

Application number: P/23/068/ROV

Application type: Variation/Removal of Condition

Flood Risk Assessment

1.0 Potential sources of flooding

There are two potential sources of flooding to be considered with regards to the application.

- Pluvial flooding – from rainwater/surface water flooding
- Tidal flooding - arising from overtopping of dunes

There are no waterbodies or watercourses which might cause flooding at this location – therefore neither fluvial nor artificial sources of flooding are of concern.

Southwest Water manage the drinking water and sewerage infrastructure on the island – there is no infrastructure east beyond Higher Town and therefore no sources of potential sewerage flooding in this location.

2.0 The Yurt Structure

The yurt is constructed of wooden lattice walls with canvas covering.



Photo 1 – showing the structure of the yurt.

The base is a tanalised wooden timber framework with a tanalised wooden gravel board floor. It is slightly elevated from the ground.

The structure itself can be put up or taken down within 3-4 hours, allowing it to be moved and stored temporarily if need arises. All elements of the structure can tolerate temporary water immersion in the event of a flood as they comprise tanalised/treated wood and water-resistant canvas. This means that the structure has both resistance to damage from short-term immersion, but can also be easily removed from the location in the event of a flood risk.

There is no electrical or plumbing infrastructure associated with the yurt – there is therefore no risk of electrical damage or concern over foul water leakage etc. associated with the installation in the event of a flood.



Photo 2 – showing the base of the yurt during construction. The elevation above the surrounding land can be seen.

3.0 Pluvial Flooding – Overview

The yurt location lies downslope from the vineyard which occupies the hillside to the north. For this reason, excess rainfall could potentially lead to surface water flooding within the general area of the yurt installation.

Over the three years that we have resided full-time in the yurt and here on the vineyard, there has been no surface water flooding in this location. Pool Green to the east has flooded extensively, sometimes as far as the perimeter track, as have other areas of pasture land in the vicinity. The main source of surface water runoff is the hillside to the north – this is now managed here on the vineyard in a manner akin to an orchard, with permanent pasture with vines. Further upslope are areas of elm woodland, bracken and bramble. We operate a no-till, no-spray management of the vineyard which results in almost 100% vegetation cover, year-round. This has resulted in excellent water retention, noticeably higher than other locations around the island where land use involves more bare soil with arable or bulb growing operations.

In the event that rainfall was sufficient to overcome the natural resilience of the land, the location of the yurt would mean that adjacent land would flood long before the yurt location was affected. The photograph illustrates the situation of the yurt – the track to the north lies around 50cm lower than the yurt base and, being closer to the potential source of rainwater flooding, would serve as an early warning system if rainwater flooding were to pose a risk to the yurt.



Photo 3 – showing the position of the yurt with the lower-lying track to the north – this is the potential source of rainwater flooding from the vineyard slopes.

3.1 Pluvial Flooding - Risk to Property (yurt and contents)

The structure of the yurt means it would be easy to remove and store in a safe location at short notice if there were an impending risk of flooding. As noted above, there would be an early-warning system in the form of the land to the north which would allow ample opportunity to remove the yurt.

The yurt base would easily be able to withstand a period of immersion underwater if this occurred – however also note the elevation of the base above the ground level which provides a further element of protection from surface water flooding.

The contents of the yurt itself are minimal, due to its small size, and could easily be moved to a safe location in the case of a flood risk

With no electrics or plumbing, there would be no further residual risk of electrocution of foul water leakage.

3.2 Pluvial Flooding - Risk to persons

As identified above, the pace at which any flood risk occurred would allow ample time to move the yurt to a place of safety.

The incremental rise in water levels which might occur, coupled with the low level which it is likely to achieve even in a worst case scenario, would result in no risk to occupants from rain water/surface water.

4.0 Tidal Flooding – Overview

The location of the yurt is situated just over 5m AOD which was at a height which allowed for it to be considered out of flood risk at the time of original application.

There has been subsequent modelling of flood risk which changes this assessment – reliance on height AOD does not take account of the specific risk factors in this location. We acknowledge that the lack of an FRA associated with the original application should be addressed in light of the new modelling.

The specific risk associated with our location arises from the land form which creates a bowl between the dunes to the south and the hillside to the north. The situation in which the land could flood would require the 9-12m OAD dunes of Par Beach to be breached, and for sustained over-topping of waves which would result in the ‘bowl’ filling with water which could not then escape in the same manner.

A breach of the dunes has not occurred in at least 60 years - there is anecdotal evidence of the sea overtopping the dunes at Pool Green in the early 1960s after which soft sea defences were installed. These were Marram grass & Tamarisk. Since then it has regenerated after each severe storm.

The risk of serious storm events occurring are obviously increased by climate change and this is reflected in the models. This is relevant with regards to two significant risk factors which are exacerbated by climate change – increased sea level and increased storm frequency and severity.

For the purposes of the current FRA, the current baseline models are used rather than the 30y CC models. This is for the following reasons:

- 1) The elevated sea levels predicted over the next 30 years will not significantly change in the next 3 years – the current (rather than CC) model is therefore a more accurate reflection of the conditions within the lifespan of the requested VoC;
- 2) The current models account for variation in storm severity and frequency – hence the different 1:200 and 1:1000 year predictions. The current increase in storm severity from existing climate change is modest compared with the predictions for a further 30 years in the future. The most extreme 1:1000 year model based on current conditions is therefore used in this FRA. Whilst the risk due to existing increases in storm severity may make the 1:1000 event more likely, it is also relevant that the proposal under consideration is limited to just 3 years. The likelihood of an event occurring is a function of its probability and the length of time it is exposed to that probability.

The models clearly show that there is a risk of a 1/200 and 1/1000 year storm event causing flooding from coastal sources in the proposed yurt location. However this would require a combination of conditions including adverse swell and wave height; high tide (likely spring); and a severe storm. In the situation where this did occur, the overtopping would have to continue for a sustained period before it caused a risk of flooding to the yurt location – for example, the land at Pool Green is 4m AOD which means this, and all lower lying land, would likely need to flood and fill before the water began to rise

significantly at the yurt location. This sequence of flooding and concomitant forewarning has been confirmed by Mark Williams (Planning Advisor at the EA) in relation to a similar location on the vineyard with regards to planning permission P/22/048/FUL.

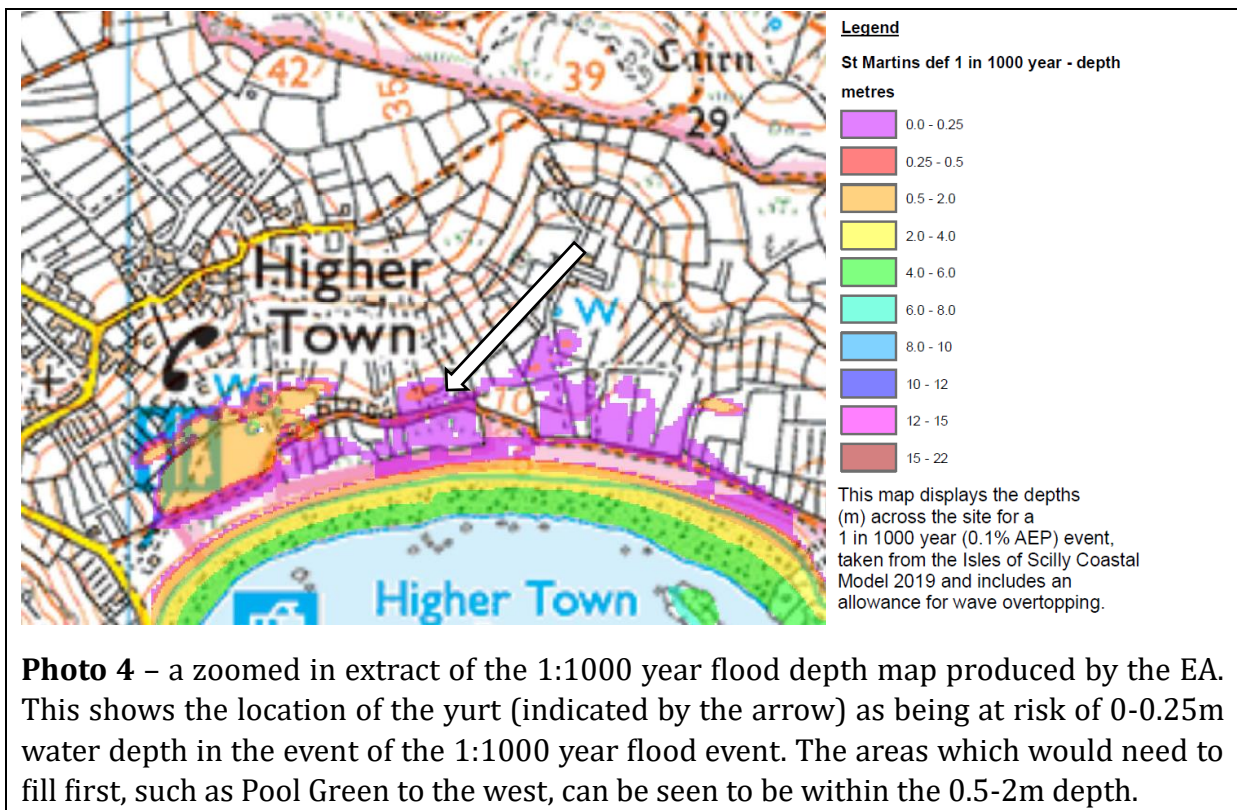


Photo 4 – a zoomed in extract of the 1:1000 year flood depth map produced by the EA. This shows the location of the yurt (indicated by the arrow) as being at risk of 0-0.25m water depth in the event of the 1:1000 year flood event. The areas which would need to fill first, such as Pool Green to the west, can be seen to be within the 0.5-2m depth.

4.1 Tidal Flooding – Risk to Property

As outlined above with regards rainwater/surface water runoff, the nature of the yurt means that the structure and all of the contents could be quickly removed to a safe, dry location in the event of a potential impending flood. The base itself could withstand a period of immersion, and could be quickly and easily replaced even if a more sustained immersion occurred.

The circumstances in which the location could potentially flood from coastal sources would be foreseeable – it would require a specific set of circumstances to occur with a storm severity which would not be overlooked by a coastal community. If there was a risk of flooding occurring from sustained coastal overtopping, there would be ample warning to allow the above protective measures to be put in place well before a storm hit. There is a further safeguard in that the sequence of flooding, dictated by the land form, would offer a further buffer following initial over-topping before there would be risk of flooding at the yurt location. This is the forewarning which the EA Planning Advisor identified for the vineyard location.

The flood map shows that the risk from a 1:1000 event occurring would still result in only a 0-0.25 depth of flood in this location. The yurt is elevated on its base (see Photo 3) which would mean that even in this storm event, it is likely that it would stay dry.

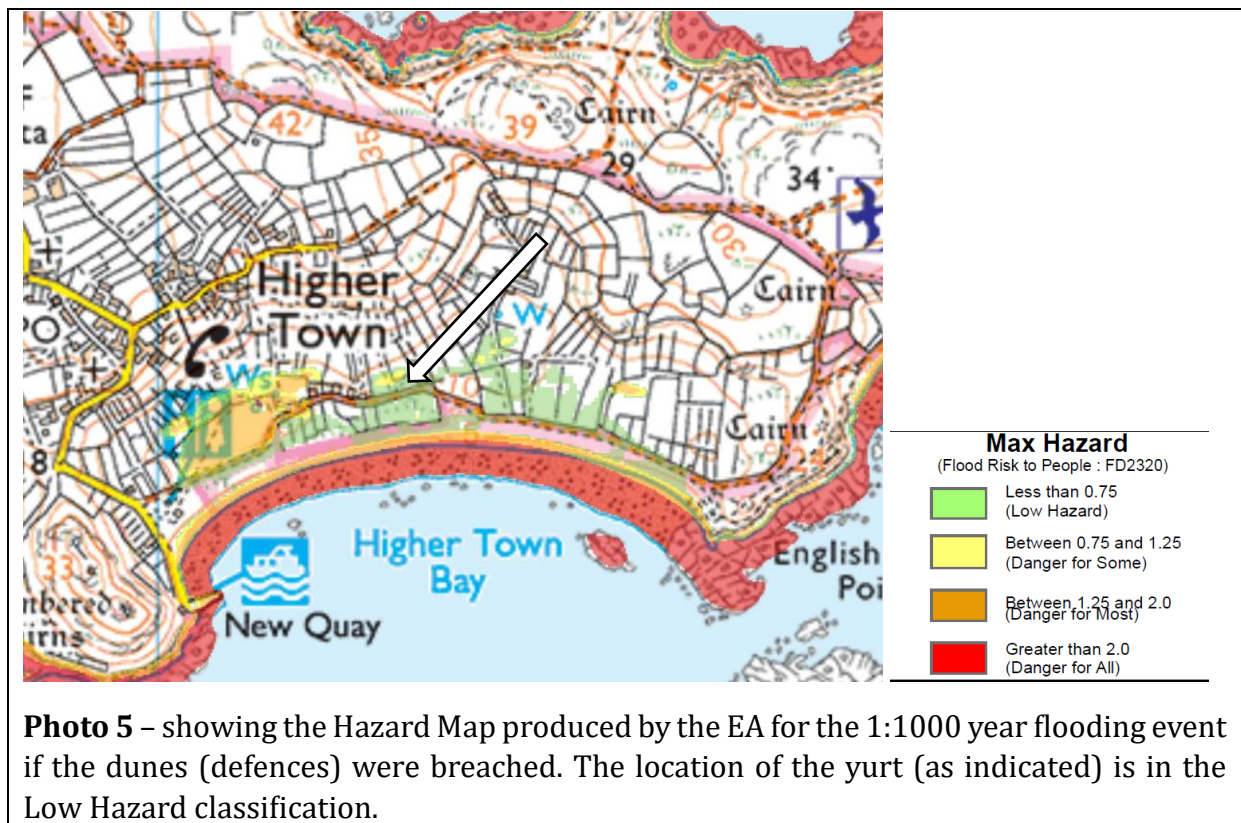
For this reason, it is not considered that the coastal flooding source represents a risk to the structure or property as there would be ample warning for comprehensive measures to be put in place to remove the structure to a dry, safe location.

4.2 Tidal Flooding – Risk to Persons

The hazard map produced by the EA places the yurt location in the Low Hazard zone, largely related to the low level of water which is predicted to flood even in the event of the dunes breaching.

The reasons outlined for why the structure could be protected apply equally to the risk to persons. This involves:

- Ample forewarning of a potential event which would result in overtopping of the dunes to ensure evacuation – again, despite many significant storms, a breach of the Par Beach dunes has not occurred in at least 60 years – the coincidence of the necessary variables coupled with a sufficiently severe storm would not be overlooked by the community;
- A significant safety buffer in terms of time from initial overtopping before flooding would result in a risk to the yurt location to allow evacuation even in the inconceivable event that it was not foreseen;
- The worst-case 1:1000 year flood risk model still only predicts <0.25m flooding which would not result in a risk to life.



In addition, the yurt is not a structure which would trap occupants inside in the case of unforeseen flooding. This is for the following reasons:

- The yurt has a two-part stable door – in the event that flooding could impact on the ability to open the lower half due to water pressure, the upper half could be opened independently to allow evacuation;
- The canvas can easily be cut to allow evacuation in the most extreme instance.

There is a clear evacuation route off the vineyard which would allow the occupants to reach a place of safety even in the most extreme scenario – this is shown on the map below.



Photo 6 – showing the yurt and the evacuation route (blue) which is all upslope to a point beyond the flood risk zone. The vineyard land holding is illustrated in red.

Finally, the yurt would only be occupied by us, the applicants and authors of this statement. There is therefore no risk of somebody residing in the yurt who is not aware of the risk or the necessary precautions which would need to be taken if the potential for coastal overtopping and flooding occurred.

5. Summary

This summary provides a detailed site-specific assessment of the potential sources of flooding; the risk to property and people, and the various site specific considerations which affect this. Measures which might ordinarily be built into a development to mitigate risk of flooding, such as elevated finished floor levels; ground levels to encourage water away from the structure (see Photo 3); and ensuring safe access/egress/evacuation are all built into the existing structure.

It is identified that, within the 3-year lifespan of the yurt which is requested in this Variation of Condition, the flood risk would be low, likely minor (<0.25m in the worst case scenario) and any residual risk easily mitigated. This is due to:

- 1) The degree of forewarning associated with the specific mechanism by which coastal flooding could occur – this would allow measures to be put in place to move the yurt structure, contents and residents to a safe location;
- 2) The low risk even in the worst case scenario of a 1:1000 flood risk event where the EA modelling predicts a depth of water of 0-0.25m at this location, and the Hazard Map which identifies a low risk to persons;
- 3) The nature of the yurt structure which would allow for easy removal prior to a flood risk event; and would not risk trapping people inside.

It is also noted that this application is a Variation of Condition to allow an existing structure (which has been onsite since March 2020) to remain in place for a further 3 years. It is not for the construction of a new building in this location.

The purpose of the extension is to allow us to apply for a revised planning permission to construct the permanent staff dwelling in a safe location. We take the flood risk modelling very seriously, especially the implication of climate change and sea level rise which are already baked into the future by existing emissions, and the new modelling is the reason why we have not proceeded with the consented staff dwelling. This this request for an extension is specifically in order to allow us to build in a location which will be safe from future flood risk.