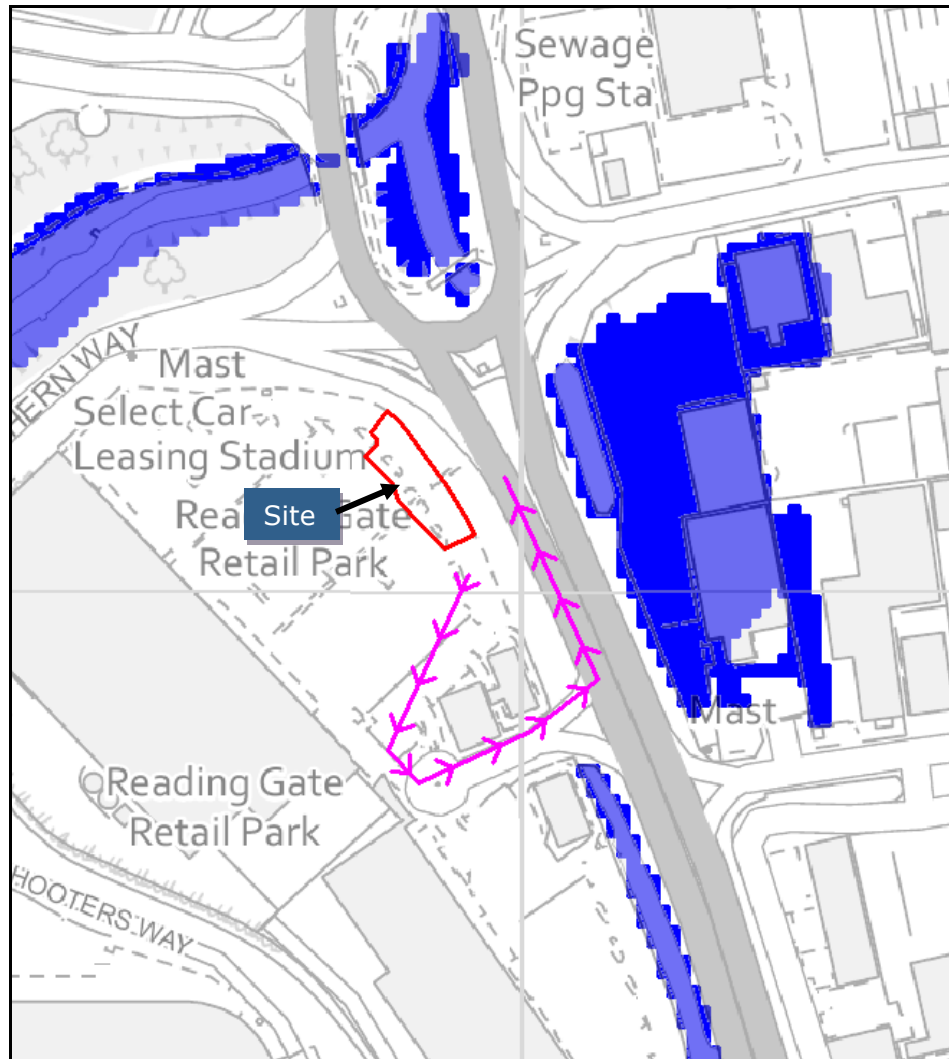


Figure 6: Preferred evacuation route in relation to 100yrCC extent

7. OTHER SOURCES OF FLOODING

7.1 Groundwater Flooding

Soil and Geology at the Site

- 7.1.1 It can be seen from the various soil and hydrogeological data, listed in Section 2, that the soil types and geology across the site comprise clay, silt, sand and gravel.

Groundwater Flooding Potential at the Site

- 7.1.2 Map F8 of the SFRA shows a >75% susceptibility to groundwater flooding.
- 7.1.3 The 'Check the long term flood risk for an area in England' at <https://www.gov.uk/check-long-term-flood-risk> states that flooding from groundwater is unlikely in this area.
- 7.1.4 It is considered that the groundwater flood risk at the site will be low as the existing hardstanding will confine the water table reducing its potential to rise.

7.2 Surface Water Flooding and Sewer Flooding

DEFRA Risk of flooding from surface water (RoFSW)

- 7.2.1 The DEFRA Risk of flooding from surface water (RoFSW) map and associated data was updated on 28th January 2025 with pdf guidance entitled *RoFSW Product Description*. It now supersedes previous datasets and can be viewed at <https://www.gov.uk/check-long-term-flood-risk> and <https://environment.data.gov.uk/explore/b5aaa28d-6eb9-460e-8d6f-43caa71fbe0e> with the raw GIS data being available at <https://environment.data.gov.uk/explore/b5aaa28d-6eb9-460e-8d6f-43caa71fbe0e?download=true>.
- 7.2.2 The DEFRA Data Services Platform states that the Risk of Flooding from Surface Water (RoFSW) map is 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.
- 7.2.3 The DEFRA Data Services Platform also states that RoFSW is a probabilistic product, meaning that it shows the overall risk, rather than the risk associated with a specific event or scenario. In externally published versions of this dataset, risk is displayed as one of four likelihood bandings:
- High - greater than or equal to 1 in 30 (3.3%) chance of flooding in any given 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 year (0.1%) chance of flooding in any given year.
 - Very Low – less than 1 in 1000 year (0.1%) chance of flooding in any given year (also denoted by the mapping as 'Unavailable').
- 7.2.4 Information has also been created which indicates the possible impacts of climate change on future risk in line with the guidance at <https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances#when-to-use-climate-change-allowance>.
- 7.2.5 For surface water flood risk the mapping considers the 'Central' allowance for the 2050s epoch (2040-2060) and can be viewed at <https://www.gov.uk/check-long-term-flood->

risk and <https://environment.data.gov.uk/explore/e5b38de2-99b3-44ee-b10c-b244926878ef>, with the raw GIS data being available at <https://environment.data.gov.uk/explore/e5b38de2-99b3-44ee-b10c-b244926878ef?download=true>.

7.2.6 The DEFRA Risk of flooding from surface water (RoFSW) map and associated data (Figures 7, 8 and 9) shows that there is a Very Low surface water flood risk at the site and when accounting for future climate change.

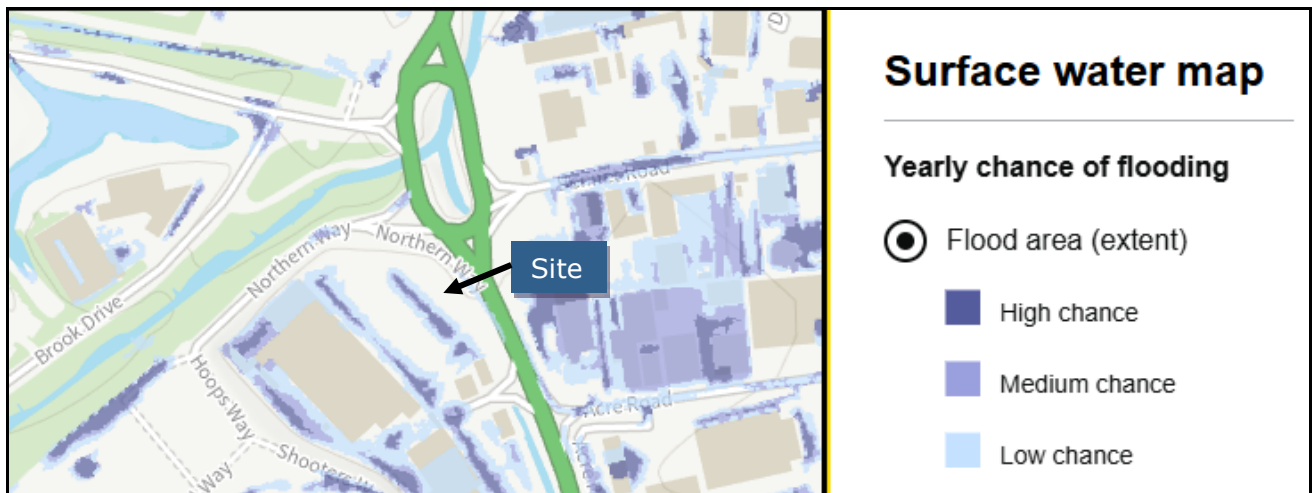


Figure 7: DEFRA Risk of flooding from surface water (RoFSW) map from
<https://www.gov.uk/check-long-term-flood-risk>

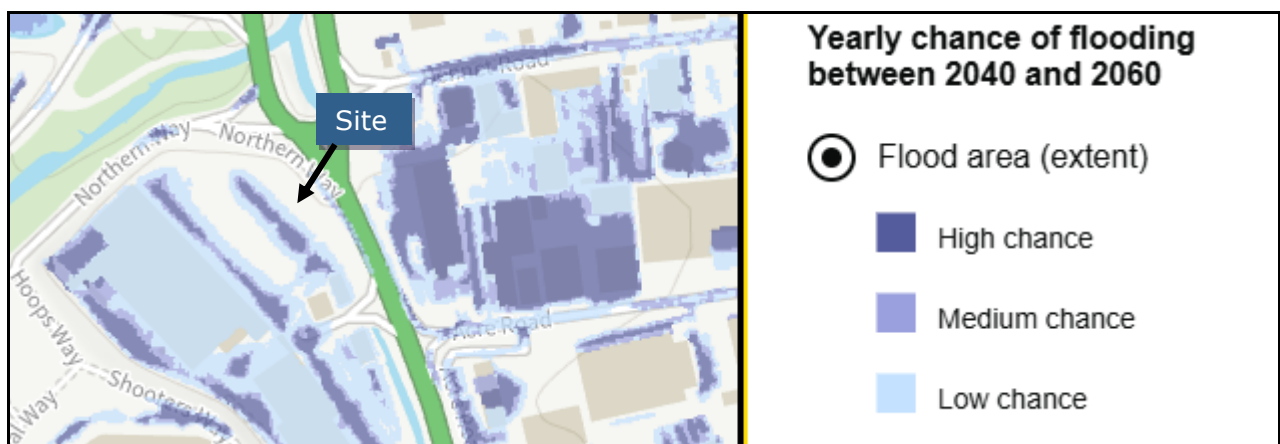


Figure 8: DEFRA Risk of flooding from surface water (RoFSW) map data with climate change from
<https://www.gov.uk/check-long-term-flood-risk>

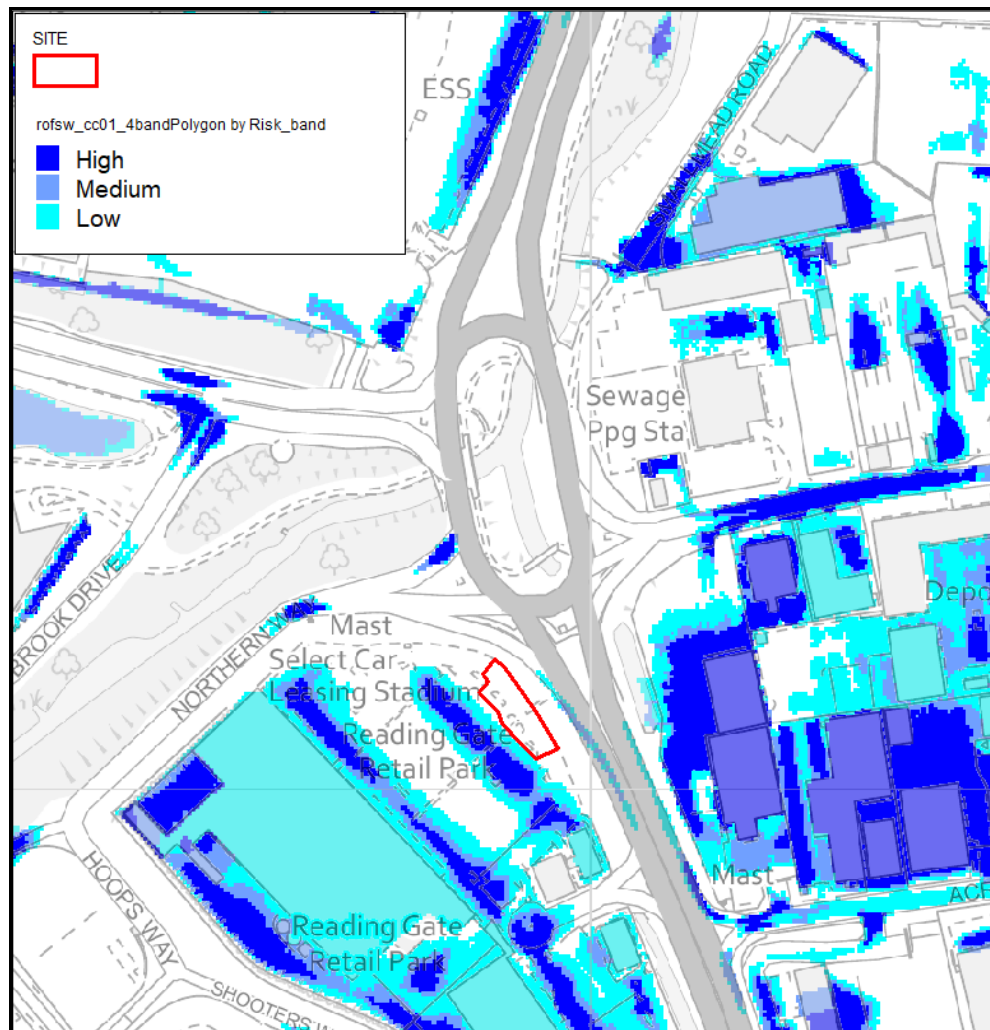


Figure 9: DEFRA Risk of flooding from surface water (RoFSW) map data with climate change from <https://environment.data.gov.uk/explore/e5b38de2-99b3-44ee-b10c-b244926878ef?download=true>

7.3 Reservoirs, Canals And Other Artificial Sources

- 7.3.1 The failure of man-made infrastructure such as flood defences and other structures can result in unexpected flooding. Flooding from artificial sources such as reservoirs, canals and lakes can also occur suddenly and without warning, leading to high depths and velocities of flood water which pose a safety risk to people and property.
- 7.3.2 The 'Check the long term flood risk for an area in England' at <https://www.gov.uk/check-long-term-flood-risk> states that flooding from reservoirs is unlikely in this area.

8. CONCLUSIONS

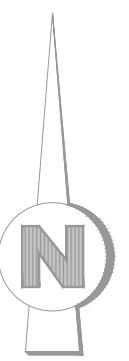
- The site is located within the NPPF Flood Zone 2.
- It has been established that the site is located outside of the design climate change 1 in 100 year flood extent and that the flood depth during the extreme 1 in 1000 year event would be 0.09m.
- It may not be practical to set the EV charging points and feeder pillar above the extreme flood level. Despite this, the substation will be set on a 100mm high plinth and above the extreme flood depth and prior to the onset of floodwater the remaining utilities will be shut down as part of the site flood management plan.
- The proposals do not require any employees to be permanently located at the site (only a small amount of visits for monitoring and maintenance purposes). In this regard, the number of people accessing the site will represent a very minor increase from the existing function of the land and those visits will be short and pre-planned.
- A warning and evacuation strategy has been developed within this assessment. It is proposed that the site management register with the Agency's *Flood Warnings Direct* and prepare a *Business Flood Plan*.
- It is considered that there is a low risk of groundwater flooding and a very low risk of flooding from surface water.

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DRAWINGS



C	21/02/25	BLB	Planning Boundary Amended
B	19/02/25	AJ	Disclaimer revised
A	10/02/24	BLB	Minor Amendments

Client: **British Land**

Project Location:
Reading Gate Retail Park
Reading
RG2 0QG

Drawing Title:

Existing Site Plan



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 : 44 90 8431 2451 support@PoGoCharger.com

PLANNING

Date: 13/02/25	Drawn By: BLB	Checked By: SPS	Size: A1
Scale: 1:200	Drawing Number: SI24-102-17-P-11		Rev: C





Date: 12/02/25	Drawn By: BLB	Checked By: SPS	Size: A1
Scale: 1:200	Drawing Number: SI24-102-17-C-22	Rev: B	

