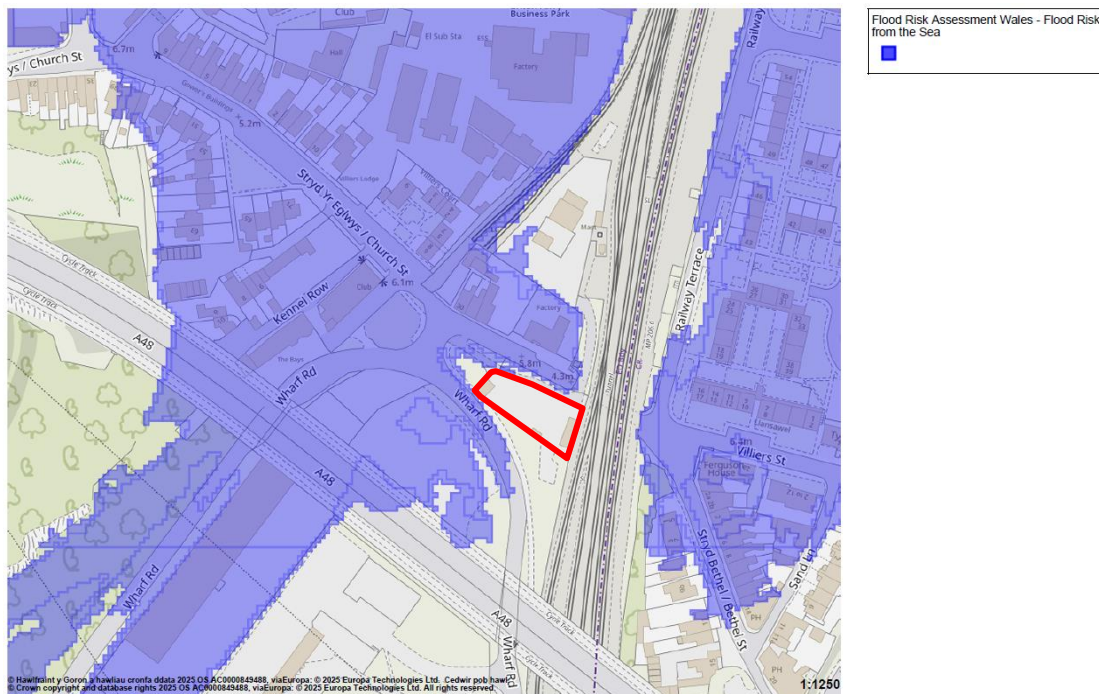


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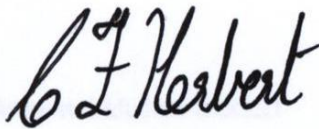
Ponderosa, Briton Ferry Flood Consequence Assessment Report



April 2025
Final
Revision B

Project	Ponderosa, Briton Ferry
Document	Flood Consequence Assessment Report
Status	Final
Revision	B
Report Number	C/WWG/P/2425
Date	April 2025
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Signed 

Date April 2025.....

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1 INTRODUCTION

Ponderosa is a residential family compound, located on a previously developed site off Church Street, Briton Ferry. The compound consists of a day room, static caravan, touring caravan, parking area, garden shed and kennels. Part of the site, although not all, is located within Flood Zone 3 (see Figure 1.1), as shown on the Flood Map For Planning, referred to in TAN 15. This indicates that the area potentially could be at risk during a 1 in 200 year tidal event or a 1 in 100 fluvial event, taking 100 years of climate change into consideration. The applicant appreciates, therefore, the need to assess the consequence of flooding.

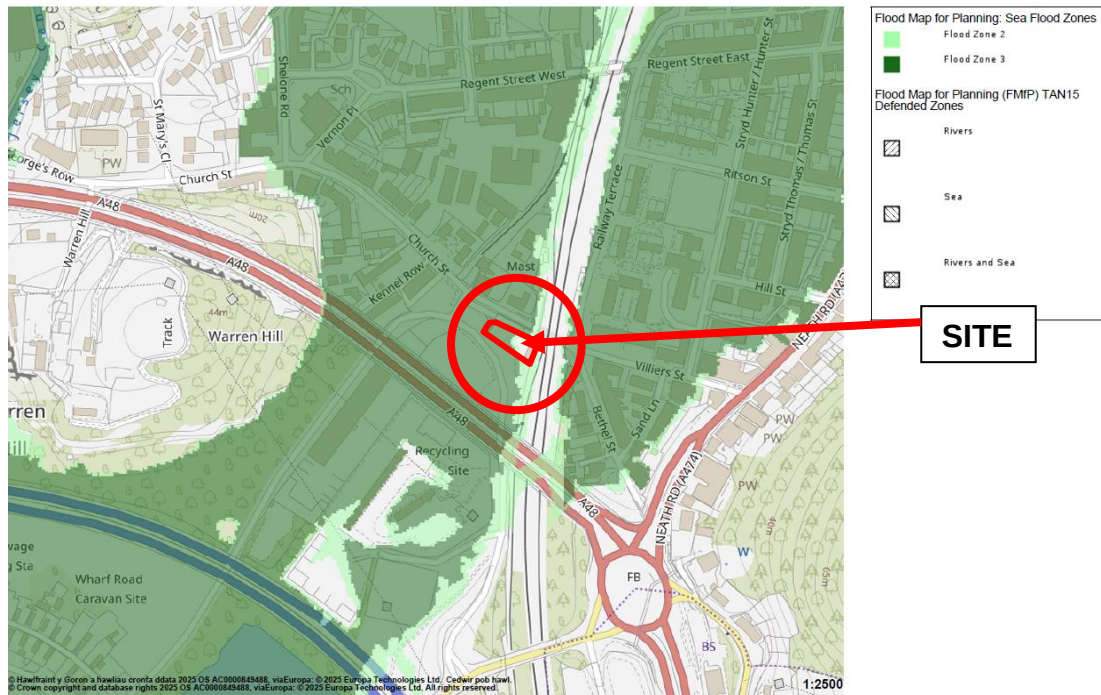


Figure 1.1 – Sea Flood Map For Planning

The prime objective of the Flood Consequences Assessment is to develop an appreciation of:

- The risk and consequences of flooding on the development; and
- The risk and consequences (i.e. the overall impacts) of the development on flood risk elsewhere.

It is noted that no new highly vulnerable development, **on greenfield land**, should be permitted in Zone 3, regardless of the conclusion of any Flood Consequences Assessments. In addition, Welsh Ministers must be notified of any such proposal a planning authority intends to approve. **In this instance, however, the proposals are located on a developed site.**

The assessment should consider a range of potential flooding scenarios including a 1 in 1000 year event with an allowance for climate change in line with current Welsh Government guidance.

It is noted that the Flood Map for Planning allows for 100 years of climate change. Where a new development has a shorter lifetime, it is reasonable that the flood consequences assessment focusses on potential risks during the development's expected lifetime.

This assessment will help the planning authority determine whether the risk and consequences of flooding are acceptable and can be managed over the lifetime of development. The assessment will also establish whether appropriate measures can be incorporated into the design to ensure that the risk to life, damage to property and disruption to people, over its lifetime, are minimised and that there is no increase in the risk of flooding elsewhere.

The National Strategy recognises that many communities are located in areas at higher risk from flooding. TAN 15, however, recognises that these communities must be allowed to adapt, change, and regenerate in the knowledge of what the science is showing. Nevertheless, development and redevelopment should be avoided where there is a risk of being impacted by coastal erosion over the lifetime of the development.

The Flood Map For Planning are based on the Flood Risk Assessment Maps plus 100 years of climate change. The maps adopt the precautionary principle and are based on the best known information available at the time. However, a detailed examination of a site can refine an area's risk of flooding.

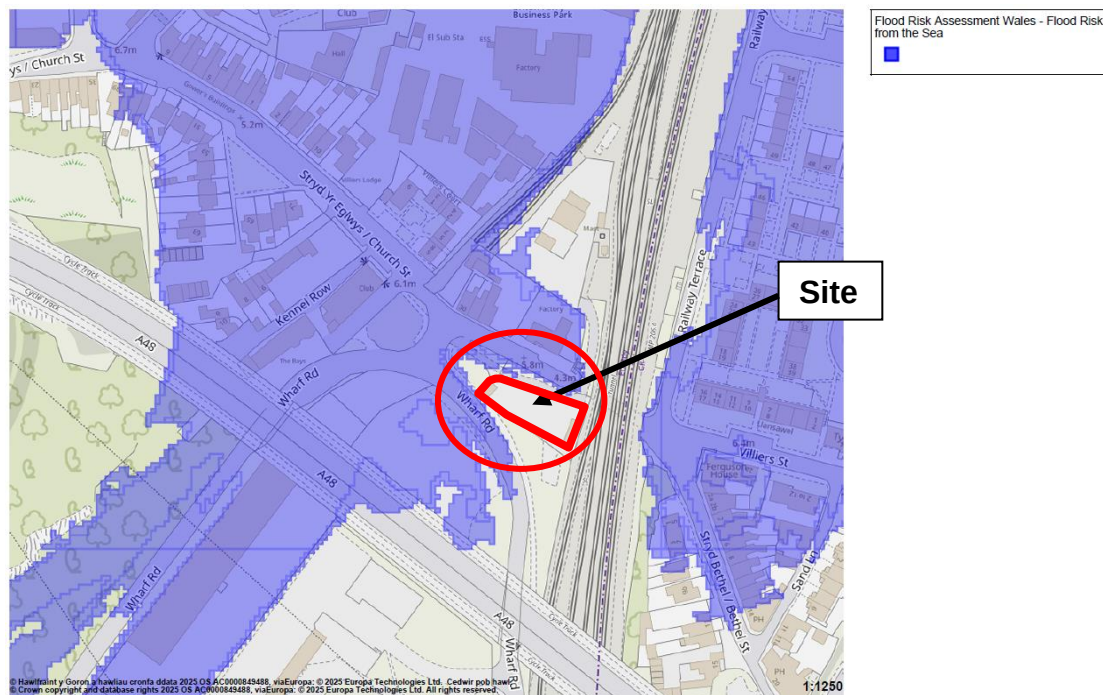


Figure 1.2 – Sea Flood Risk Assessment Map

Considering the proximity of the site to the Tidal Afon Nedd, it is possible that the development could be at risk of both tidal and fluvial inundation. With this in mind, the client recognises the need to undertake a Flood Consequence Assessment to evaluate the risk and the implication of any flooding on the site. The assessment should be in accordance with the requirements of Section 11 of TAN 15. Francis Sant have been employed to undertake this task based on information currently available (ie. no additional modelling).

Section 2 of this report describes the location of the development while the method and risk of flooding, from various sources, are considered in Section 3. Section 4 considers sustainable drainage and potential resilient measures are discussed in

Section 5. The conclusions of the study, along with the main recommendations, are provided in Section 6.

2 THE DEVELOPMENT

The proposed site (coordinates 273945, 194060) is situated off Church Street, towards the southern end of Britton Ferry (see Figure 2.1 to 2.3 and Plate 2.1). The main Paddington to Fishguard railway line lies immediately to the east and the A48 overpass is some 55m to the south. Afon Nedd is 550m to the west while the open sea, of Swansea Bay, is some 3km to the south west. The area is used for both commercial and residential purposes. The site was previously used for a compound area with a number of buildings.

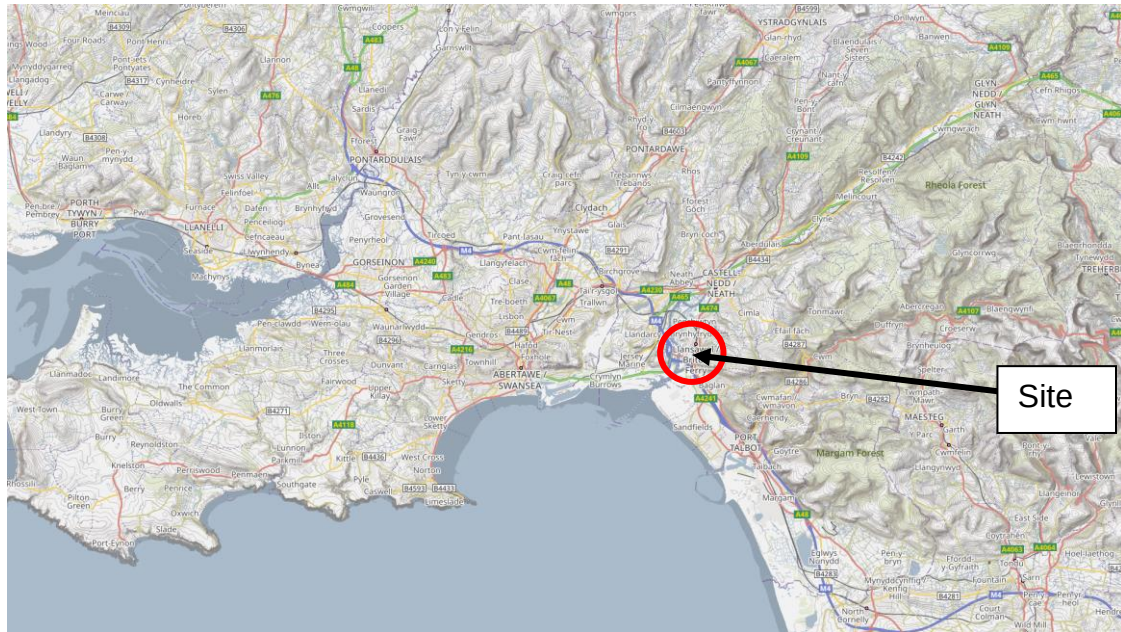


Figure 2.1 – Location Plan

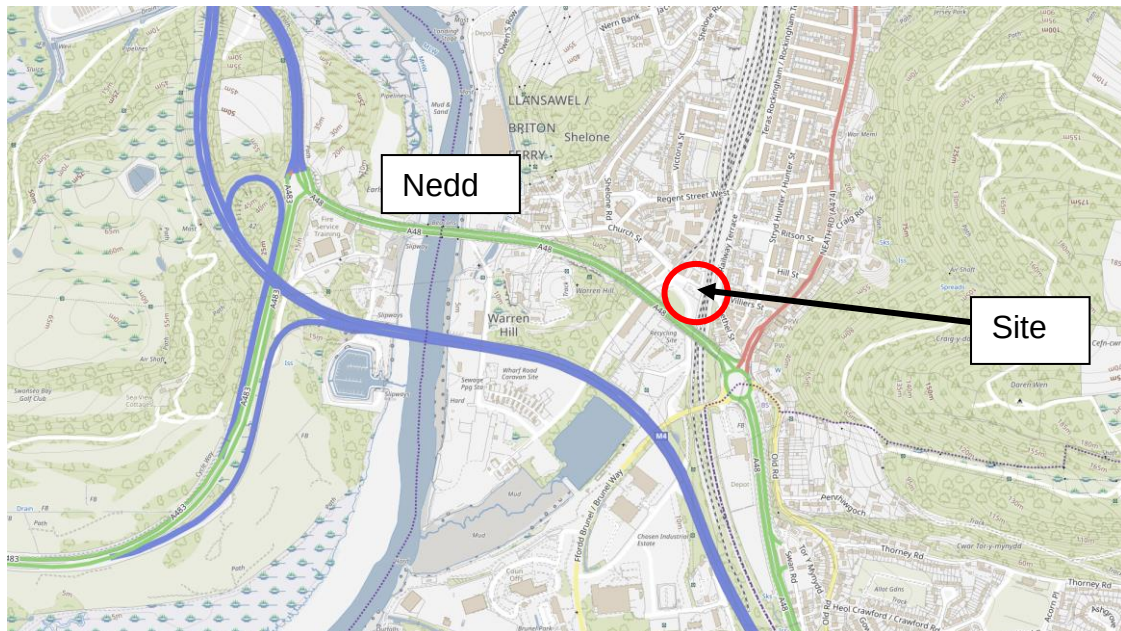


Figure 2.2 – Plan of Area

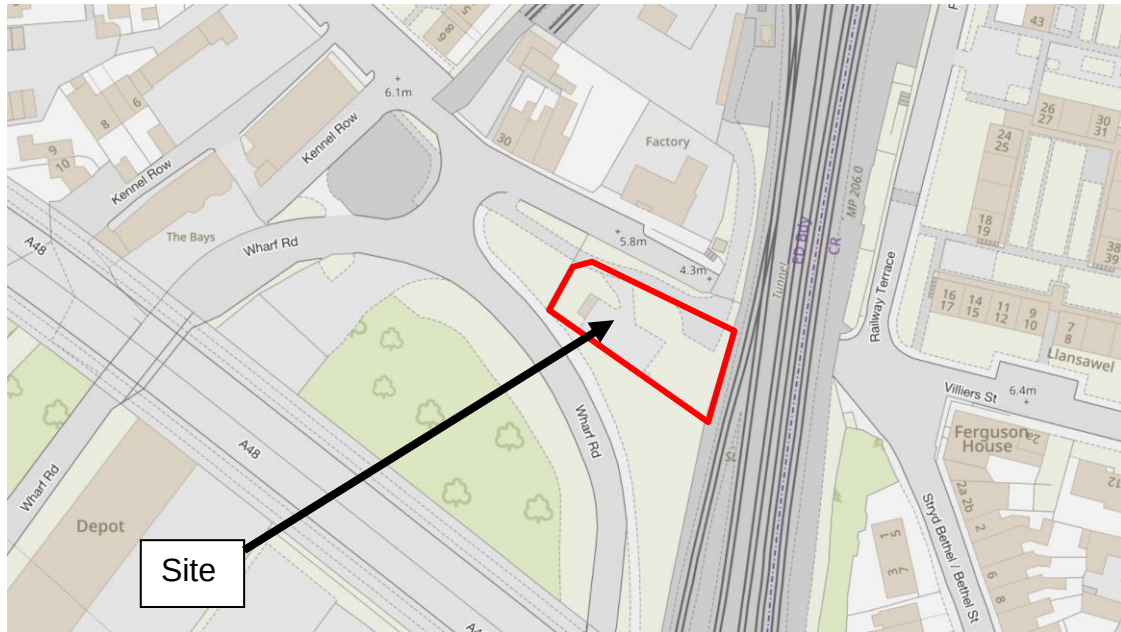


Figure 2.3 – Plan of Site

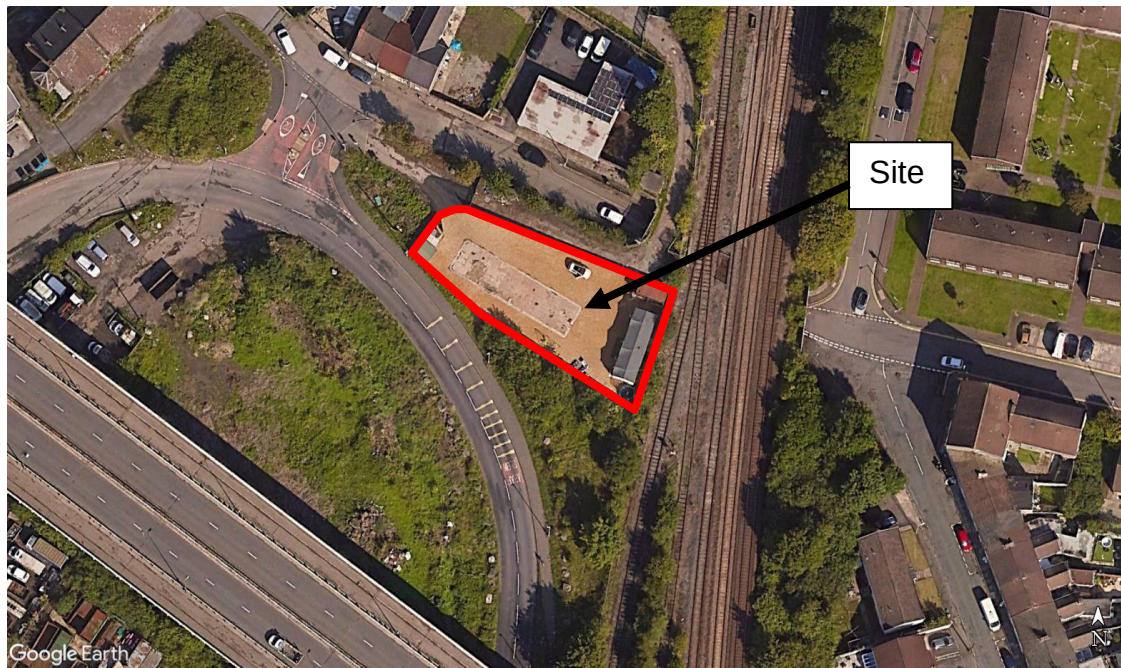


Plate 2.1 – Aerial View of Site

Development

The proposed development is located on a previously used site with the previous buildings being demolished. The compound consists of a day room, static caravan, touring caravan, parking area, garden shed and kennels (see Figure 2.4 to 2.8). Previously the family had been located on a pitch on lower ground sited closer to the tidal river, currently at risk of flooding.

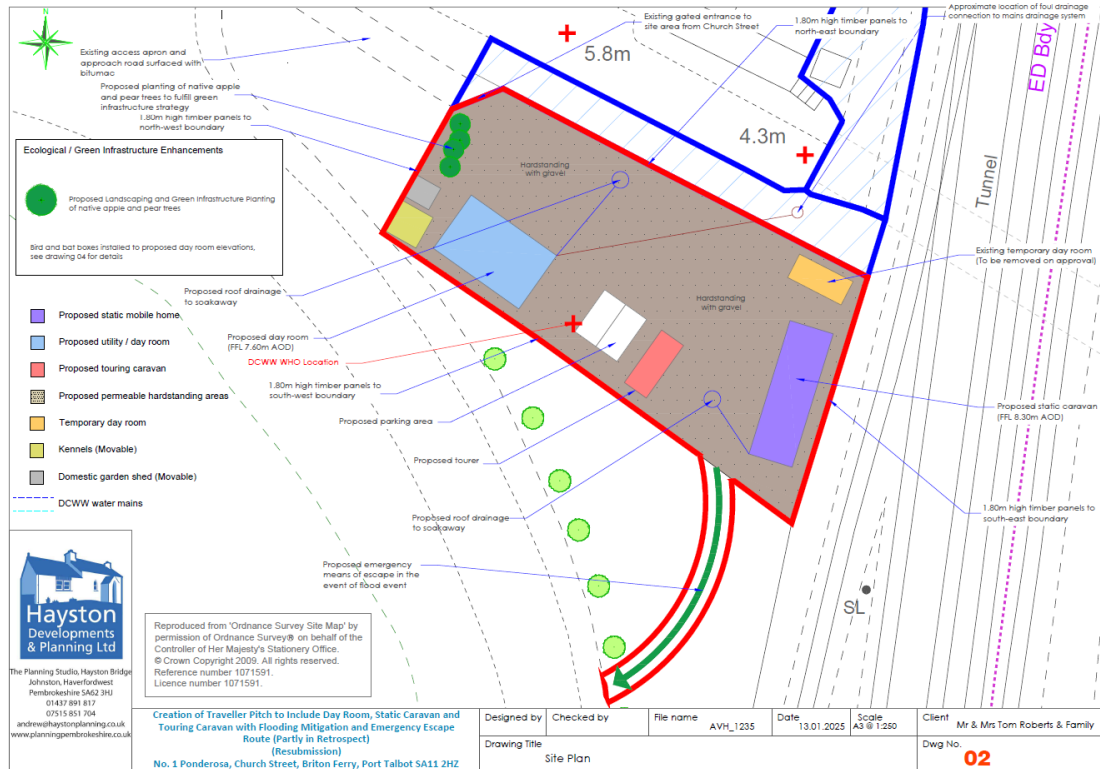


Figure 2.4 – Ponderosa Compound

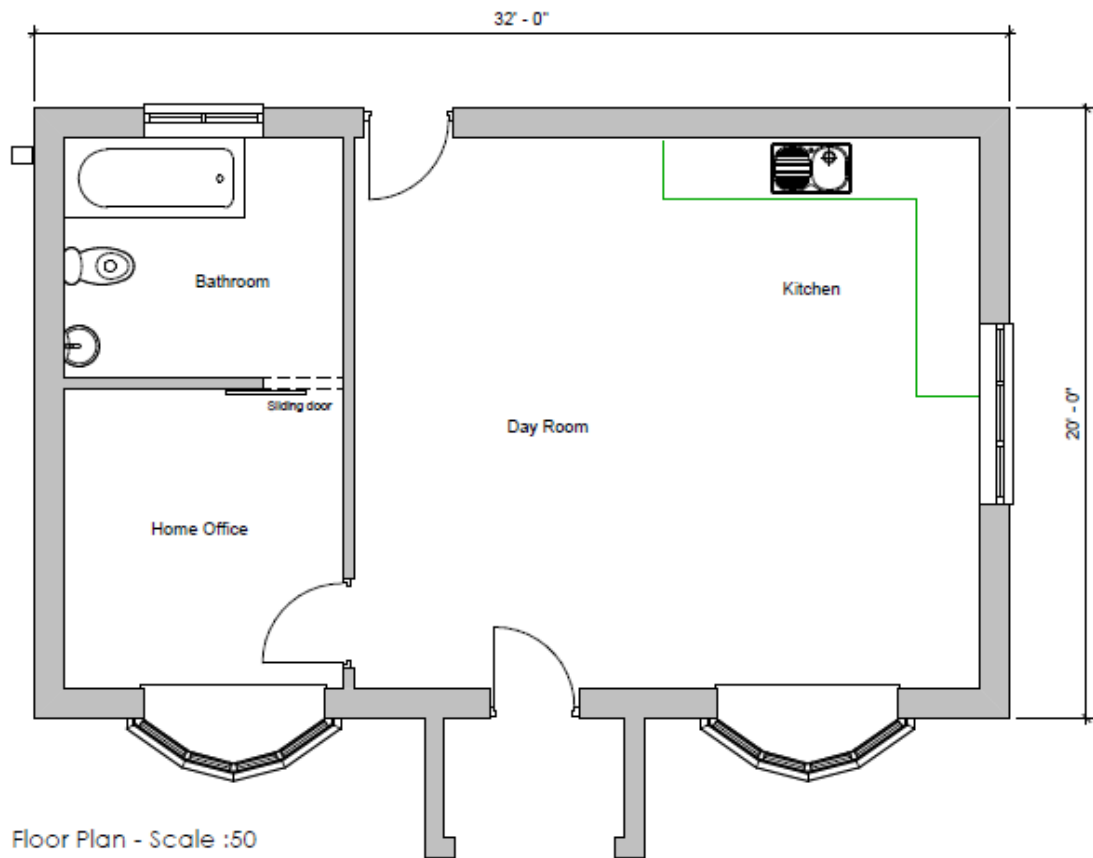


Figure 2.5 – Floor Plan of Proposed Day Room



Figure 2.6 – Front Elevation of Proposed Dayroom

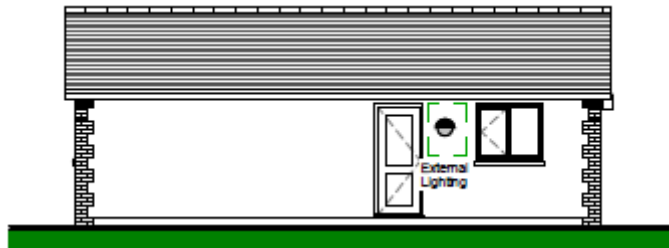


Figure 2.7 – Rear Elevation of Proposed Dayroom

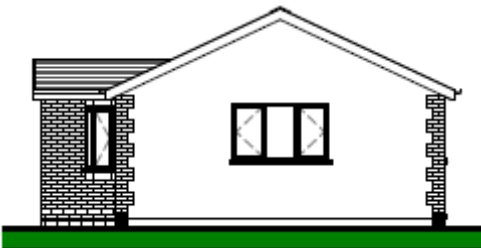


Figure 2.8 – Side Elevation of Proposed Dayroom

Topography

A topographic survey shows that the current site levels range between 7.267m AOD, near the entrance, and 7.958m AOD, on the upper end of the site (see Figure 2.9). LIDAR data (see Figure 2.10) confirms that the ground levels are in this range with the ground generally falling from south east to north west, towards the main entrance.

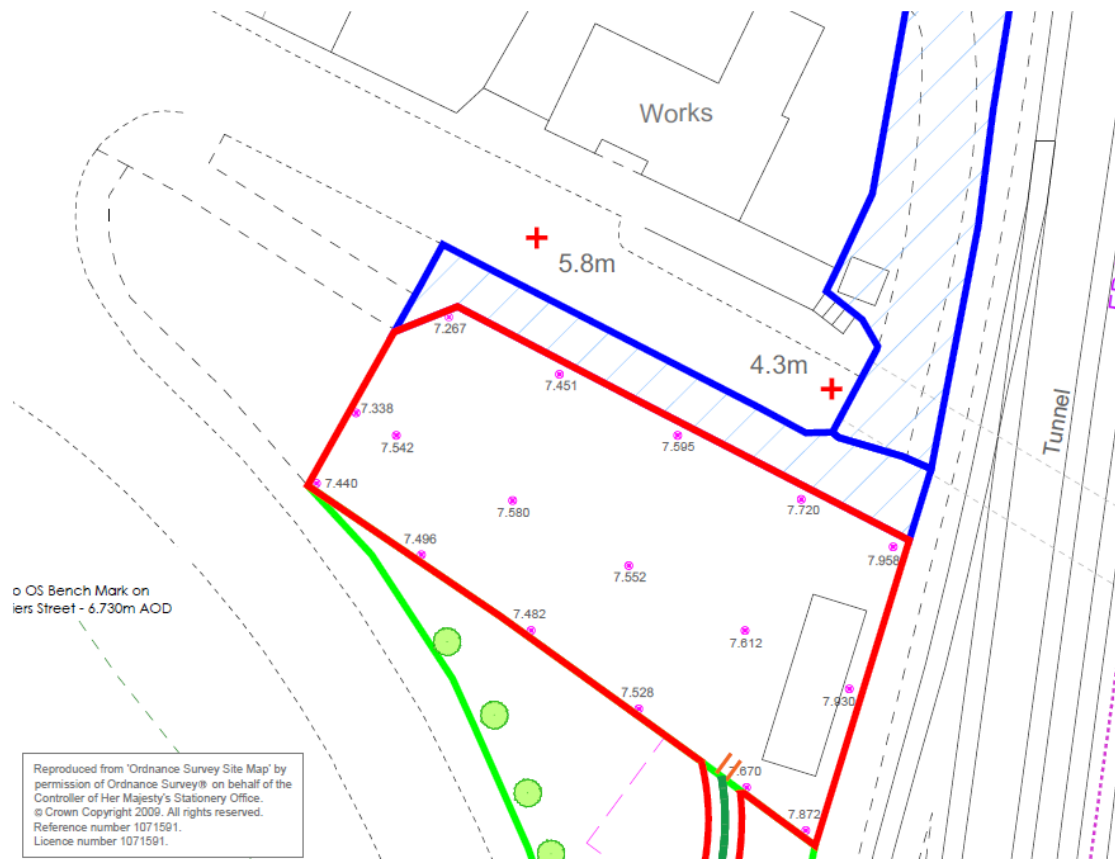


Figure 2.9 – Topographic Survey of the Site

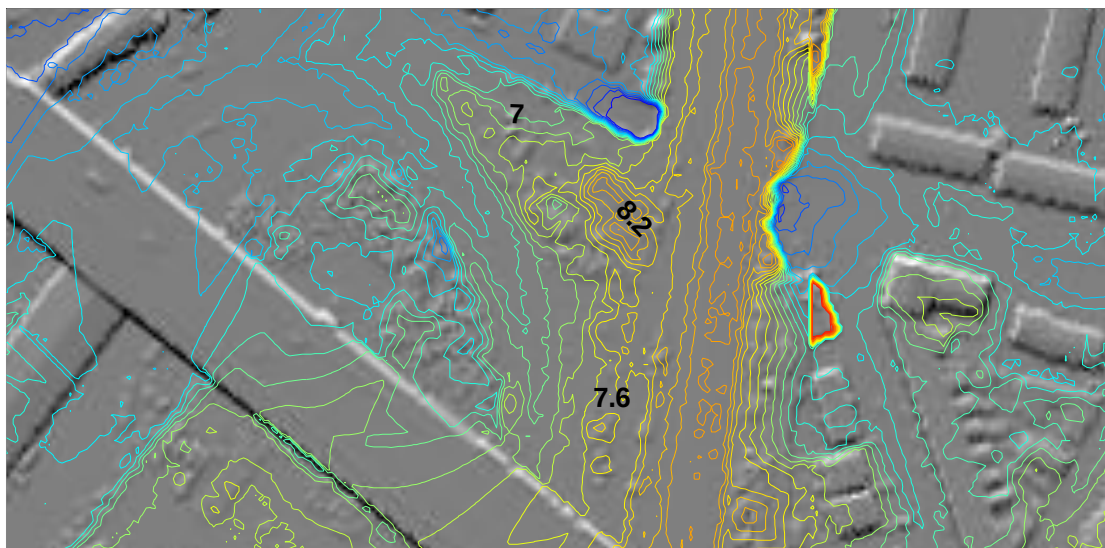


Figure 2.10 – LIDAR Data of the Site

3 FLOOD RISK

Flooding can occur from several sources, some of which are considered in this section. Currently the site is not at risk of flooding from a river, the sea or from surface water or a minor watercourse.

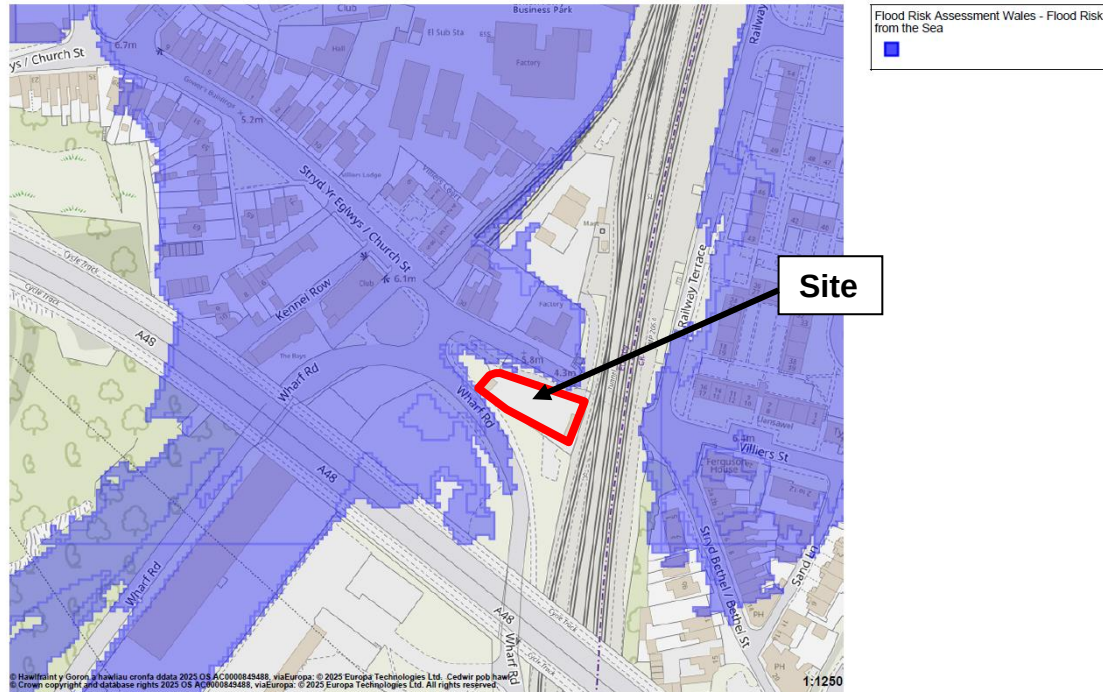


Figure 3.1 – Flood Risk Assessment Map

Fluvial

The Flood Map For Planning, which takes climate change into consideration (100 years), shows that the site is not at risk of flooding from a river during either the Q100 or Q1000 events (see Figure 3.2).

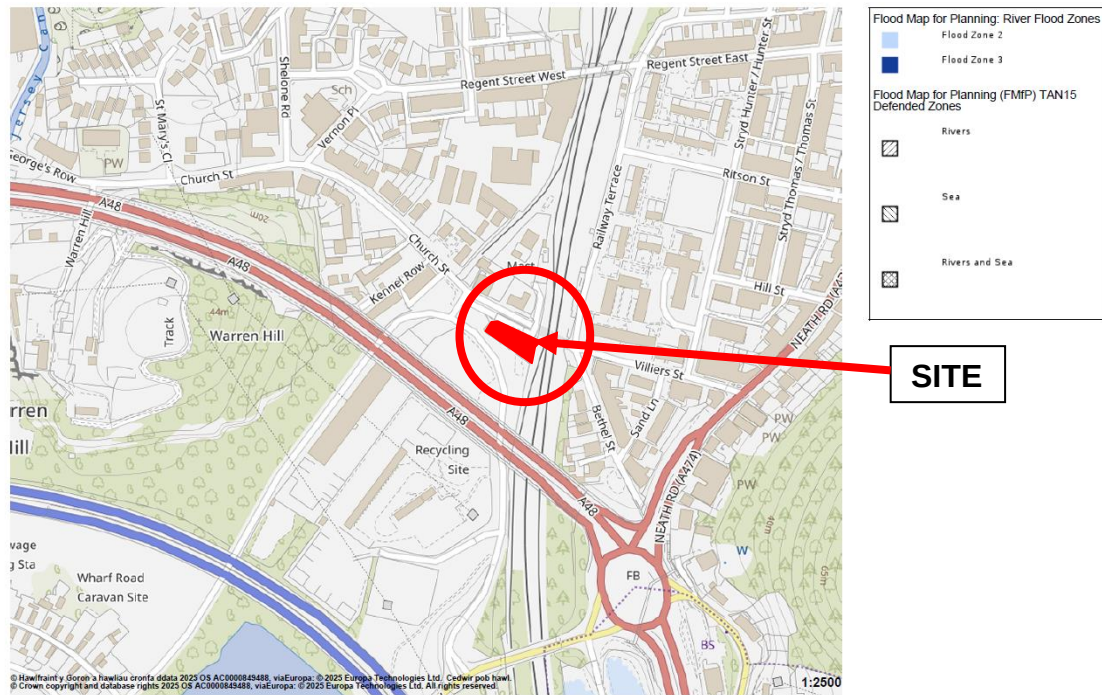


Figure 3.2 – River Flood Map For Planning

Tidal

The Tidal Flood Map For Planning (see Figure 3.3) would suggest that, with sea level rise, part of the site could potentially be at risk of flooding during both the T200 and T1000 events and merits further investigation.

The method promoted in the coastal flood boundary conditions (for UK mainland) research project, as amended (2018), has been used to determine the T200 and T1000 high tide levels. This accounts for the joint probability of meteorological (surges etc) and astrological effects (the impact of the sun and the moon) on the tide. The levels for the adjacent coast were obtained for the T200 and T1000 events and have a 95% confidence level. The 97.5% precautionary values were also considered and are provided in Table 3.1 (base year 2017).

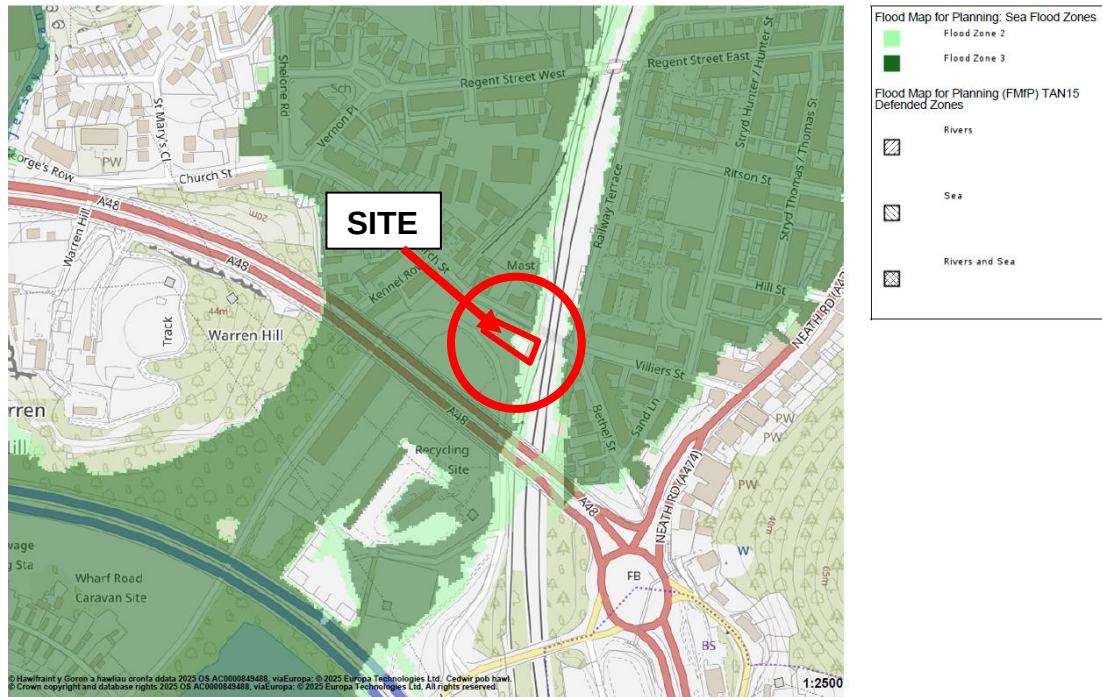


Figure 3.3 – Sea Flood Map For Planning

Table 3.1 - Water Surface Extreme Tide Elevation (m AOD)			
T200 (0.5%)		T1000 (0.1%)	
Level	97.5% Confidence	Level	97.5% Confidence
6.43	6.62	6.69	7.08

In addition, the current tide levels should be increased by the expected design life of the development, 100 years of sea level rise usually taken for a new highly vulnerable development (such as a dwelling). The derived T200 year and T1000 year levels, using the above approach, are provided in Table 3.2. Planning permission potentially could be limited to 50 years which, as required by TAN15, would reduce the number of years of sea level rise.

Table 3.2 Tide Levels With Sea Level Rise					
	2017	Current	50 years of sea level rise	75 years of sea level rise	100 years of sea level rise
T200	6.43	6.458	6.932	7.264	7.627
T200 Precautionary	6.62	6.648	7.122	7.454	7.817
T1000	6.69	6.718	7.192	7.524	7.887
T1000 Precautionary	7.08	7.108	7.582	7.914	8.277

From Table 3.2 the T200 event flood level (with 95% confidence of non exceedance), with 100 years of sea level rise, can be taken as 7.627m AOD while the T1000 flood level can be taken as 7.887m AOD. Precautionary, the levels could be increased to 7.817m AOD and 8.277m AOD during the T200 and T1000 events respectively. However, planning permission is only sought for 50 years with a T200 level of 6.932m AOD and T1000 level of 7.192m AOD

TAN 15 require the development to be flood free during the T200 event and manageable during the T1000 (depth less than 600mm). For 100 years of sea level rise the site levels should, therefore, be raised to above 7.627m AOD which would also mean that the flood depth will be less than 600mm during a T1000 event (with 95% confidence of non exceedance). Precautionary, the site level could be set at 7.817m AOD. The static caravan is expected to remain flood free even during the T1000 event providing a place of refuge if required.

With 50 years of sea level rise the site, along with the access route to Brunel Way is expected to remain flood free during the T200 and T1000 event (see Figure 3.4).

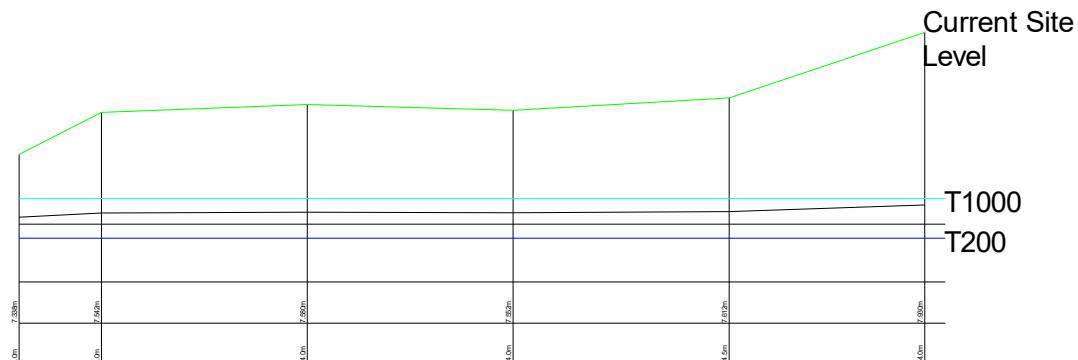


Figure 3.4 – Section Through Existing Site

As the source of flooding is tidal, even with 100 years of sea level rise, a reasonable flood warning period is likely (measured in days) allowing the site to be evacuated if necessary. An evacuation route, with a manageable flood risk, to Brunel Way is also available should it become necessary to evacuate the site at the height of an event (see Flood Response Plan).

The coastline is open to waves from the Atlantic, with a long fetch length and the potential for quite large waves. However, considering the site is located over 3km from the open coast it is not expected to be at risk of direct wave damage or flooding from overtopping of waves.

The erosion over 100 years on the open coast is expected to be less than 6m where the policy is managed realignment. Within the Nedd estuary, however, the Shoreline Management Plan policy is 'hold the line'.

Surface Water

The surface water and minor watercourse Flood Map For Planning indicates that the site is not at risk of flooding during either the Q100 or Q1000 events (see Figure 3.5). Standard precautionary measures should, therefore, be sufficient to protect the development from flooding from this source.

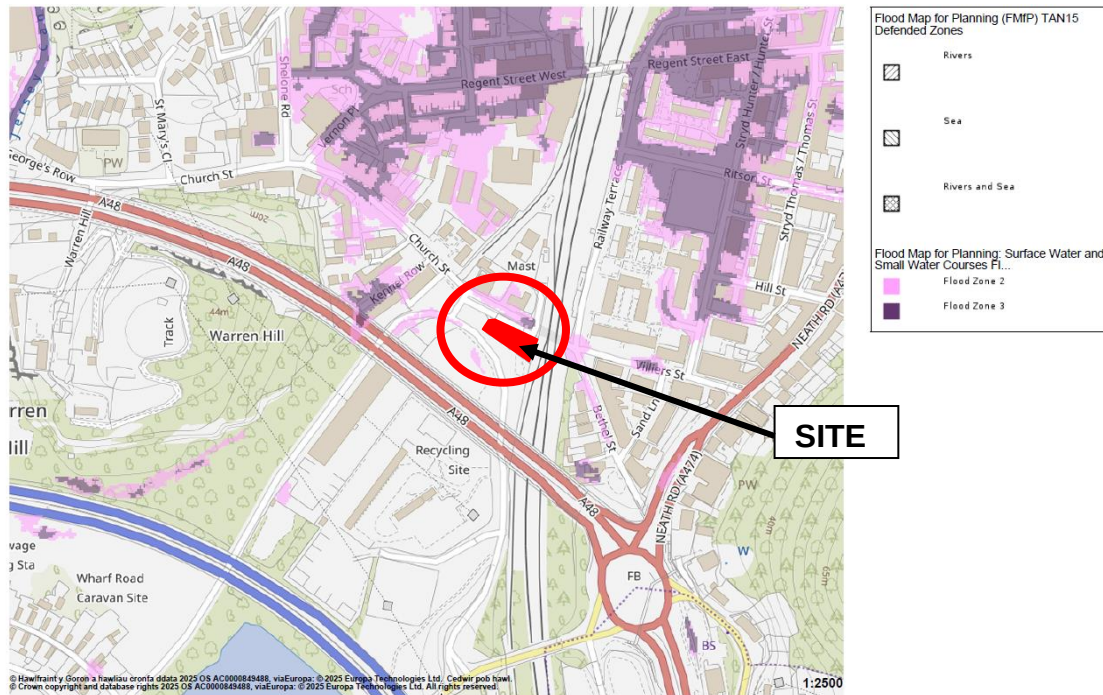


Figure 3.5 - Surface Water Flood Map For Planning

Ground Water

The bedrock geology consists of Sandstone, of the Rhondda Member (see Figure 3.6), with superficial material of Clay Silt and Sand, from tidal flats deposits (see Figure 3.7). However, when taking the topography into consideration, the risk of ground water flooding is assessed to be low.



Figure 3.6 - Bedrock Geology



Figure 3.7 - Superficial Geology

Sewage Backflow.

Potentially water could backflow into the site via the sewer system and consideration should be given to installation a non return valve.

Risk From Reservoir Failure

The site is not considered to be at risk from reservoir failure.

4 SUSTAINABLE DRAINAGE

A sustainable drainage solution, in accordance with the Welsh Government Standards and the SUDS Manual, should be incorporated into the design. SAB approval is also likely to be required which should be confirmed with the local authority.

It is expected that the roof water will either be disposed of via infiltration (if possible) or via the existing drainage system.

5 FLOOD RESILIENCE

Section 3 indicates that over the 50 year lifetime of the development the proposals are expected to remain flood free, however, if a design life of 100 years is proposed the development might be at risk of flooding, from a tidal source during a 1 in 1000 year event. This could result in the need for expensive repairs. As well as the direct damage flooding can impact in many other, and possibly more stressful, ways. The inconvenience of cleaning up the day room and the loss of sentimental belongings can be significant. There are ways, however, to limit and mitigate against the consequence of flood damage. This section considers some of those.

Employment of Flood Proof Procedures

Water can enter buildings:

- Around the edges of closed doors;
- Through vents;
- Seeping through cracks in the walls or floors;
- Around cables and entrance of services into the building.

Dryproofing - Preventing the water from entering a building.

In the first instance it is possible to take measures to prevent the ingress of water (dryproof) which include the following.

- There are several expensive proprietary barriers available, however, it would be more appropriate to ensure that the walls of the buildings are capable of acting as barriers themselves. Care should be taken to ensure that the walls and floors are kept in good order and that all holes and gaps around cables and ducts, entering the buildings are sealed.
- Temporary covers could be provided to any air vents. These covers should be removed once the risk of flooding is over. Alternatively, the vents should be located at a higher level.
- Seals can be installed around the external doors.
- Temporary barriers can be placed in front of external doors or flood doors could be used.

In this instance, with a 100 year design life, the site levels will need to be raised above the T200 level and the finished floor level of the building should be raised some 150mm further. This would ensure that the static caravan would remain flood free during a T1000 event providing a place of refuge if required. With a 50 year design life the site is generally expected to remain flood free during both the T200 and T1000 events.

Wetproofing - Reducing damage once the water has entered.

It may not be feasible to eliminate the risk of flooding, however, it is possible to limit the damage that the water can cause once in the building (wetproof). Where appropriate the following could be considered:

- Move valuable items to a higher level;
- Have solid concrete floors for the day room etc. Suspended floors are more difficult to clean and dry underneath.
- Ensure that the walls remain in good condition;
- Avoiding timber frame internal partitioning for the buildings. These are expensive to repair and dry;
- Where required, use non water absorbing insulation;
- Use corrosion resistant fittings such as galvanised or stainless steel in place of mild steel;

- Ensure that electric cables are fed from above. Also keep sockets away from the floor level;
- Where possible, Install machinery (eg fridges) with motors high up from the floor;
- Install solid internal and external doors, effectively sealed;
- Avoid storage heaters;
- Ensure boilers and space heaters are off the ground.

A flood response plan should be prepared for the development. All the family and visitors should be made aware of the flood risk and what actions to take during an event (eg using signs). It is important to also have as much warning as possible to allow the flood response plan to be followed safely. If available, this can be achieved by registering on the flood warning scheme provided by NRW.

Flood Response

Although the site is expected to remain floor free during a T200 event, for the life span of the development, potentially the site could remain at risk during an exceptional event.

The compound will subscribe to the Natural Resources Wales flood warning scheme, which uses the latest technology 24 hours a day to monitor rainfall, river levels and sea conditions. Combined with weather data and tidal reports from the Met Office, they can provide local area forecasts on the possibility of flooding and its likely severity.

Four different kinds of flood warning codes are issued. Three of the codes indicate the severity of the warning, and a fourth is an 'all clear', meaning the threat has passed. NRW ensure warnings are broadcasted on local radio and television, and information can also be obtained through their dedicated Floodline information service (0345 988 1188) or on their website, which is updated regularly when there is a flood risk.

The amount of warning that can be expected prior to an event depends on the source of the floodwater. A few days warning could be provided before a tidal event while only a few hours (or less) can be expected during a fluvial or surface water event. In some circumstances it may not be possible to provide a warning. In this instance as the main source of potential flooding is tidal a reasonable evacuation period is anticipated (days).

A member of the family will be designated as a Flood Warden (the name is not important but it will be the person in charge of making flood related decisions particularly during an event) and the remaining members and other residents will be made aware who this person is. All the family and visitors will be made aware of the risk of flooding and the procedures in place in the event of a warning being received.

On arriving on site visitors will be made aware, via a notice, of the risk of tidal flooding at the site (simple signage). When necessary, they will also be made aware of the procedures that are in place, and should be followed, if a warning is issued.

On receipt of a flood warning from NRW, all the family, and visitors, will be made aware that a warning has been issued and its severity. A decision will be made on whether to evacuate to a safe location, away from the coast, or to remain on site. Prior to evacuating the compound all utilities will be switched off at the mains

(electricity, water etc). No person will be allowed to return to the site until after the "all clear" has been given by NRW.

If, for whatever reason, water is seen to flow onto the adjacent road preventing a flood free access route then all should retreat to the static caravan, which is expected to remain flood free, and stay until the flooding has dissipated. An emergency flood kit will be kept in the caravan and maintained on a regular basis. The kit will include a torch, radio, food, water, a first aid kit and family entertainment.

If it subsequently becomes necessary to leave the site during an event (eg medical emergency) then the emergency access route should be followed as displayed. The route will be via a side entrance across council owned land and up to Brunel Way.



Plate 5.1 - Emergency Access Route onto Council Land

A clear plan, showing the flood response procedure, is to be kept in a prominent position. The plan will be accessible to all to make them aware that the area is in a flood risk zone and what procedures are in place to safely evacuate the site.

This plan is to be reviewed as necessary, but at least annually, and is to be kept in good order

Evacuation Route

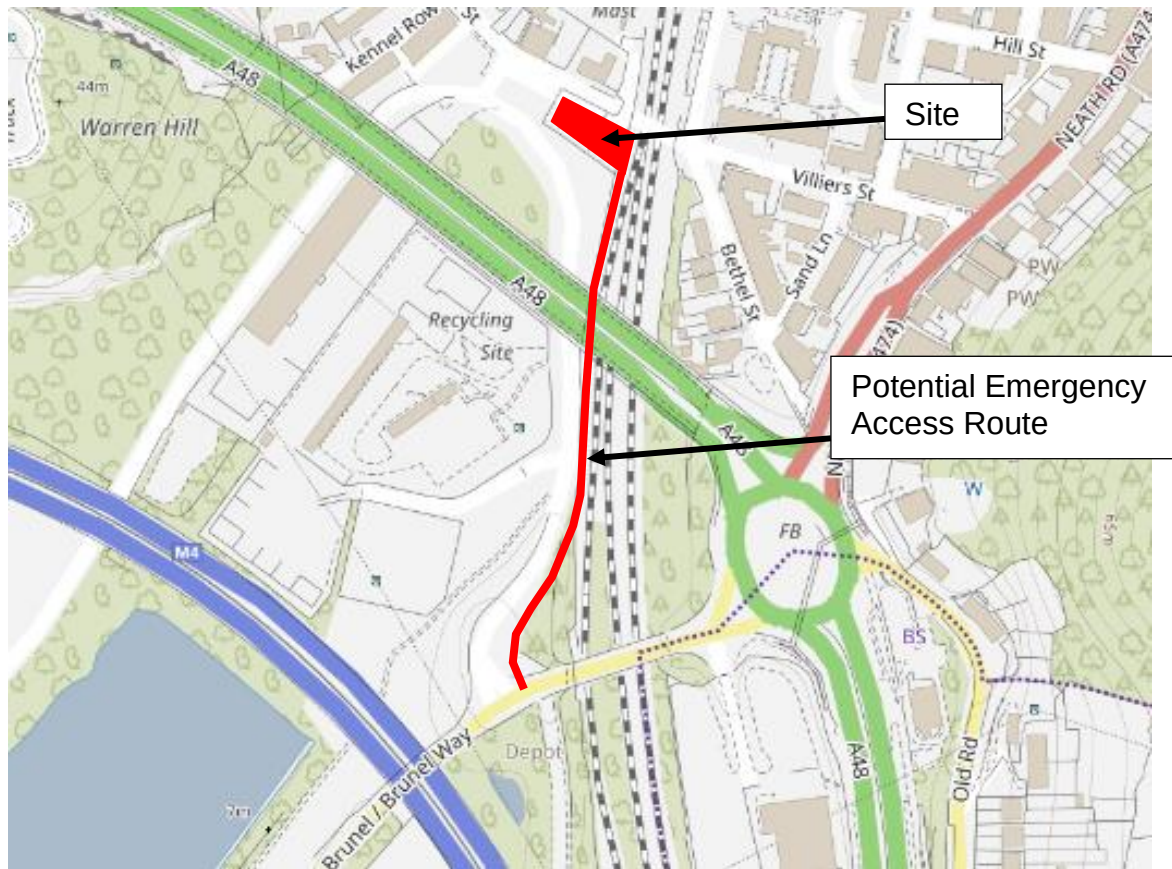


Figure 5.1 – Potential Emergency Evacuation Route

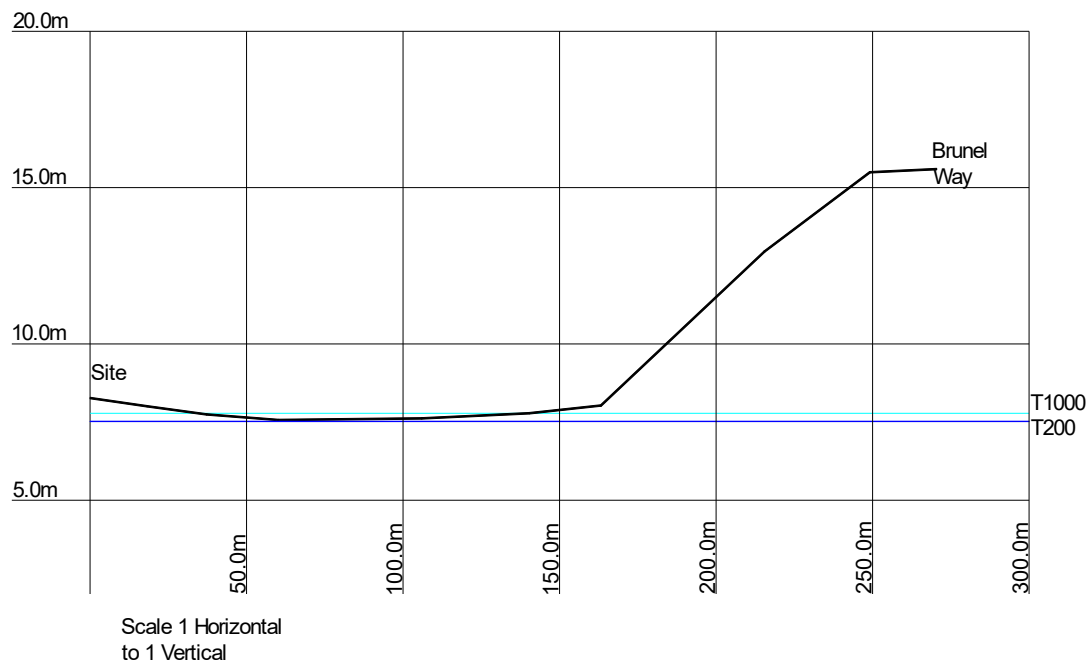


Figure 5.2 – Section Through Evacuation Route From The Site To Brunel Way With 100 Years of Sea Level Rise

Flood response instructions

1 When a flood warning is issued to these premises, please advise the Flood Warden as named below:

Flood Warden _____

Work Hours Tel. _____

Out of Office Tel. _____

2 Ensure all present at the compound are aware that a flood warning has been issued, by Natural Resources Wales.

3 Flood door to the day room to be closed.

4 Prior to evacuating the site, all utilities are to be switched off.

5 In the event of flood water being seen on the highway, in front of the normal access, refuge will be sought in the static caravan until the flood waters have dissipated.

6 Once evacuated, do not re-enter the premises until instructed, by the recognised authority, that it is safe to do so.

7 If necessary, it will be possible to evacuate the site safely during an event by following the emergency access route.

6 CONCLUSIONS AND RECOMMENDATION

Conclusions

The client wishes to retain and develop an existing residential family compound, which will include a day room and a static caravan, located on developed land off Church St., Britton Ferry. Part of the site, however, lies in a Zone 3 flood area, as shown on the Flood Map For Planning, and is considered at risk of flooding during a 1 in 200 year event with 100 years of sea level rise. Francis Sant were, therefore, asked to undertake a Flood Consequence Assessment to evaluate the risk.

It is noted that currently the compound, as shown on the Flood Risk Assessment Map, is not at risk of flooding although the site, that the family has moved from, is at risk of flooding from the sea.

Even with 100 years of climate change the site is not at risk from fluvial or surface water flooding. In addition, the site is also not expected to be at risk from reservoir failure and the risk of ground water flooding is considered to be low.

With 100 years of sea level rise taken into consideration, part of the site could at risk during both the T200 and T1000 events with flood levels of 7.627m AOD and 7.887m AOD respectively. To ensure that the site remains flood free during a T200 event the compound ground levels will need to be raised above this which would also ensure that the flood depths are manageable during a T1000 event. Precautionary, the ground levels could be set at 7.817m AOD (97.5% non exceedance during a T200 event). As the risk of flooding is tidal there will be no measurable impact from the loss of flood storage capacity and no detrimental impact on the risk of flooding to third parties.

The consideration of 100 years of sea level rise assumes a development design life of 100 years. For schemes with a different design period TAN 15 requires the climate change to correspond. Reducing the design period to 50 years would reduce the T200 flood level to 6.932m AOD and the T1000 sea level to 7.192m AOD. This would allow the whole compound, based on current site levels, to remain flood free even during the T1000 event.

Considering the distance to the open coastline the development will not be affected by direct wave action and, as the risk is tidal, a long warning period is expected if it becomes necessary to evacuate the site when considering 100 years of sea level rise. A Flood Response Plan should be prepared to facilitate this. If necessary, a flood free place of refuge is available in the static caravan, even during a T1000 event. If it is required to evacuate during a T1000 event (eg medical emergency) then a manageable access route is available from the site to Brunel Way (see Flood Response Plan). The route is expected to remain flood free during the proposed 50 years planning period.

A sustainable drainage solution, in accordance with the Welsh Government Standards and the SUDS Manual, should be incorporated into the design. SAB approval is also likely to be required which should be confirmed with the local authority.

A summary of the schemes compliance with TAN 15 is provided in Table 6.1.

Table 6.1 – Compliance With Tan15		
Ref	Criteria	
	What Zone does the development lie in?	Main building Zone 1 Remaining Compound Zone 2 and 3
	Vulnerability of the development?	Highly vulnerable
	Is the development located on greenfield or developed land?	Developed Land (Brownfield)
	Is the development flood free during a 1 in 100 fluvial or 1 in 200 tidal events?	Yes
	Is the flood depth less than 600mm during a 1 in 1000 year event?	Yes
	Is the velocity expected to be less than 0.15 for a highly vulnerable development or less than 0.3 for a less vulnerable development during a 1 in 1000 year event?	Yes
	Is there a safe access route?	Yes
	Is the development at risk from costal erosion?	No
	Is the development in a defended zone?	No
	Is there a record of a previous flood event?	No
	What is the flood hazard for the development?	Very Low
	Does the development have a detrimental impact on third parties' risk of flooding?	No

Recommendations

In developing the site, it is recommended that:

- the site ground levels are set above the T200 precautionary level (for a 50 year scheme no changes required) ;
- flood proofing measures, as identified in Section 4, should be considered for inclusion in the scheme;
- consideration should be given for the inclusion of a non return valve on the foul sewer system;
- A sustainable drainage system should be included in the design;
- SAB approval should be applied for if required;
- the site is registered on the flood warning scheme provided by NRW, if available;
- a flood response plan is prepared, maintained and effectively disseminated to all future occupiers of the development.