

Extension and Alterations to The Boathouse Green Bay, Bryher

for Mrs Marian Bennett



FLOOD RISK ASSESSMENT



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1. Introduction

Poynton Bradbury Wynter Cole Ltd (PBWC) have been commissioned to prepare designs for alterations to the existing Boathouse (a converted former agricultural barn) and the reconstruction of a redundant workshop as owners' accommodation.

Planning Policy Statement 25 "Development and Flood Risk" states that a Flood Risk Assessment (FRA) is required where proposed development is in an area where the Environment Agency (EA) have indicated there may be drainage problems. For this reason PBWC have liaised with specialist consultants, taken advice and produced this FRA.

This FRA has been prepared in accordance with Planning Policy Statement 25 "Development and Flood Risk" and as outlined by the EA Flood Risk standing advice.

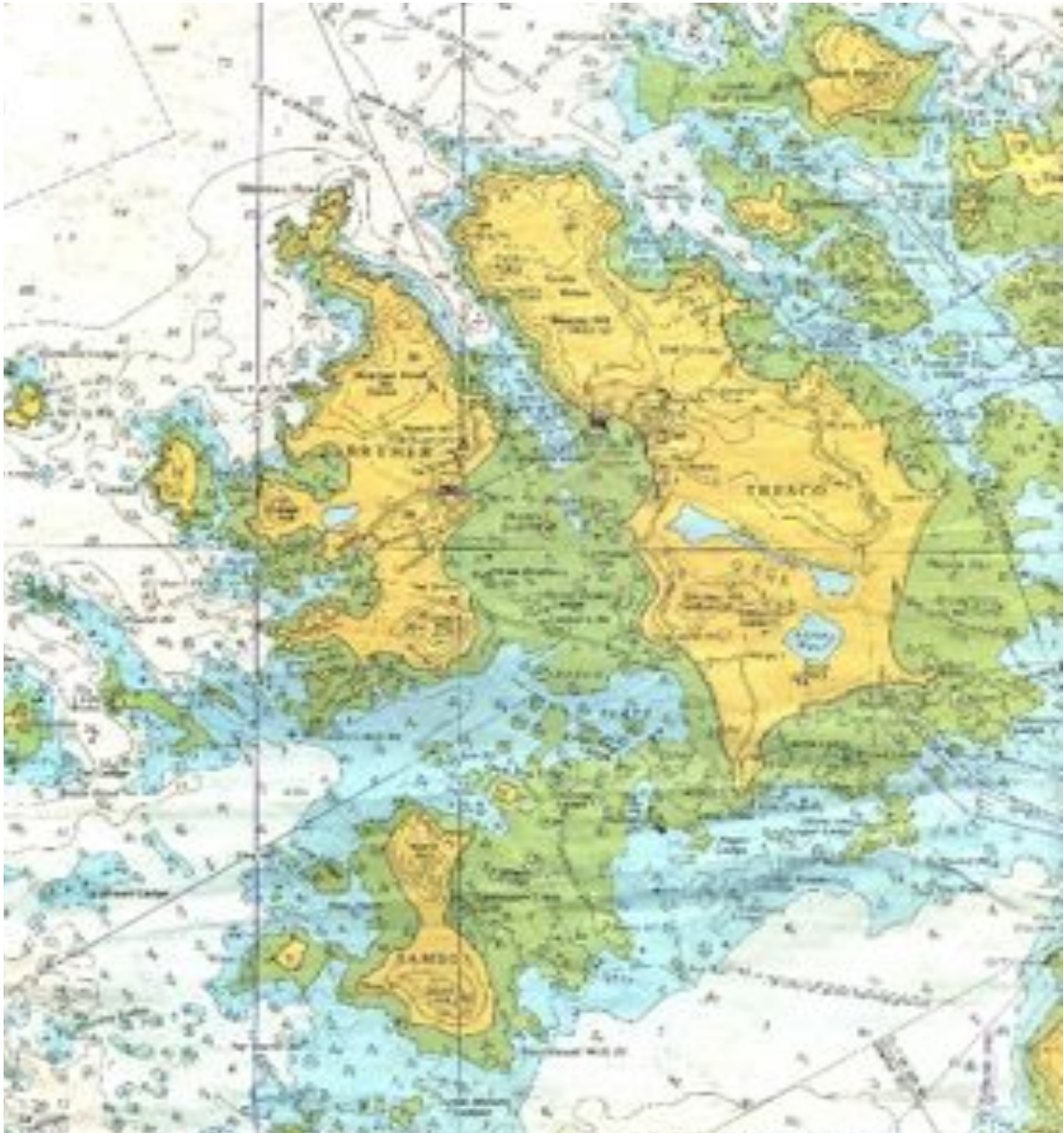
2. Site Location and Description

The site is a rectangular parcel of land set behind the Bryher coast path overlooking Green Bay. On the extract from the 1:25000 Admiralty Chart (overleaf) the Boathouse lies midway between the 0m and 10m contours above Mean High Water springs.

The site is fortunately on the eastern side of Bryher and therefore protected from the prevailing westerlies and approaching Atlantic weather. On the eastern side the land is protected by a 2m high densely planted bank at the top of the beach, which acts as an effective flood defence barrier.



Raised bank on seaward side of coast path planted with Phormium, Hottentot fig and Agapanthus.



Extract from Admiralty Chart for the Isles of Scilly showing Bryher, Treco and Samson.

3. Existing Hydrology

The EA Flood Risk map for Bryher is illustrated below. No formal flood defences built within the last five years are identified and there are no shaded areas benefiting from flood defences. It is interesting to note that the site (circled in red) is not located in either Flood Zone 2 or Flood Zone 1, despite its relatively low level.

In practical terms there is no history of either the Boathouse or workshop flooding and the man-made bund, constructed and maintained by the Bennett family over many years, has proved to be particularly effective. The only problems encountered have been during heavy rainfall when the compacted earth pathway leading past the application site ponds in the depressions created by vehicular traffic.



Environment Agency flood map for Green Bay, Bryher.

4. Design Standards

The following guidance will be taken into account in designing the Boathouse extension/ alterations and the associated landscape and infrastructure.

Environment Agency “Drainage Guidance for Cornwall”

The guidance considers the impact that drainage can have on flood risk, which complements Cornwall Council’s Strategic Flood Risk Assessment – Level 1 (SFRA1) which considers wider flood risk. The guidance provides advice on known Critical Drainage Areas, standards that are expected to be achieved for surface water drainage, the content of flood risk assessments which accompany planning applications, Sustainable Urban Drainage Systems (SUDS) and other sources of information.

The Drainage Guidance for Cornwall document, published in January 2010, takes into account the location, previous land use and size of the development site. Based on a consultation matrix, drainage standards for different sites are set out.

The guidance states that for all developments a hierarchy is taken into account for the design of surface water drainage systems. As such, surface water will be expected to drain to infiltration unless it can be demonstrated that this is not feasible.

Drain to a soakaway or infiltration system designed in accordance with the SUDS Manual – CIRIA C697, using a minimum of a 30-year return period storm.

Where an FRA demonstrates that infiltration is not viable, a sustainable drainage system should consider flow attenuation and no adverse impact on water quality.

Safe and appropriate exceedance routes in order to demonstrate no property flooding or increase in flood risk, either off site or to third parties.

Building Regulations Part H

Building Regulations Part H “Drainage and Waste Disposal” covers the design and installation of surface water systems. All private drainage including pipes, manholes, downpipes, soakaways and other drainage infrastructure on the site should be designed and installed in accordance with this document.

5. Flooding and Surface Water

Flooding mechanisms have been considered and are discussed in detail below.

Overland Flooding

The site is bounded by agricultural land to the north, west and south and, in each case, is well protected by granite walls backed by windbreak hedges (see photos below). These long-established Scillonian hedges provide effective barriers to overland/exceedance flood flows.

The new building is principally the replacement of the workshop with purpose-designed residential accommodation. There are no changes to the fabric of the old Boathouse so the original building is not considered by this report. Although there is no history of flooding within the workshop, internal ground floor levels will be raised by 100mm to ensure that internal floor finishes are 150mm above outside ground levels at all points. Overland flows should therefore not pose a threat of flooding.



View of site from west



View of site from south

Groundwater Flooding

Ordnance Survey mapping and site survey information indicates that there are no known surface water features within the site. The only minor groundwater issues are temporary ponding on the coast track leading to the beach and Bennett Boatyard (at the south end of Green Bay). In order to avoid this situation between the off-site track and the buildings, the existing topsoil will be graded back and stockpiled and a granular base will be laid over the entire forecourt to act as a large soakaway. This will provide temporary storage for groundwater on site during periods of heavy rainfall, which will then gradually dissipate into the ground below. A new stone boundary wall and raised stone threshold will be constructed on the eastern site boundary to ensure that any groundwater on the coastal path does not drain onto the application site.

Fluvial (River) Flooding

The development site is not situated near any watercourses and based on the EA's indicative flood mapping is outside Flood Zone 2, which relates to an annual risk of flooding rivers or the sea of 0.1% (1 in 1000) or less. The risk of fluvial flooding at the site is therefore not considered to be significant and not considered further within this report.

Flooding from Reservoirs, Canals and Other Artificial Sources

There are no reservoirs, canals or other artificial water sources in the vicinity of the development that may cause risk of flooding.

Tidal Flooding

The land to the west of the application site rises gradually across the isthmus that links Samson Hill to the rest of Bryher and prevents any risk of tidal flooding from Great Porth on the Atlantic side of the island. Although the site is relatively low-lying it is well protected from tidal flooding from the east by the 2m high bund illustrated in this document. Additional protection could be provided by flood barriers at the entrances to the Boathouse complex. PBWC have detailed similar barriers for a shop in Tregenna Place, St Ives, which was considered to be at risk from possible flooding of the Stennack River. Flood barriers could be manually positioned in doorways if high spring tides combined with easterly gales were expected. If the Council consider this appropriate, this could be controlled/enforced by planning condition.

Flooding as a Result of the Development

There is no increase in the building footprint so there is no additional risk from surface roofwater. Water butts will be introduced to collect roofwater so there will only be discharge into soakaways once the water storage butts are full. Foul drainage will discharge into the existing septic tank in the field beyond the south-west corner of the site. This works effectively at present and is considered suitable to serve the Boathouse and the reconstructed lean-to extension.

6. Proposed Drainage Scheme

The landscaped areas surrounding the buildings will be predominantly soft landscaping with a variety of Scillonian plants supplementing the existing stock and replacing some of the older windbreak hedging. Hard surfaces will be permeable. Roofwater, beyond the storage butts, will drain to soakaways located at least 3m from any building.

Infiltration testing should be undertaken in accordance with BRE Report 365, in order to demonstrate the viability of infiltration drainage techniques and to size soakaways.

Surface water drainage design should take into account guidance as outlined within PPS 25, 2006 Annex B. This recommends that an allowance be made for future climate change. Design of the site drainage infrastructure and SUDS is to be carried out in accordance with best practice and to industry standard design standards.

7. Conclusions

The flood risk has been assessed following the principles of PPS25 and the standing advice provided by the Environment Agency. It is concluded that the proposed development is not considered to be at significant risk of flooding and does not significantly increase the risk of flooding off-site.