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Mr. and Mrs. M Heaslip,
The Meadows Caravan and Camping Site,
Pentewan Road
Nansladron,
St. Austell
Cornwall
PL26 6DL

26th September 2018

Dear Mr. and Mrs. Heaslip,

**Flood Risk Assessment:
Accommodation Pods, The Meadows, Pentewan, St Austell**

1. Introduction

The Proposed Development, which is on an existing campsite, involves the construction of 10 accommodation pods, each on raised deck and measuring 7m by 7m with verandah, providing self-contained living, cooking and sleeping space.

2. Sequential Test

Please see Table 2 of “Planning Practice Guidance for Flood Risk and Coastal Change”, DCLG, updated 6th March 2014 (referred to herein as PPG).

The Flood Risk Vulnerability Classification for the existing land use (caravan and camping site) is defined as “More Vulnerable”.

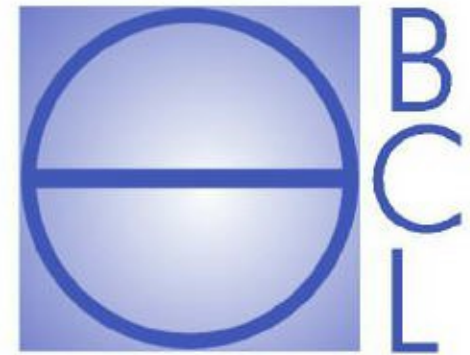
The majority of the caravan and camping site lies within Flood Risk Zone 3 (FRZ3), which is the highest risk setting (except for the functional floodplain).

A change of use to a “more vulnerable” development would not be acceptable in the FRZ3 setting (Table 3 of PPG). However, the caravan and camping site is already permitted under Planning Permission C2/98/01452.

Therefore, in applying the Sequential Test, a pragmatic approach on the availability of alternatives should be taken. As per current guidance, when considering planning applications at existing business premises, it would generally be impractical to suggest that there are more suitable alternative locations for that development elsewhere.

For this reason, it is considered that the development proposal cannot be steered into a lower risk setting (FRZ1 or FRZ2).

The only part of the landholding that lies outside FRZ3 is at the northern end, which is already occupied by the campsite reception and owner’s bungalow.



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3. Exception Test

This asks for demonstration that (i) the development will provide wider sustainability benefits to the community that outweigh flood risk, and that (ii) it will be safe for its lifetime, without increasing flood risk elsewhere and where possible reducing flood risk overall.

(i) Sustainability

As stated in pre-application advice (PA17/03005/PREAPP, dated 24th November 2017):

- This proposal is at an established tourism site; the principle of such proposals which allow existing rural businesses to develop and expand is supported by both national and local planning policy.
- The Cornwall Local Plan (CLP) sets out that the vision for Cornwall's future is to “achieve a leading position in sustainable living”. “One of the objectives identified in relation to supporting the economy is that of enhancing “the cultural and tourist offer in Cornwall and to continue to promote Cornwall as a year round destination for tourism and recreation”.

(ii) Safety in event of flooding

This planning application represents an opportunity to improve the flood resilience of the caravan and camping site *e.g.* by ensuring that Finished Floor Level (FFL) in the accommodation pods is 300 mm above the estimated flood level (see Section 5).

Proposals for surface water management (Section 9) will ensure that there is no increase in flood risk at downstream receptors.

4. Hydrological Setting

The Site is located in the open countryside to the west of the B2373, which runs through the Pentewan Valley, with the village of Pentewan 1 km to the south and St Austell 4 km to the north.

A topographic survey of the Site was completed by Prime Surveys on 26th March 2018. Please refer to Drawing PS1858-1. The area allocated for the accommodation pods is at the southern end of the campsite, centred upon National Grid Reference (NGR) ²00775 ⁰47915.

Ground level at the footprint of the accommodation pods is 5.70-6.15 metres above Ordnance Datum (maOD).

The Pentewan Valley is drained by the St. Austell River, which flows from north to south. It passes 125 m to the east of the proposed accommodation pods, at closest approach.

The Environment Agency (EA) has provided Detailed FRA/FCA Mapping (Product 4) for the landholding at The Meadows. The Agency's full response is attached to this letter.

As outlined earlier, the accommodation pods are situated within FRZ3 (highest risk) in the event that flood defences on the river are breached or overtopped. The only part of the landholding that lies outside FRZ3 is at the northern end, which is already occupied by the campsite reception and owner's bungalow.

The flood defence on the closest stretch of river comprises an earth embankment with stone wall along the section opposite the southern end of the Site. Due east of the accommodation pods, the crest height on the flood defences declines from 8.49 maOD (upstream end) to 7.89 maOD (downstream end); the condition of this defence is reported to be grade 4 (poor).

5. Risk of Fluvial (River) Flooding

The Historic Flood Map provided by the EA shows that the “Recorded Flood Event Outline” on this stretch of river is confined to “in-channel” (although “the absence of flooding does not mean that an area has not flooded in the past, nor guarantee it will not flood in the future”).

Product 4 includes fluvial flood level and flow data from the St Austell White River Estry-TUFLOW Model 2011 for the following scenarios: 1 in 100-year; 1 in 100-year with climate change; and 1 in 1000-year.

As illustrated upon the Model Node Location Map, the closest Model Node is WHIT01.12U.1 (NGR 200926 047988). The flood level in the 1 in 100-year event (1% AEP) with climate change is 6.67 maOD. As noted earlier, the downstream crest height on the flood defence is 7.89 maOD.

The EA’s standing advice for Minor Developments requires that Finished Floor Level (FFL) in new buildings is 300 mm above the estimated flood level.

It is considered that this same advice should apply to the design of the accommodation pods *i.e.* FFL should be set at 6.97 maOD.

6. Risk of Tidal Flooding

The topographic survey shows that the Site is not at risk of tidal flooding.

As stated previously, ground level at the footprint of the accommodation pods is 5.70-6.15 maOD.

7. Risk of Flooding from Rainfall Runoff (Overland Flow)

The Strategic Flood Risk Assessment (SFRA) published by Cornwall Council, together with interactive mapping, shows that risk of surface water flooding extends to cover a very similar area to that affected by fluvial flooding.

Therefore, the same advice (as presented in Section 5) would apply when considering the risk posed by flooding from rainfall runoff (overland flow).

8. Risk of Groundwater Flooding

The Council’s SFRA states that: “Groundwater flooding is linked to the ability of the ground to hold water. Due to its geology, Cornwall has only minor aquifers (2) and generally does not experience much groundwater type flooding. The exception to this is found in areas that have extensive mine drainage systems, where blockages within drainage tunnels can lead to unexpected breakout of groundwater at the surface.”

Due to the proximity of the St. Austell River, groundwater levels at the Site are expected to be controlled by the level of the river and its tributary ditches. In conjunction with the advice given above, it is considered that groundwater flooding does not pose a significant risk to the proposed buildings.

9. Surface Water Management

The drainage proposals at the Proposed Development must be measured against the existing performance of the Site, such that there is no increase in flood risk at downstream receptors.

An initial estimate of the requisite Storage Volume (SV 100-yr) has been calculated using the assessment procedure described in the document: "Preliminary rainfall runoff management for developments" (Technical Report W5-074A/TR/1, Revision E), prepared as part of the Flood and Coastal Defence R&D Programme undertaken by Defra and the EA.

Full details of the calculations are contained within the appended pdf ("HRWallingford UKSuds Storage Report IH124").

To store a proportion of rainfall run-off on Site till after the 100-yr storm has abated, the required SV 100-yr equates to *circa* 2 m³.

The runoff is coming from the roofs of the new buildings; therefore, "treatment storage" can be excluded from the total storage outlined above.

Design details (size of gutters, downpipes etc.) will need to meet the requirements of the approved building regulations Part H: drainage and water disposal.

The accommodation pods will be constructed on piled stilts. In terms of floodplain storage, this represents an improvement upon the current situation, where caravans can be sited at ground level (depleting storage space in FRZ3).

10. Access and evacuation

A flood warning and evacuation plan is a requirement for sites at risk of flooding used for holiday or short-let caravans and camping.

The owner of the campsite should sign up to the Environment Agency flood alert system for the area. This will ensure prior warning of a possible flood event and allow adequate time to prepare for flooding.

In such event, the main access and egress route for the development is on to the B2373 Pentewan Road, which is protected from fluvial flooding by the man-made defences along the St. Austell River.

If the flood defences on the river were breached, the Pentewan Road should not be used. All persons should leave the Site on foot and follow the track going westwards from the northwest corner of the landholding. This track leads on to higher ground; the outer margin of Flood Zones 2 and 3 coincides with the western boundary of the campsite.

11. Residual Risk

The campsite is in the highest risk setting for fluvial flooding (FRZ3). As outlined above, the development must be made as safe as possible by: implementing a flood warning and evacuation plan; by designing buildings to avoid flooding by raising floor levels; and by mitigating the potential impacts of flooding through design and flood resilient and resistant construction.

Residual risks are those remaining after applying the above measures.

Examples of residual flood risk include:

- The failure of flood management infrastructure such as a breach of a raised flood defence, blockage of a surface water conveyance system, overtopping of an upstream storage area, or failure of a pumped drainage system;
- A severe flood event (*e.g.* 200-year return period) that exceeds the flood management design standard, such as a flood that overtops a raised flood defence, or an intense rainfall event which the drainage system cannot cope with.

Flood-resilient buildings are designed and constructed to reduce the impact of flood water entering the building so that no permanent damage is caused, structural integrity is maintained and drying and cleaning is easier. DCLG has published “Improving the Flood Performance of New Buildings: flood resilient construction” (2007). This provides guidance on how to improve the resilience of new buildings in residual flood risk areas by the use of suitable materials and construction details.

In addition, the residual risk of flooding is addressed by ensuring that adequate flood warnings would be available to people using the development. This would need to be covered by the flood warning and evacuation plan.

I trust that the foregoing is suitable for your purposes. Please do not hesitate to contact me on [REDACTED] should you wish to discuss the matter further.

Yours sincerely

[REDACTED]
Henry Lister
Senior Hydrogeologist
BCL Consultant Hydrogeologists Limited