



Botley West Solar Farm

Hydrology And Flood Risk Technical Note – Swinford HDD Crossings

Other Documents

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20 October 2025

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1 HYDROLOGY AND FLOOD RISK TECHNICAL NOTE – SWINFORD HDD CROSSINGS

1.1 Introduction

This technical note has been prepared to support discussions with the Environment Agency (EA) regarding the temporary Swinford Horizontal Directional Drill (HDD) location and associated flood risk. The Swinford Crossing HDD locations refer to HDD 6 Option A and B. This note aims to provide further details of the flood risk at the proposed HDD crossing locations at Swinford (HDD 6, either option A or B), justification of their location and intended mitigation.

HDD is proposed to be employed as a construction method for laying underground cables when it is not feasible to use the 'open cut' method to cross obstacles, including the River Thames at Swinford.

HDD is a trenchless method used to install underground cables along a predetermined arc-shaped path. For more information, see ES Chapter 6 – Project Description [\[APP-043\]](#). For the crossing location details, see 6.5 Environmental Statement Appendix 6.2 - Cable Laying Methodology and Indicative HDD Crossing Locations [\[REP4-016\]](#).

The process requires temporary compounds to be created at both the entrance and exit holes of the drilling sites. The dimensions of the entrance pits options at Swinford Crossing each comprise an area 30m x 75m and contain plant including the drill rig, equipment, storage tanks and settlement pits, power generator and the control office.

Comments Received from the EA

A comment was received from the EA relating to the DCO Application for Botley West; reference EAFR-009. This advised:

“Provide mapping that shows Flood Zones 3a and 3b with proposed components and the cable corridor route. Minimise interaction with Flood Zone 3b.”

Further correspondence with the EA provided the following additional information:

“The preferred approach is to avoid locating Horizontal Directional Drilling (HDD) entrance and exit pits within Flood Zone 3b, due to its designation as functional floodplain and the associated flood risk. We note potential entry / exit pits within Flood Zone 3b on Sheet 10 of 13 and Sheet 11 of 13 of Figure 13.9

Temporary facilities, cable corridor and Flood map plan.

A notable concern relates to the proposed HDD entrance pits near Swinford, on the north bank of the River Thames, which appear to potentially fall within Flood Zone 3b and an area that experienced significant flooding during the winter of 2013–2014.

If relocation of pits outside of Flood Zone 3b is not feasible, the applicant should provide a clear and robust justification for siting HDD infrastructure within a high flood risk area. In such cases, appropriate mitigation measures must be presented to manage and reduce flood risk. These measures may include, but are not limited to:

- Raising critical construction elements above anticipated flood levels;
- Ensuring the safety of site operatives during flood events;
- Providing safe access and egress to and from the HDD pits under flood conditions.

Given the location of the entrance pits within a high-risk flood area, there is also potential for flood flow routes through the HDD tunnel to the opposite bank of the Thames. The applicant should assess this risk and clearly outline the mitigation measures.

It is important to note that mitigation measures may remain relevant even if the HDD entrance and exit pits are located within Flood Zone 3a, as this is still an area at risk of flooding.”

1.2 Flood risk to the Swinford HDD crossing

The EA Flood Map for Planning is presented within **Figure 1** and demonstrates that the Swinford Crossing HDD entry compounds (HDD 6, Option A and B) are located within Flood Zone 3, and the HDD exit pit compounds are located within Flood Zone 2.

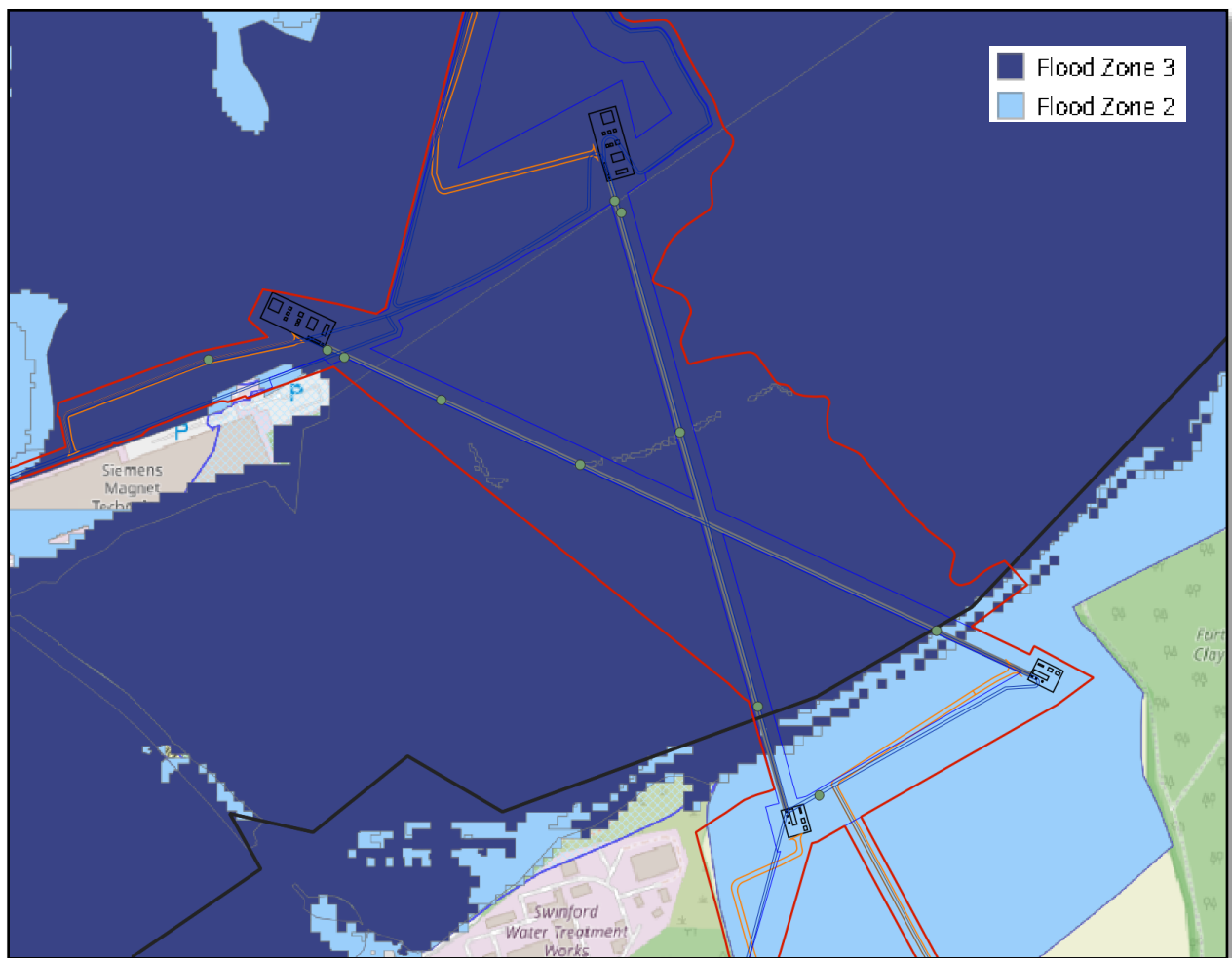


Figure 1. Environment Agency Flood Map for Planning

An extract from the Flood Risk from Rivers mapping within the West Oxon Strategic Flood Risk Assessment is presented below in **Figure 2**. This shows the entrance pits of the Swinford Crossing HDD are located within Flood Zone 3b, land with a greater than or equal to 3.3% chance of flooding in any given year (1 in 30-year return period). It is noted that the figure was created in 2016.

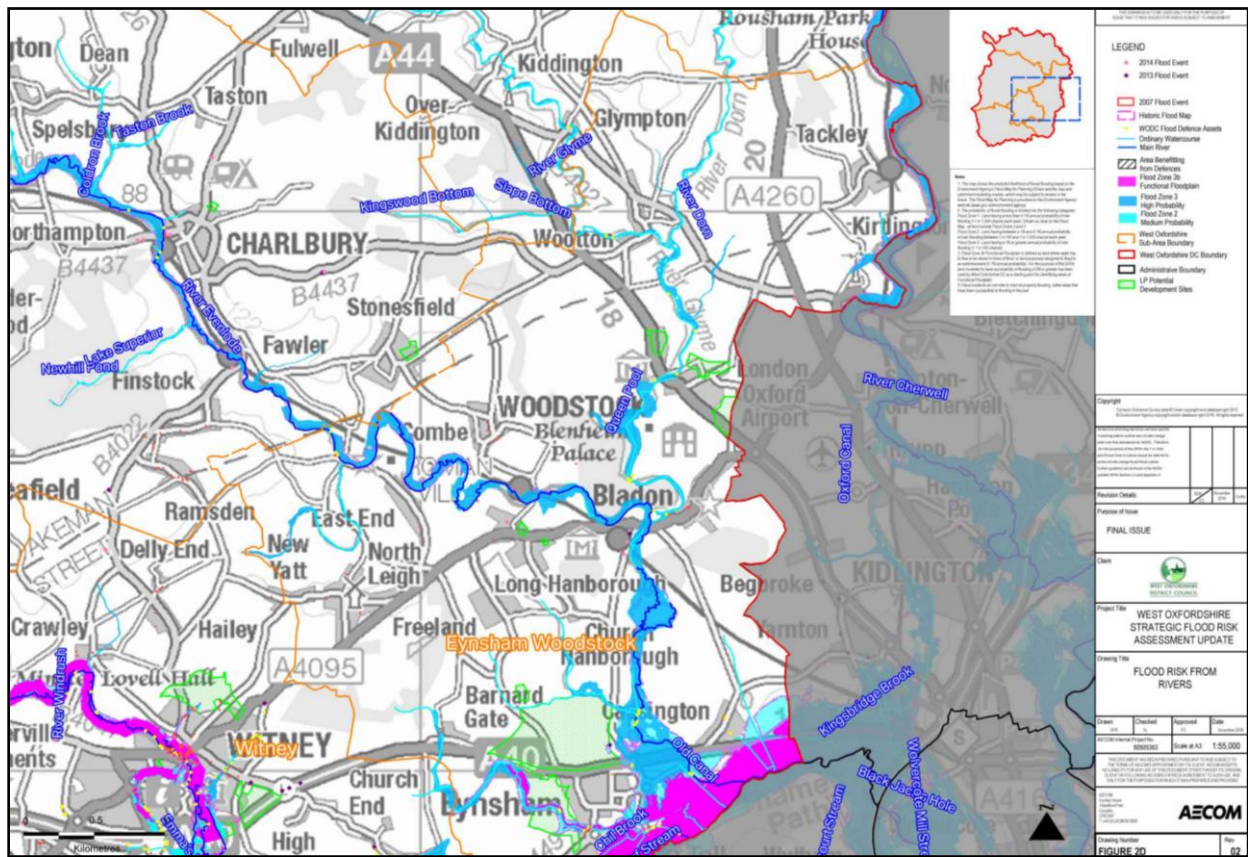


Figure 2. West Oxon SFRA Mapping

To confirm the location of the HDD entry pits within Flood Zone 3a and 3b, the Environment Agency Risk of Flooding from Rivers and Sea dataset has been used, as advised by the EA. The dataset displays the chance of flooding from rivers and sea, taking into account the presence and condition of flood defences and is updated by the Environment Agency every quarter. The risk of flooding is split into four classifications:

- High - greater than or equal to 3.3% chance in any given year (1 in 30)
- 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% chance in any given year (1 in 1,000) chance in any given year

The HDD compounds in relation to the Risk of Flooding from Rivers and Sea mapping are presented within **Figure 3** below. Both entry pits are located within the 'high' risk flood extent, equal to or greater than the 3.33% annual exceedance probability. Both exit pits are located outside the mapped extent of flood risk under a defended scenario.

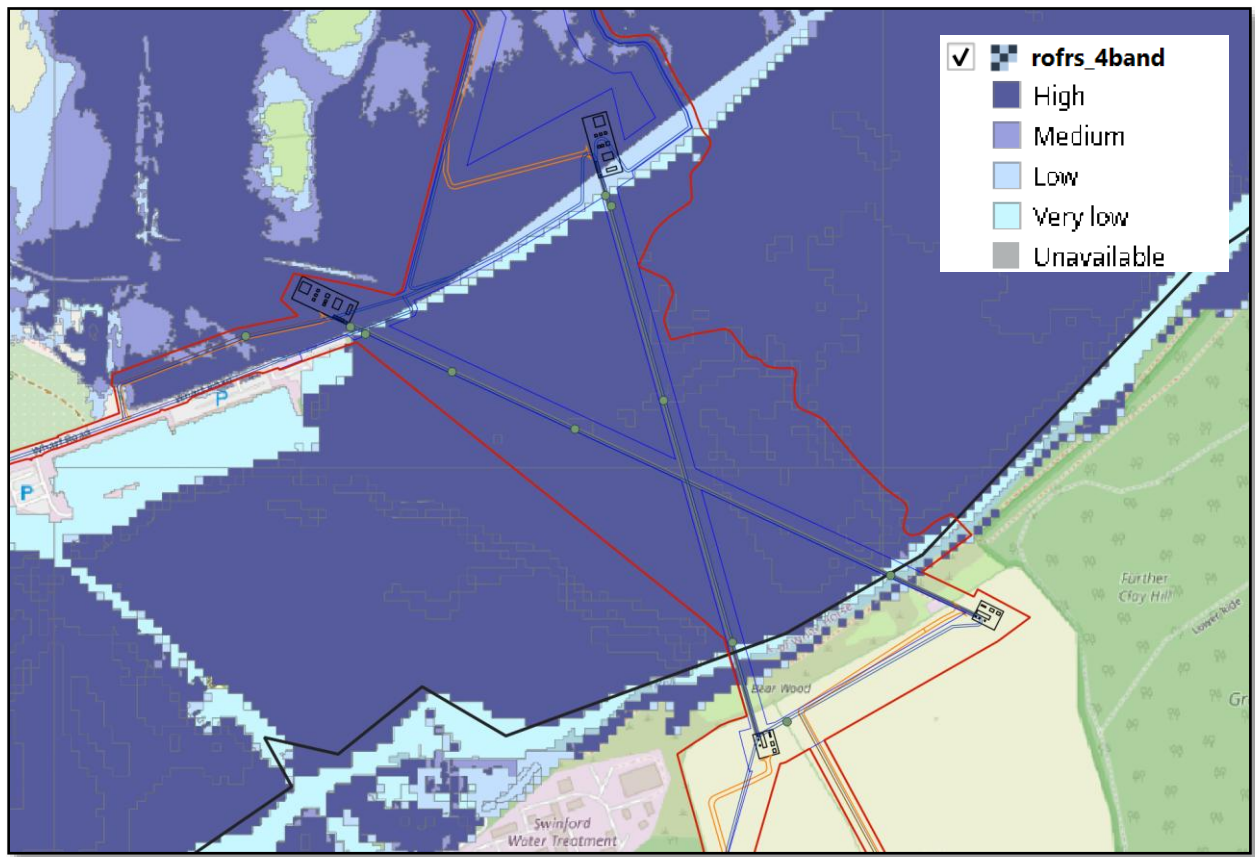


Figure 3. Risk of Flooding from Rivers and Sea in relation to Swinford Crossing HDD entry pit compounds

The entrance pits have a predominantly 'high' chance of flood depths up to 0.2m, a 'medium' chance of flood depths up to 0.3m and a 'low' chance of flooding being up to 0.6m in depth. Mapping notes a 'very low' chance for flood depths greater than 0.6m. As such, the maximum flood depths up to a 1 in 1,000 year (low chance) event are 0.6m. Flood depth mapping is presented within **Appendix A**.

The Environment Agency Recorded Flood Outlines Map additionally notes that the area has flooded several times in recent years, notably:

- Winter 2000
- January 2003
- Winter 2013 / 2014

As can be seen, flooding appears to seasonally occur during the winter months.

It is further noted that the Entrance Pits are located within the following Environment Agency Flood Warning Areas:

- 061FWF23Nwbrdg (River Thames between Newbridge and Kings Lock above Oxford) and
- 061FWF12Cassngtn (River Evenlode at Eynsham Mill down to and including Cassington Mill near Cassington)

1.3 Constraints

There is a requirement for the HDD entry pit (HDD 6) to be located at one of the two locations; Option A or B. This is owing to the requirement to cross the River Thames using HDD techniques at this location.

The location was selected due to a combination of environmental and engineering constraints. The works fall within a Flood Zone 3 area, where open-trenching would increase disturbance and flood risk. HDD is therefore required to minimise impacts on the floodplain, watercourses, and adjacent sensitive habitats. The size of the flood zone means there is no feasible location for the compound outside it within the project red line. Although open-trenching along the Swinford Bridge alignment was explored, this option proved technically impossible for the installation of two 275 kV circuits. Consequently, the HDD entry pit must be located at either Option A or B to achieve a viable and environmentally acceptable crossing.

Owing to the above constraints, the HDD entry pit (HDD 6) will have to be located at this particular site with mitigation measures proposed. The requirements of the mitigation are detailed below.

1.4 Mitigation measures to be implemented

To reduce the risk of flooding to the temporary HDD entrance pit compound, mitigation measures are proposed. These are intended to reduce the risk to the HDD compound, with further details provided in the Detailed Code of Construction Practice (CoCP) in collaboration with the EA. A commitment to provide these further details is provided in the Outline CoCP, Section 1.10 [\[REP5-041\]](#) and [\[REP1-042\]](#).

“At the HDD compounds, HVAC cable corridor and access tracks will be constructed within Flood Zones 2 and 3, construction measures will be adopted to maintain the existing level of flood protection during construction. These measures will be discussed with the EA. This will also include scheduling work windows during low river levels and briefing site personnel regarding weather conditions. If a Flood Warning/Flood Alert within the study area is issued works within the Flood Warning/Flood Alert areas would be stopped whilst the Flood Warning/Flood Alert active. A Flood Management Plan will be prepared prior to construction and will be set out in the CoCP.”

1.4.1 Construction Programme

As noted within the Outline Code of Construction Practice [\[REP5-041\]](#) and [\[REP1-042\]](#) the proposed working hours (between 7am and 7pm Monday - Saturday) and the assumed duration of the construction phase is 24 months from July 2026 to June 2028, with the Swinford HDD entry compounds proposed to be active for a duration of up to 6 months including preparation works and removal of compounds.

It is proposed to construct the HDD crossings at Swinford outside of the peak winter months, when there is a lower chance of a fluvial flood extent.

1.4.2 Raising critical infrastructure

Critical infrastructure within the Swinford HDD entry compound will be raised above the 0.6m flood level, with an appropriate 300mm freeboard. Further details will be provided in the Detailed CoCP.

1.4.3 Flood Risk Management Plan

There is a requirement to provide safe access and egress from the HDD pits under flood conditions to ensure safety for site operatives.

The provision for preparation of a Flood Risk Management Plan to be prepared as part of the Outline CoCP, has been included as commitment 10.10 within 6.3 - ES Chapter 10 - Hydrology and Flood Risk [\[REP5-041\]](#) and [\[REP1-042\]](#) as embedded mitigation. This will include details of safe access, egress and avoidance of works during a flood warning event.

The inclusion of this and the details during the Detailed CoCP preparation will include consultation with the Environment Agency. This approach was agreed upon in a meeting with the Environment Agency on the 14/07/2025.

1.4.4 Additional Mitigation

As flood depths impacting both HDD entry pits are assessed up to 0.6m, additional flood resistance measures are proposed to reduce the risk of flooding to the HDD entry pit compounds during the construction phase. There is a potential risk of flood flow routes through the HDD tunnel to the opposite bank of the Thames.

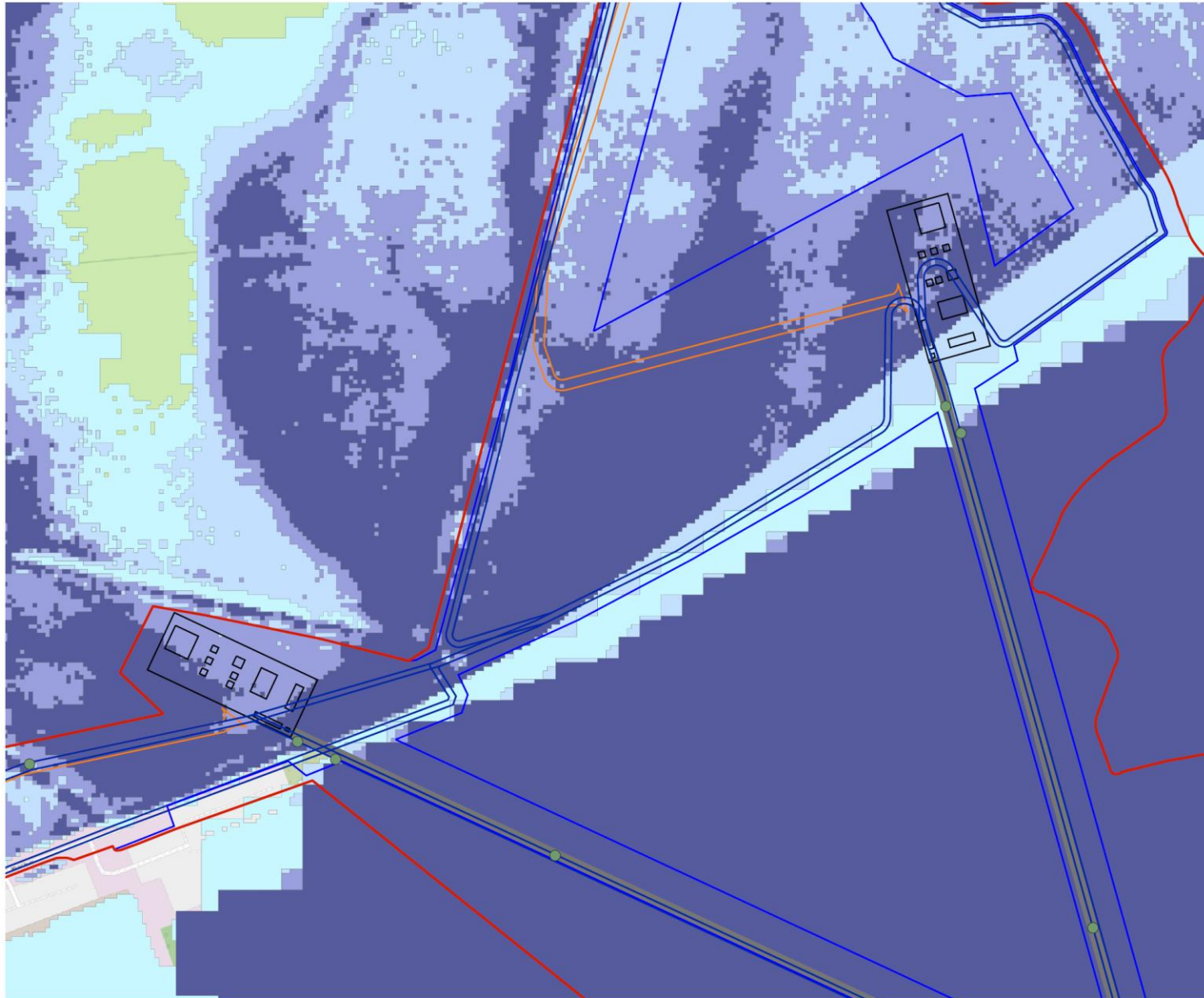
These mitigation measures could include, but are not limited to the following:

- Installing temporary flood barriers or cofferdams during construction to protect points of entry/exit points from water inundation.
- Implementing robust tunnel lining and sealing techniques to ensure structural integrity and prevent leakage.
- Monitoring groundwater and flood levels continuously during construction.
- Developing an emergency response plan to address any unintended flood flow through the tunnel.

1.5 Conclusion

In summary, although the Swinford HDD entrance pits are located within a high flood risk area, their placement is necessary due to project and environmental constraints. Comprehensive mitigation measures are proposed and secured via the Outline Code of Construction Practice. These measures include raised critical infrastructure, construction timing, and a Flood Risk Management Plan. These will be developed with the Environment Agency to effectively manage and minimise flood risks, ensuring safe construction.

APPENDIX A – RISK OF FLOODING FROM RIVERS AND SEA FLOOD DEPTHS



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Risk of Flooding from Rivers and Sea
0.2m depth

■ High
■ Medium
■ Low
■ Very low
■ Unavailable

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Risk of Flooding from Rivers and Sea - 0.2m flood depths

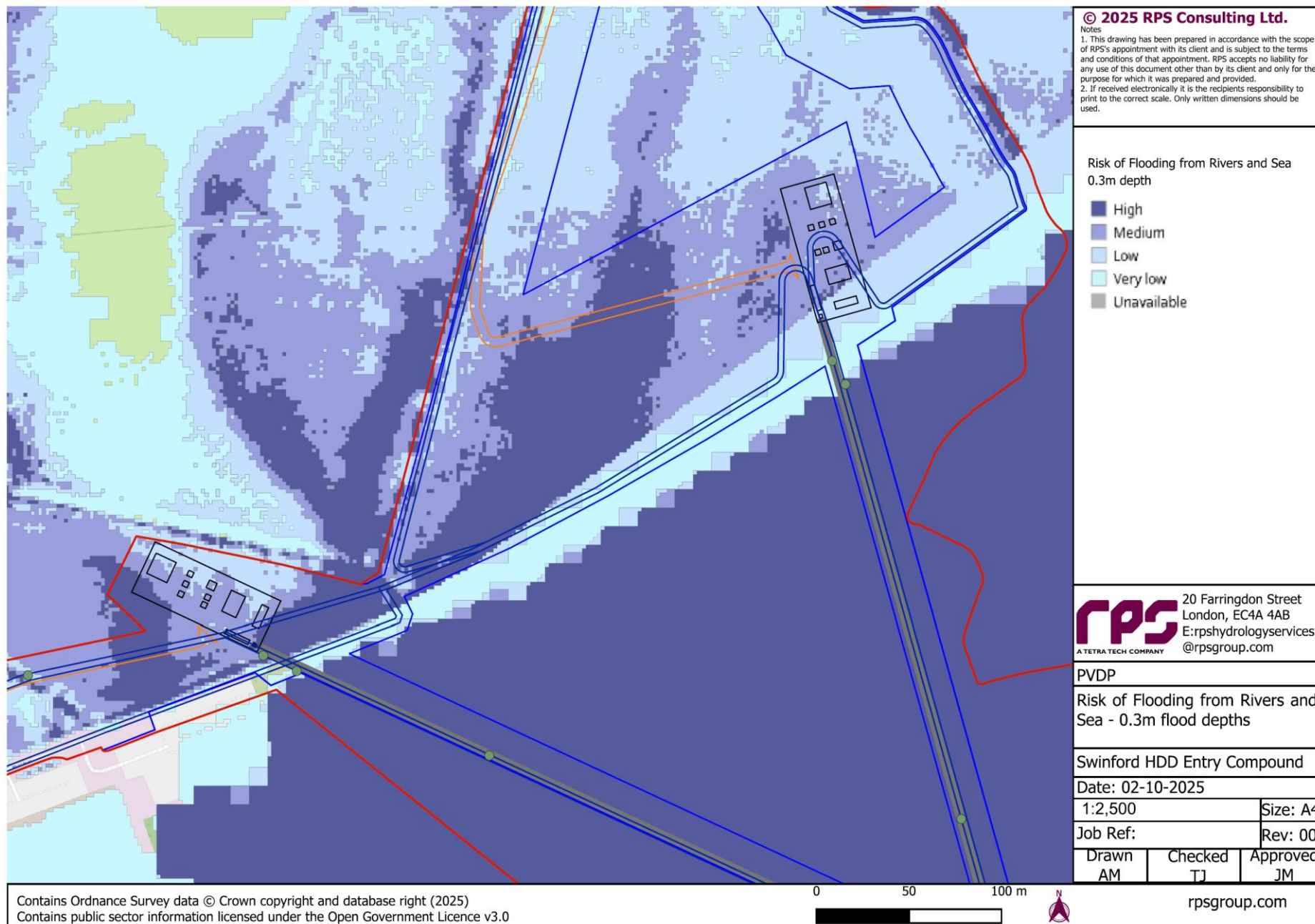
Swinford HDD Entry Compound

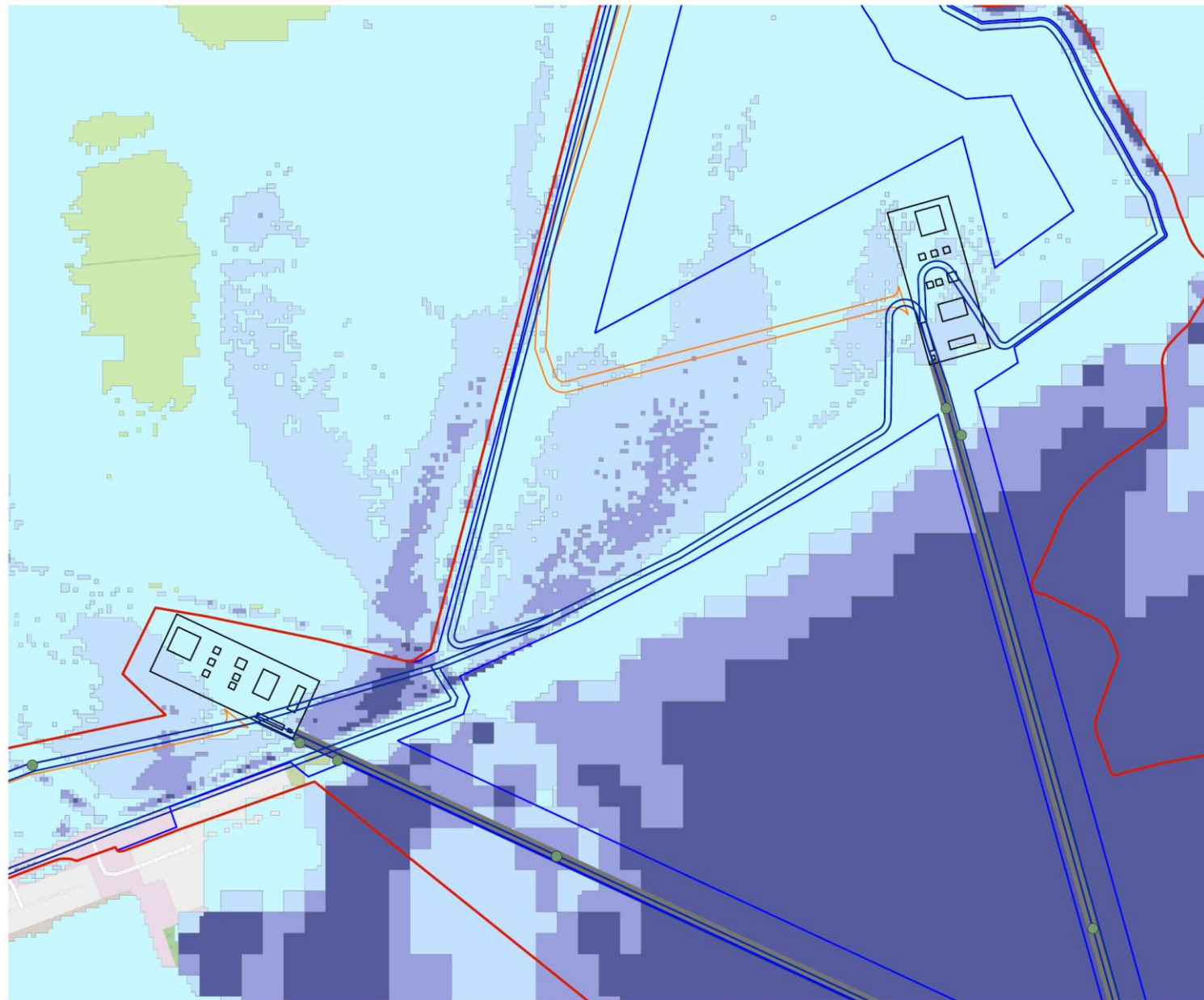
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**Risk of Flooding from Rivers and Sea
0.6m depth**

- High
- Medium
- Low
- Very low
- Unavailable

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Risk of Flooding from Rivers and
Sea - 0.6m flood depths

Swinford HDD Entry Compound

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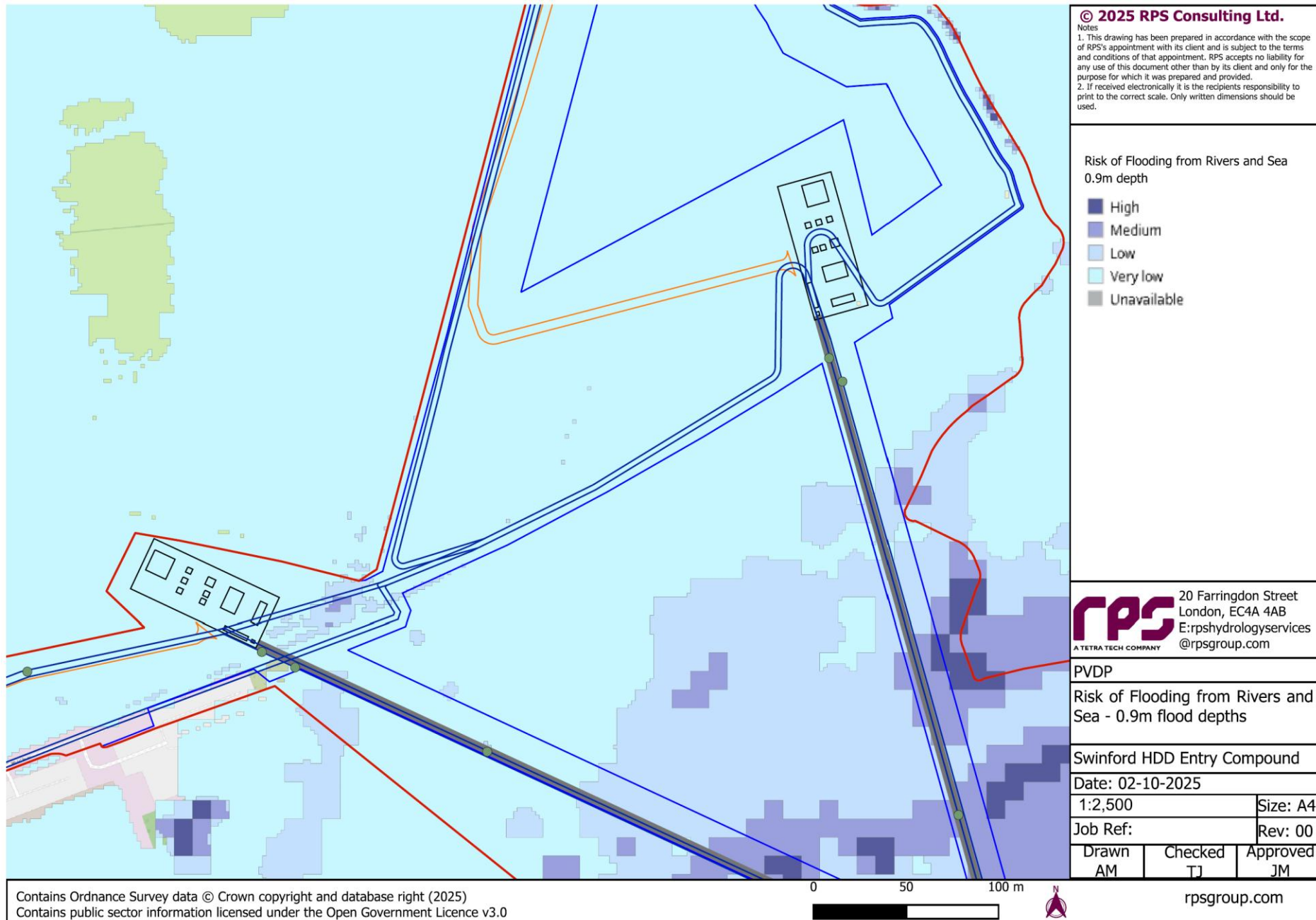
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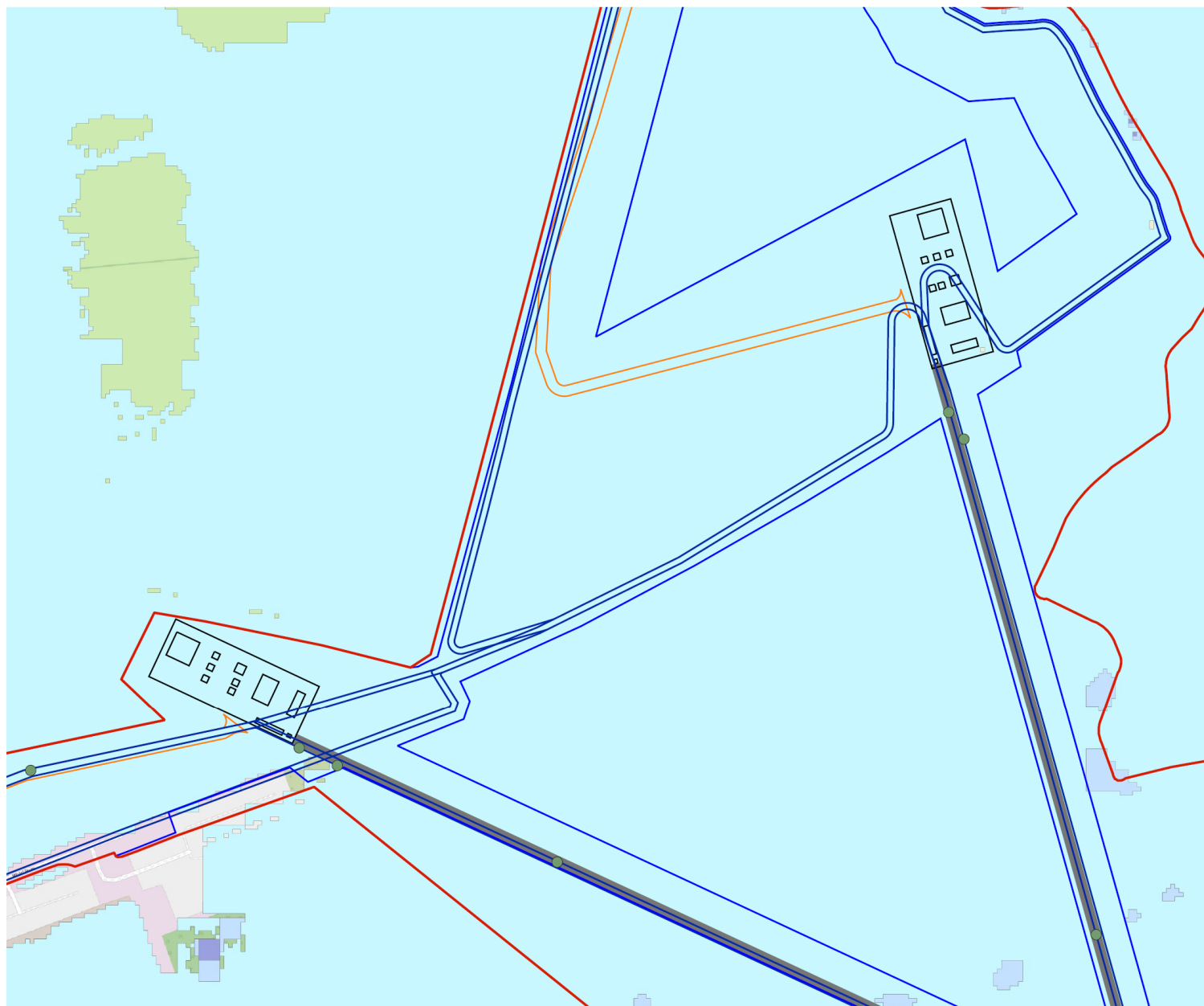
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**Risk of Flooding from Rivers and Sea
1.2m depth**

- High
- Medium
- Low
- Very low
- Unavailable

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Risk of Flooding from Rivers and
Sea - 1.2m flood depths

Swinford HDD Entry Compound

Date: 02-10-2025

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