

Site Specific Flood Risk Assessment

Project: Kenchwood Garage and Workshop Rebuild

Date: January 2024
Prepared by: David Johnson
Site Location: Kenchwood, Ferry Road, Hayling Island, PO11 0DA

Location and Site

Please see the following drawing(s) that are part of this planning application:

A110 - Site Plan
Boundary and Location Plan

The current occupiers have not experienced any flooding over the last 15years, and historically there are no reports of the site flooding.

The surrounding ground is gravel and sand based with a relatively thin layer of top soil. This ground is quick draining and it can be expected that any water remaining after a flood event that does not recede with the tide will fall to the water table level within hours of the event.

Design Life

The proposed development shall be analysed with reference to the impact of tidal flooding over the 100 year design life.

It should be considered that as the planned building is ancillary to the main building, which has no flood mitigation measures currently implemented. Therefore the practical lifespan of this building will be governed by the ability for the main house to be inhabited, and therefore the 100 year design life is considered generous.

Current use

The current use of the land is for dwelling purposes. The proposed development does not change this use.

Proposed Development

This proposal is considered to be for a minor development. i.e. a householder development.

The proposal is to demolish the existing garage, studio and shed and replace with a two storey building containing double garage, garden storage, pottery studio and home office.

Additionally there will be space allocated to manage solar panel control gear and batteries away from the main house.

The lower storey will be reserved for garage / toilet and garden storage, with more flood vulnerable uses on the upper storey.

Occupancy Levels

The development seeks to increase the space available for the current activities undertaken by the occupants and allows for relocation of a home office that is currently in a bedroom in the main dwelling.

Therefore the proposed development does not increase the number of users that may be expected or be resident at the site.

Vulnerability Classification

The current vulnerability classification is 'More Vulnerable'. The vulnerability classification after development does not change

Sequential test

The proposed development is classified as a minor development and therefore the sequential test does not apply. By extension the Exception Test test not apply.

Flood Zone Analysis

The site sits in both the Tidal Flood Zone 3 and Tidal Flood Zone 1. This flood risk assessment assumes the worst case of the entire development sitting in Flood Zone 3 and therefore this site specific floor risk assessment is prepared.

The only source of flooding that shall be considered for the site is that from tidal.

Fluvial and surface water are not indicated as flood risks.

Figure 1 shows the EA flood risk map, Figure 2 shows the risk from surface water (no risk)

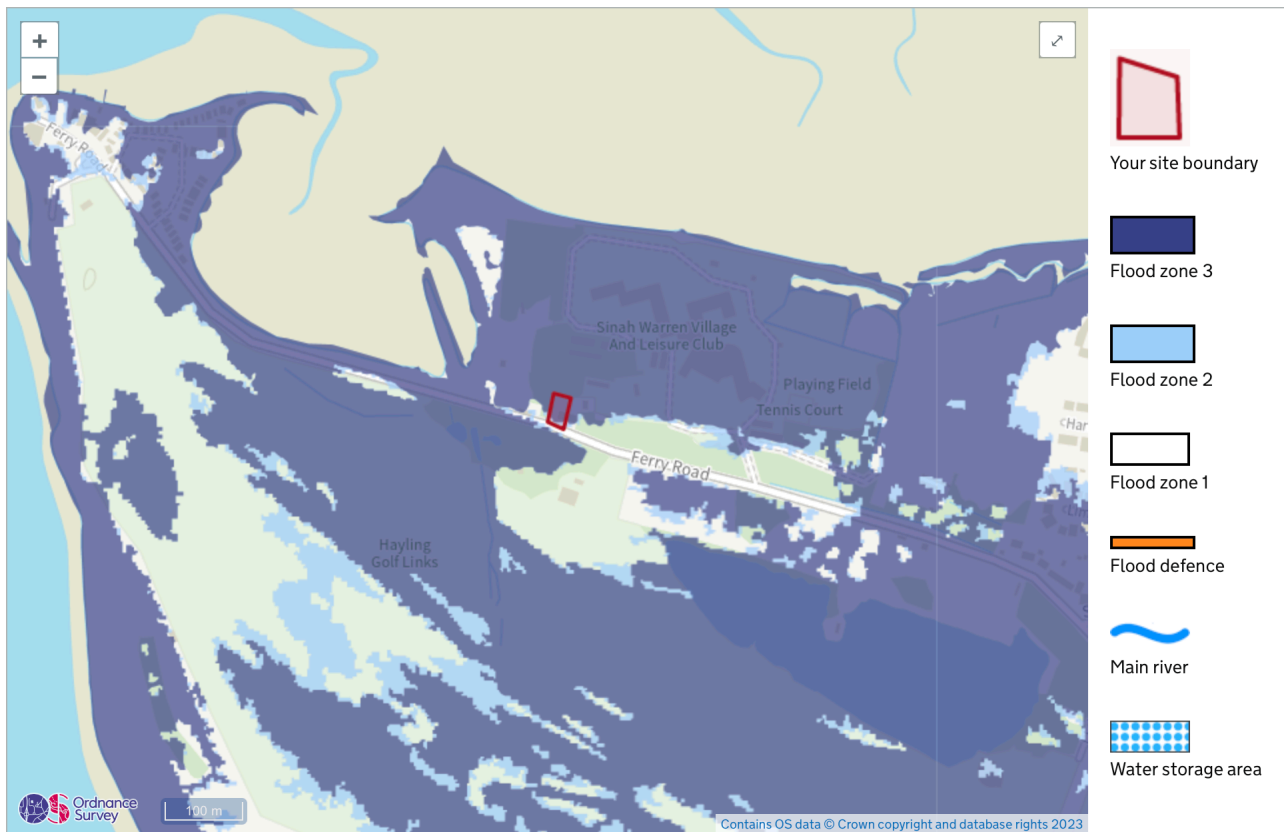


FIGURE 1- PO11 ODA FLOOD RISK MAP

[https://flood-map-for-planning.service.gov.uk/flood-zone-results?polygon=\[\[469490,99612\],\[469499,99648\],\[469520,99643\],\[469509,99603\],\[469490,99612\]\]¢er=\[469505,99625\]&location=PO110DA](https://flood-map-for-planning.service.gov.uk/flood-zone-results?polygon=[[469490,99612],[469499,99648],[469520,99643],[469509,99603],[469490,99612]]¢er=[469505,99625]&location=PO110DA), Accessed 05/12/2023

Flood risk

Location

Extent of flooding

PO110DA



Extent of flooding from surface water

● High ● Medium ● Low ○ Very low ⊕ Location you selected

FIGURE 2 - PO11 0DA SURFACE WATER RISK

[https://check-long-term-flood-risk.service.gov.uk/map?](https://check-long-term-flood-risk.service.gov.uk/map?easting=469505&northing=99625&map=SurfaceWater)

[easting=469505&northing=99625&map=SurfaceWater](https://check-long-term-flood-risk.service.gov.uk/map?easting=469505&northing=99625&map=SurfaceWater), Accessed 05/12/2023

Design Flood Levels

Extreme Flood Levels

The site has been analysed to assess the impacts of extreme sea levels at a 200 year return level. The methodology is given in Appendix I.

The extreme flood level for the site has been calculated at 3.32m AOD

Effect of climate change

A further calculation was undertaken to assess the likely rise in sea level over the 100 year lifespan of the proposed development. The methodology is given in Appendix II

The baseline rise in sea level over the 100 year lifespan had been calculated at 1.03m AOD

Resulting design flood level

At the 100 year point the predicted maximum inundation of the site in a 200 year return period is 4.35m AOD (3.32m predicted extreme sea level + 1.03m base level rise due to climate change).

This figure will be used to inform the design of the development such that the effects of flooding are minimised and manageable.

The designed floor levels for the development are 3.45m AOD for the ground floor and 5.85m AOD for the first floor.

At the ground floor level flood heights up to a maximum level of 0.9m (4.35m design flood level AOD - 3.45m planned floor level AOD) can be expected over the 100 year life of the building using the 1 in 200 return levels.

Implications for design

Considering the design in relation to the existing buildings and the desire to use the space as a garage and as garden storage it is not practicable to raise the ground floor height to above the design flood levels.

The first floor is above the flood risk level and therefore presents opportunity to move plant and services and flood sensitive uses above the predicted extreme tide levels.

The ground floor strategy is not to try and resist the floodwater, but rather to construct in a way that makes the building resilient to flooding both internal and external. The following mitigations are planned:

- The ground floor is given over to uses that are less vulnerable to flooding (Garage and Storage Shed)
- Electrical outlets and connections will be placed at heights >0.9m AOD above FFL
- All fixed plant (solar controllers, battery, consumer unit, compressor etc) will be placed in a plant room on the first floor.
- Structural elements of the building will be constructed from materials that are resistant to sporadic immersion -
 - Walls: steel with masonry infill up to minimum 1M above FFL with zinc standing seam cladding to external faces, pointed blockwork to interior faces. Insulation where used will be closed cell
 - Floors: Solid concrete.

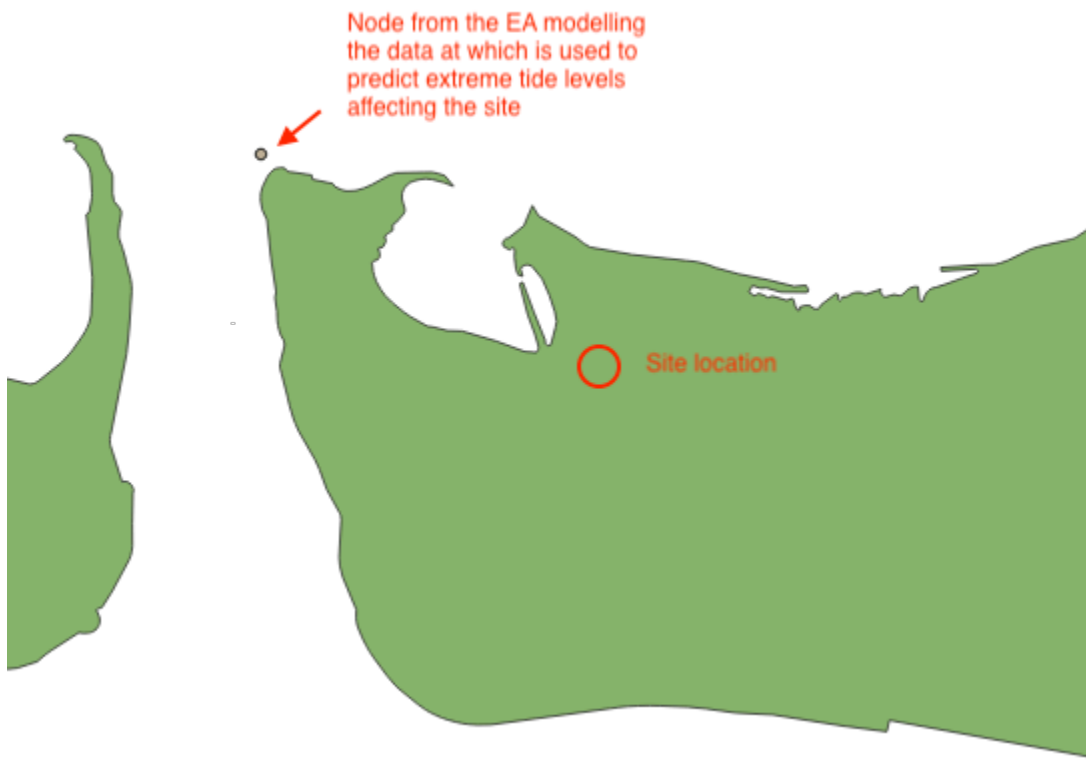
APPENDIX I

Extreme Sea Level calculation

1. The Extreme Sea level map data was downloaded from the government data website and plotted in QGIS3.0 Software along with a shapefile of the boundaries of the UK.
2. The Extreme Sea Levels Estuary values is part of the Coastal Design/Extreme Sea Levels, a GIS dataset and supporting information providing design / extreme sea level and typical surge information around the coastline of the UK, including England, Wales, Scotland, Northern Ireland, Isle of Man and Jersey. The information is relevant under present day (year 2018) conditions and does not account for future
3. The data was accessed on 03/12/2023 from:

<https://data.gov.uk/dataset/5b9a5a99-e996-431b-b001-f364d53736f0/coastal-design-sea-levels-coastal-flood-boundary-extreme-sea-levels-estuary-2018>

4. The data gives the return probability for extreme flood events at the location of interest. This is taken as the nearest point to the site, and is shown on the map below.



5. The output meta data for that node is given below

Feature	Value
Coastal_Design_Sea_Leve...	
location	ESTUARY_SolentDowns
(Derived)	
(Actions)	
location	ESTUARY_SolentDowns
chainage	_4610.1
x_bng	468789.99590000
y_bng	100080.00160000
base_year	2017
hat_od	9999.00000000
mhws_od	9999.00000000
t1	2.65000000
t2	2.71000000
t5	2.81000000
t10	2.88000000
t20	2.95000000
t25	2.97000000
t50	3.04000000
t75	3.08000000
t100	3.11000000
t150	3.15000000
t200	3.18000000
t250	3.20000000
t300	3.22000000
t500	3.26000000
t1000	3.34000000
t10000	3.57000000
c1_t1	2.64000000
c1_t2	2.69000000
c1_t5	2.78000000
c1_t10	2.84000000
c1_t20	2.91000000
c1_t25	2.92000000
c1_t50	2.98000000
c1_t75	3.01000000
c1_t100	3.03000000
c1_t150	3.06000000
c1_t200	3.08000000
c1_t250	3.09000000
c1_t300	3.10000000
c1_t500	3.12000000
c1_t1000	3.18000000
c1_t10000	3.30000000
c2_t1	2.69000000
c2_t2	2.75000000
c2_t5	2.84000000
c2_t10	2.91000000
c2_t20	3.00000000
c2_t25	3.03000000
c2_t50	3.11000000
c2_t75	3.17000000
c2_t100	3.22000000
c2_t150	3.27000000
c2_t200	3.32000000
c2_t250	3.36000000
c2_t300	3.39000000
c2_t500	3.46000000
c2_t1000	3.59000000
c2_t10000	4.05000000

6. The methodology to interpret these results is contained in:

*Coastal flood boundary conditions for the UK: update 2018 . Published by: Environment Agency
Horizon House, Deanery Road, Bristol BS1 5A*

- Using the t _200 level which indicates extreme tidal events and a return period of 200 years the maximum tide level is predicted at 3.18 AOD (above ordnance datum).
- To allow for statistical uncertainty the value for C2_t200 will be used as the design value. This gives a high degree of certainty that the extreme tidal level will be no more than 3.32 AOD in the 200 year return period and thus represents a reasonable worst case scenario.

APPENDIX II

Modelling Climate Change

9. The extreme tide level only deals with the sea levels as they are today. To get a future value for the likely impact of sea level rise a further calculation must be performed

10. The methodology described in this website was used

<https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances#how-to-use-a-range-of-allowances-to-assess-flood-risk>

Accessed 03/12/2023

11. Using table 3 and south east higher central as the reference, for the purposes of the design flood levels the methodology indicates that the sea level rises will be 1.03m for the period of 2023 to 2123 (100 year design life of the new development)

2023-2035	68mm rise	(5.7mm x12y)
2036-2065	261mm rise	(8,7mm x 30y)
2066-2095	348mm rise	(11.6mm x 30y)
2096-2123	356mm rise	(13.1mm x 27y)

Total 1.033cm / 1.03M