

The Hop Pocket, Bishops Frome

The Hop Pocket

Technical Note May 2023





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Appendix A - Topographical Survey



1 Introduction

- 1.1 Rappor provide expert Transport Planning, Highways, Infrastructure and Flood Risk consultancy services throughout the UK.
- 1.2 Rappor were appointed by The Hop Pocket to provide flood risk consultancy in support of a planning application for the proposed installation of ground mounted solar PV panels on two separate fields at The Hop Pocket shopping village.



2 Existing Site Conditions

- 2.1 The Hop Pocket shopping village is located off the B4214 approximately 500m south of Bishops Frome. The approximate co-ordinates for the shopping village are E: 366302; N: 247218, with the nearest post code of WR6 5BT.
- 2.2 The current site comprises of two parcels of land, herein referred to as 'Site A' and 'Site B', as shown by Figure **2.1**. Both parcels of land are currently arable greenfield land. Site A is surrounded by greenfield land in all directions, and Site B has greenfield land located to the north and east. Two dwellings are located to the west of Site B, and a car park to the south.



(Source: Promap)

Topography

2.4 A detailed topographic survey was carried out, a copy of which is included within Appendix A. Ground levels on Site A fall slightly in an westerly direction, from approximately 73.91 metres Above Ordnance Datum (mAOD) to approximately 72.93mAOD located in the west of the site. Ground levels on Site B fall slightly in a south-westerly direction from 74.43 mAOD to 73.24mAOD located in the west of the site.

Geology

2.5 Geological data held by the British Geological Survey (BGS)¹ shows that the bedrock geology underlying Site A and Site B is Raglan Mudstone Formation (siltstone and

2.3

Figure 2.1 Site Location

¹ https://geologyviewer.bgs.ac.uk/



mudstone interbedded). Superficial deposits are recorded as alluvium (clay, silt, sand, and gravel) in most of Site A and Site B. No other superficial deposits are recorded.

2.6 Soilscapes mapping² indicates that the underlying soil in Site A and Site B is slightly acidic, loamy and clayey soils with impeded drainage.

Existing Drainage

- 2.7 The River Frome (main river) is located approximately 150m west of Site A and 130m west of Site B. Filly Brook (ordinary watercourse) is located approximately 300m west of Site B, and an unnamed ordinary watercourse is located approximately 20m north of Site A this is a tributary to the River Frome.
- 2.8 Both Site A and Site B are believed to currently drain informally via natural infiltration.

Flood Risk Vulnerability

- 2.9 The Environment Agency Flood Zones are the current best information on the extent of the extremes of flooding from rivers or the sea that would occur without the presence of flood defences, since these can be breached, overtopped and may not be in existence for the lifetime of a development.
- 2.10 Table 1 of NPPF, categorises flood zones into:
 - a) Zone 1- Low risk, less than 0.1% Annual Event Probability (AEP) (< 1 in 1000 years)
 - b) Zone 2- Medium risk, 0.1% AEP (1 in 1000 1 in 100 years)
 - c) Zone 3a- High risk, 1% AEP (> 1 in 100 years)
 - d) Zone 3b- High risk Functional Floodplain, 3.33% AEP (>1 in 30 years)
- 2.11 Site A and Site B are located partially within Flood Zones 2 and 3 as shown on the Environment Agency Flood Map for Planning³ and **Figure 2.2**. This is the area shown to be at high to medium risk of river flooding associated with the River Frome.

² http://www.landis.org.uk/soilscapes/

³ https://flood-map-for-planning.service.gov.uk/





Figure 2.2 Environment Agency Flood Map for Planning

- 2.12 The proposed development is considered to be 'essential infrastructure' in terms of its land use type flood risk vulnerability as shown in Annex 3 of the PPG⁴.
- 2.13 The NPPF sets out a matrix indicating the flood risk vulnerability types of development that are acceptable in different flood zones based upon the Flood Map for Planning as shown in Table 2 of the PPG.
- 2.14 The development proposals are classed as 'essential infrastructure' within Flood Zone 3 and therefore an exception test is required.

⁴ https://www.gov.uk/guidance/flood-risk-and-coastal-change#flood-zone-and-flood-risk-tables





3 Fluvial Flooding

Historic Flooding

- 3.1 The Herefordshire Council SFRA (2019)⁵ states that the most significant fluvial flood risk to Bishop's Frome and surrounding areas is the River Frome, with one flood event in Bishop's Frome occurring in 2012. This did not affect the site.
- 3.2 EA recorded flood outlines indicate that while flooding has occurred within the vicinity of both sites, this did not affect either site (**Figure 3.1**). The flood indicated to have occurred closest to the sites was caused by the River Frome exceeding its channel capacity in 1947.



(Source: Environment Agency)

Figure 3.1 Environment Agency Recorded Flood Outlines

Fluvial Flood Risk

- 3.3 Flooding from watercourses occurs when flows exceed the capacity of the channel, or where a restrictive structure is encountered, which leads to water overtopping the banks into the floodplain. This process can be exacerbated when debris is mobilised by high flows and accumulates at structures.
- 3.4 Both Site A and Site B are located partially within Flood Zones 2 and 3 as shown on Figure2.2. This is the area shown to be at high to medium risk of river flooding associated with the River Frome.

⁵ https://www.herefordshire.gov.uk/downloads/file/18104/strategic-flood-risk-assessment-april-2019



- 3.5 Following consultation, the Environment Agency and Herefordshire Council confirmed they do not hold any flood data applicable to the River Frome. Approximate flood levels have therefore been interpolated by identifying the highest ground levels that the flood zones extend to.
- 3.6 Flood Zone 3 is shown to reach a design flood level of 73.46mAOD in relation to the study area. The lowest ground level along the western boundary of Site B is circa 72.87mAOD. The maximum possible depth of high-risk flooding is approximately 0.59m on this plot.
- 3.7 The lowest ground level in the west of Site A is approximately 72.93mAOD. The maximum depth in the design flood event at Site A is therefore circa 0.53m.
- 3.8 Flood Zone 2 extends to a height of 73.59mAOD. Flood levels at Site A in the 0.1% AEP flood could therefore reach a maximum depth of 0.66m. On Site B, flood levels could reach depths of 0.72m.
- 3.9 Local Environment Agency guidance does not indicate a predefined increase in flood level that could be included on top of the design flood levels for the proposed development to account for the potential effects of climate change, this being categorised as 'essential infrastructure'. On this basis it is considered reasonable to consider the flood levels applicable to the extent of the floodplain for the purposes of design considerations, based upon the Flood Zones and the extent of Flood Zone 2.
- 3.10 Fluvial flood risk for the proposed development is therefore considered to be medium to high.



4 Mitigating Fluvial Flood Risk

Solar Farm Operations and Safety

- 4.1 The areas located within flood extents will be allowed to flood, with all panels in these areas resilient to minor flooding and immersion. The solar panels will be supported on frames above ground level. Free passage of overland flows will be maintained.
- 4.2 The manner of assessment undertaken has identified the proposed solar panels may be subject to flooding with depths potentially over half a metre. Typically, solar PVs are raised at least 1m above ground level on stilts to maximise sunlight up to a height just under 3m.
- 4.3 As the solar panels themselves are raised, these will likely not be affected by high risk flood events based on the depths of potential flooding identified. Ancillary equipment such as Medium Voltage Power Station Cabinets should be flood resistant, watertight or located outside the floodplain in both sites.
- 4.4 The proposed development is not considered to be an 'occupied' development, meaning that there is negligible risk to users.

Safe Access and Egress

- 4.5 Safe access/egress is available from Site A to land outside the floodplain to the east of the site and from Site B to the car park located to the south of the site. From here, however, there is not safe access to the B4214.
- 4.6 It is advised that the operator should register for the Environment Agency free Flood Warning service this is confirmed to be available for this location. This would allow time to ensure that maintenance visits or access for other reasons is postponed until it is safe and possible to access.



5 Summary and Conclusions

Summary

5.1 This Technical Note has considered the fluvial flood risk to the site and indicated the flood depths that maybe experienced by the proposed development.

Conclusions

- 5.2 Both sites A and B are located partially within Flood Zones 2 and 3 on the Environment Agency Flood Map for Planning. This is the area shown to be at medium to high risk of fluvial flooding.
- 5.3 High to medium risk flood event depths are identified to be in excess of 0.5m on both plots.
- 5.4 Due to the nature of solar arrays and the support structure involved, the free passage of flood flows beneath the solar arrays could be maintained and the panels themselves elevated above high risk flood flows.
- 5.5 The operator should register for the Environment Agency free Flood Warning service, allowing for time to ensure that maintenance visits or access for other reasons is postponed until it is safe and possible to access.
- 5.6 Ancillary equipment and any other sensitive control equipment and all electrical cables and connections within the areas at risk of fluvial flooding must be protected.



Appendix A – Topographical Survey





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