

Francis Sant

Redevelopment at Rose Cottages, Resolven Flood Consequence Assessment Report

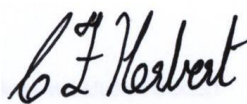


August 2022 Interim

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Signed



Date August 2022

CONTENTS

	Page
1 Introduction	1
2 The Development	3
3 Flood Risk	8
4 Flood Proofing Measures	12
5 Conclusion and Recommendations	14

1 INTRODUCTION

The client proposes to convert an existing garage at Rose Cottage, Resolven, into a two bedroom bungalow. They have been advised, however, that the site lies within a Zone C2 flood area as defined by the development advice maps (see Figure 1.1) referred to in Technical Advice Note 15, Development and Flood Risk (TAN 15). This means that the site could be at risk of flooding during at least the 1 in 1000 year event and is not afforded protection from significant and recognised defences. There are concerns, however, that the DAM maps are not accurate in this area.

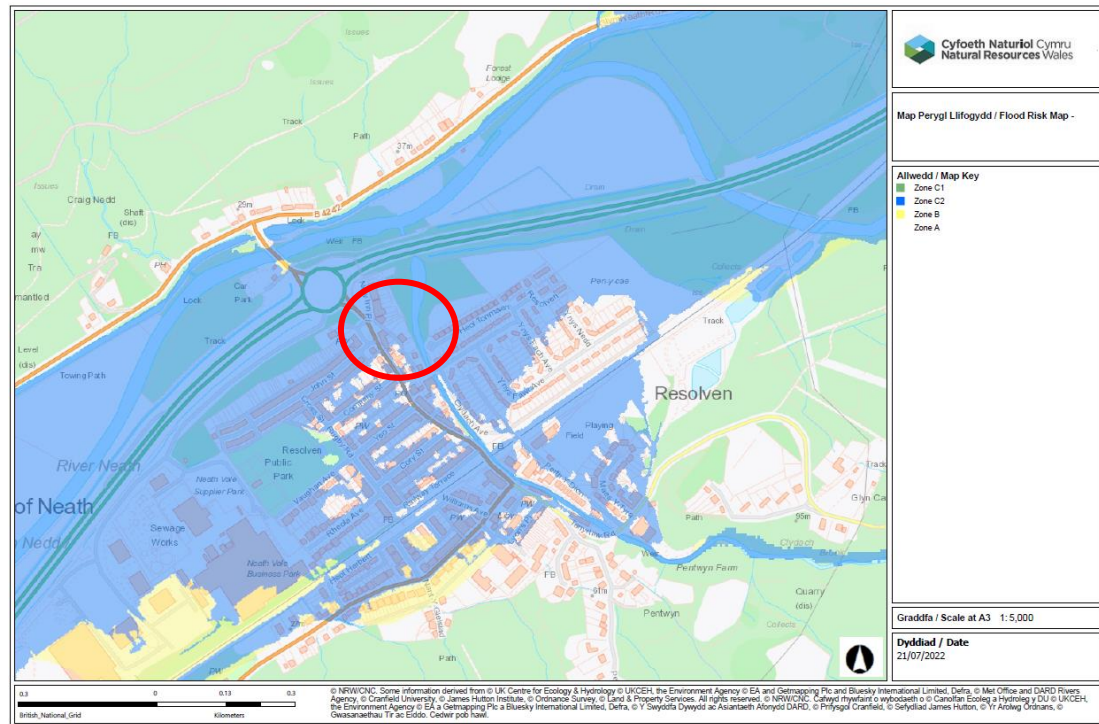


Figure 1.1 - Development Advice Flood Map

The Development Advice Maps are based on Natural Resources Wales Flood Maps (see Figure 1.2) supplemented by sediment data, held by the British Geological Survey (BGS), of historical flooding. 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. It is noted that the newer Flood Risk Assessment Maps shows the site to be flood free during both the Q100 and the Q1000 events and that the land to the west is afforded protection.

Considering the proximity of the site to the Afon Nedd and the Clydach Brook it is possible that the development could be at risk from fluvial flooding, particularly when taking climate change into consideration. As such the client has requested that a Flood Consequence Assessment is prepared to evaluate the risk of flooding. The assessment should be in accordance with the requirements of Section 7 and Appendix 1 of TAN 15. Francis Sant have been employed to undertake this task.

This document summarises the work undertaken as part of the study. Section 2 of the report gives a description of the surrounding area while the risk of flooding from various sources is considered in Section 3. Possible flood proofing measures are discussed in Section 4 and the conclusions and recommendations of the study are provided in Section 5.

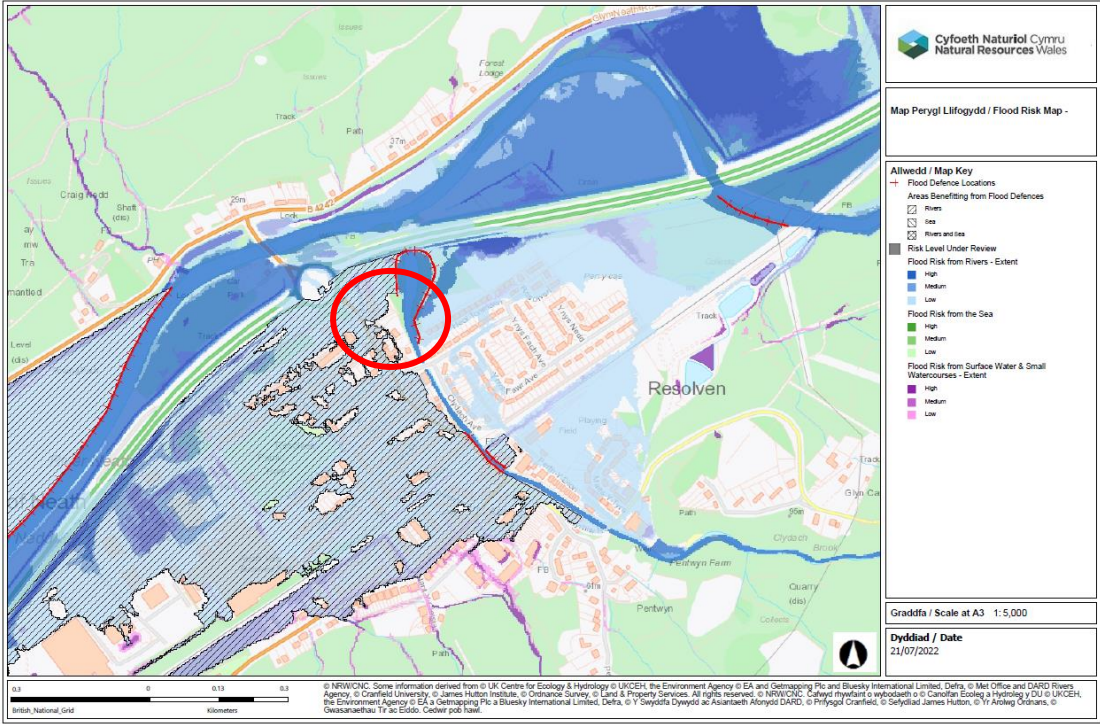


Figure 1.2 – NRW Flood Risk Assessment Map (New)

2 DEVELOPMENT

The Rose Cottage site (coordinates 282860 202950) is located on a minor road off the B4434 Commercial Road, to the north of the village and close to the A465 roundabout (see Figure 2.1 to 2.3 and Plate 2.1). It is some 9km north east of Neath and some 15km south west of Glynneath. Clydach Brook is some 30m to the east of the site while the Nedd is some 165m to the north, beyond the A465 dual carriageway.

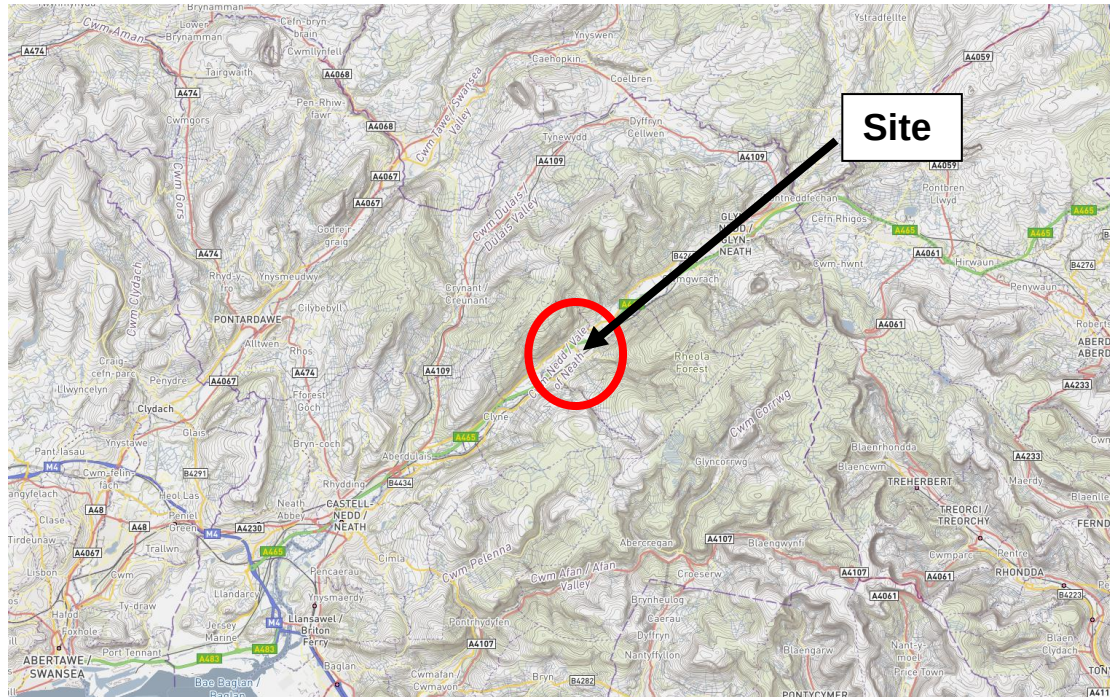


Figure 2.1 – Location Plan

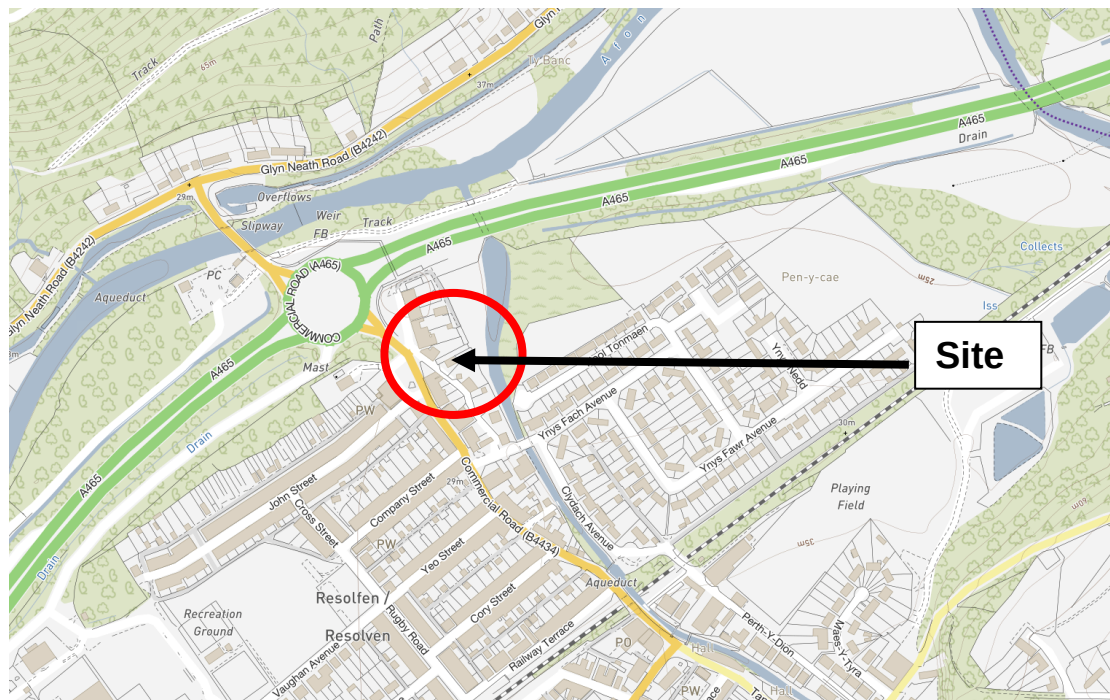


Figure 2.2 – Plan of Area

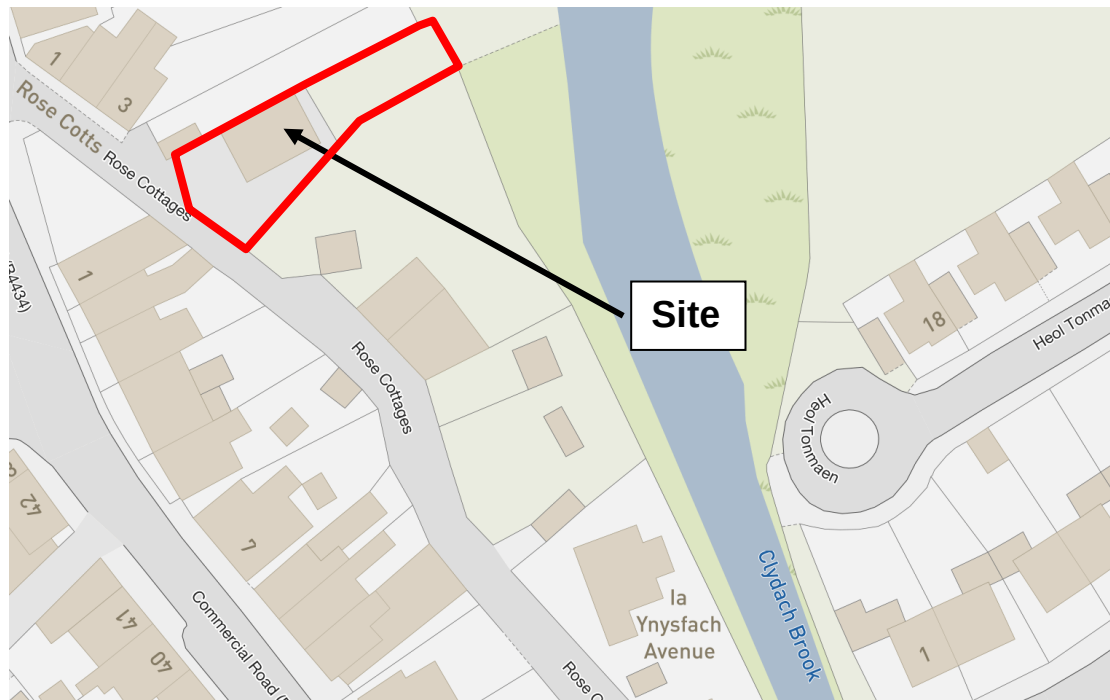


Figure 2.3 – Plan of Site

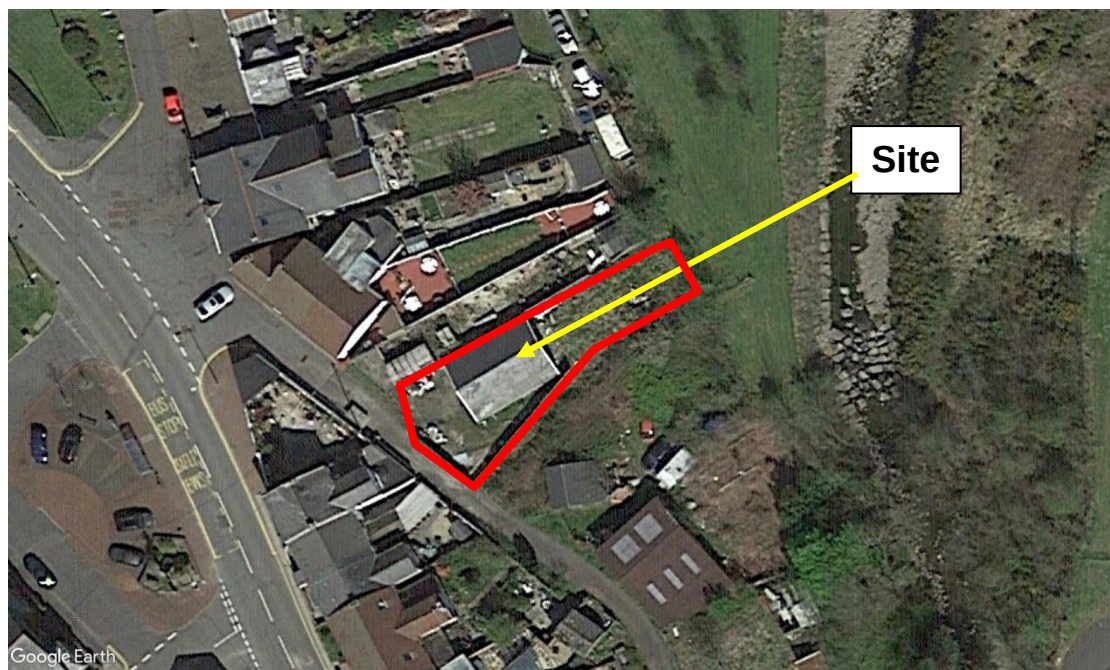


Plate 2.1 – Aerial View of Site

Proposal

It is proposed to convert a large existing garage into a single two bedroom bungalow (see Figure 2.4 to 2.8)

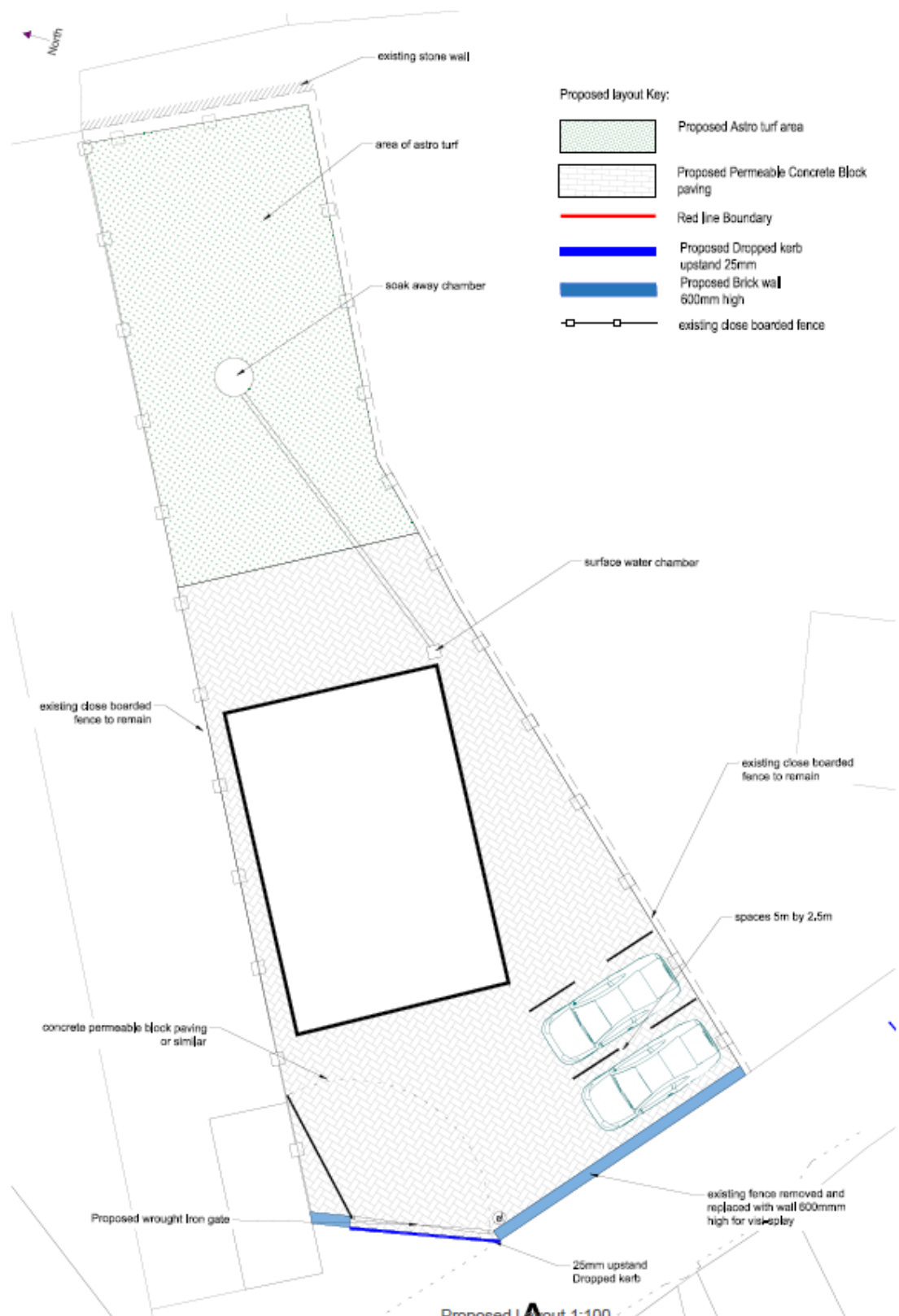


Figure 2.4 – Plan of Proposed Development

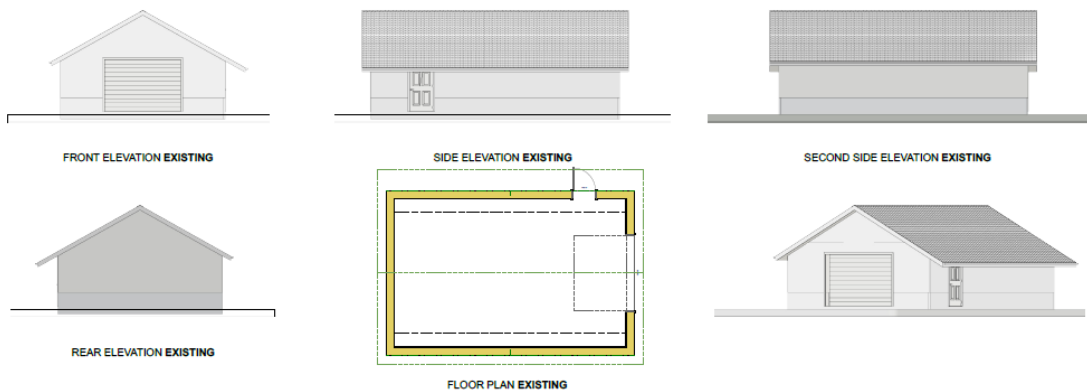


Figure 2.5 – Elevation and Floor Plan of Existing Garage

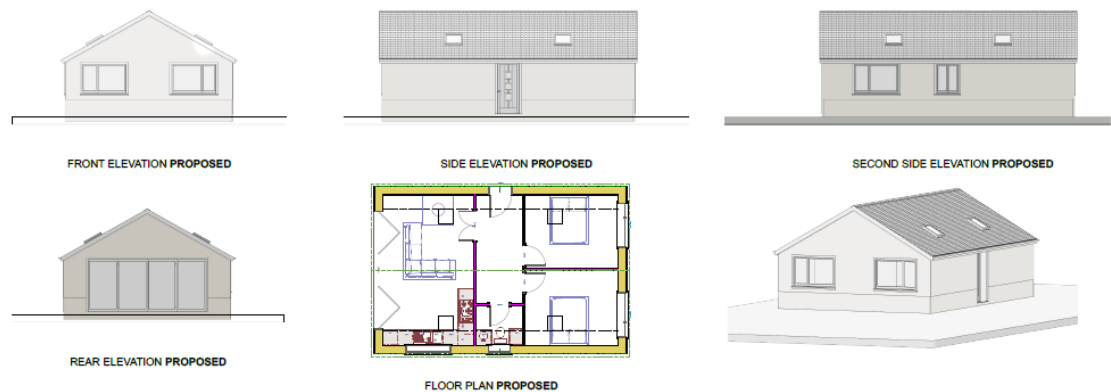


Figure 2.6 – Elevation and Floor Plan of Proposed Bungalow

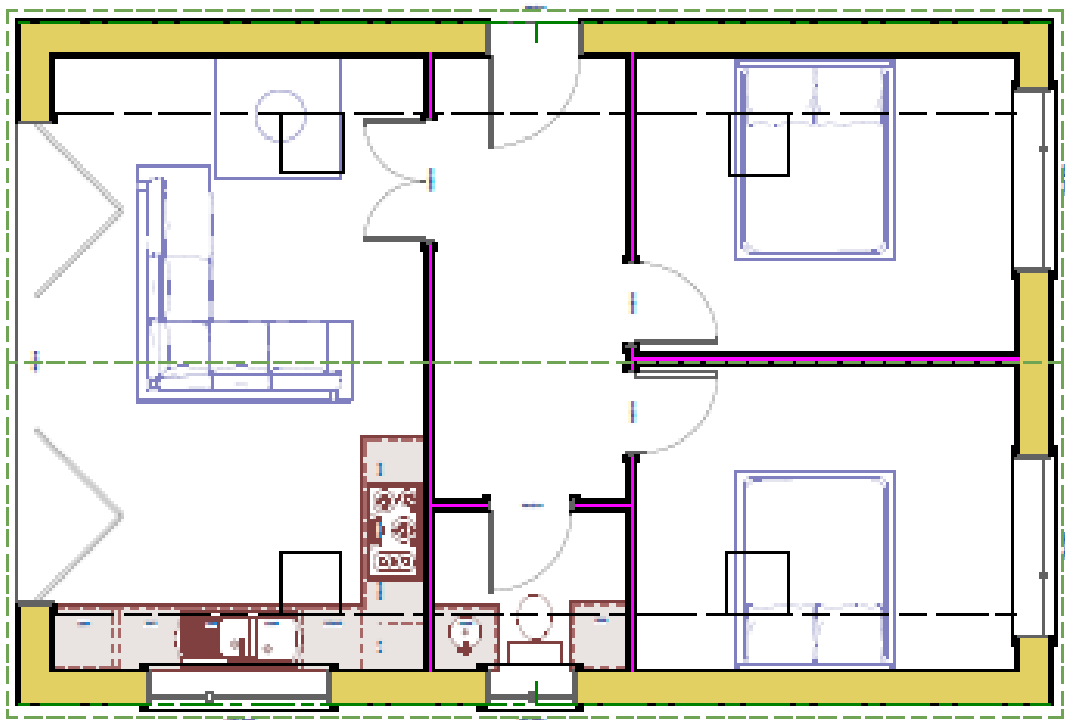


Figure 2.7 –Floor Plan of Proposed Bungalow



Figure 2.8 – View of Proposed Bungalow

Topography

Lidar data (see Figure 2.9) shows that site levels range between 26.8m AOD, near the road, and 28.2m at the rear. The site falls from east to west.

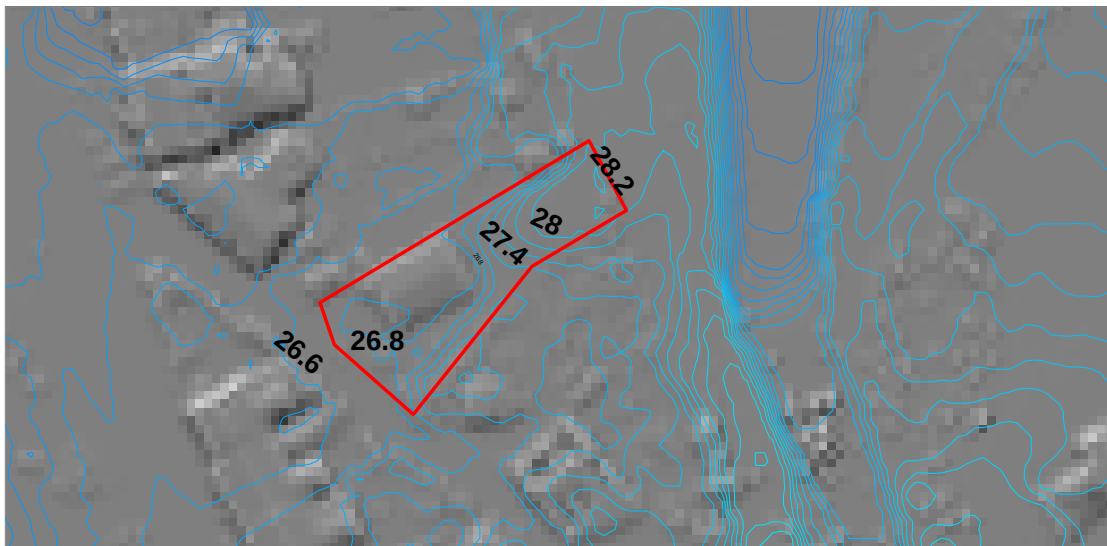


Figure 2.9 – Lidar Data for the Site

3 FLOOD RISK

Flooding can occur from several sources, some of which are considered in this section. The Flood Risk Assessment map (see Figure 3.1), produced by Natural Resources Wales, indicates that the surrounding area potentially could be at risk of fluvial flooding particularly during a Q1000 event although the land to the west is afforded a degree of protection. The site itself, however, is expected to remain flood free during both the Q100 and Q1000 fluvial events. It is noted that the map does not take climate change into consideration.

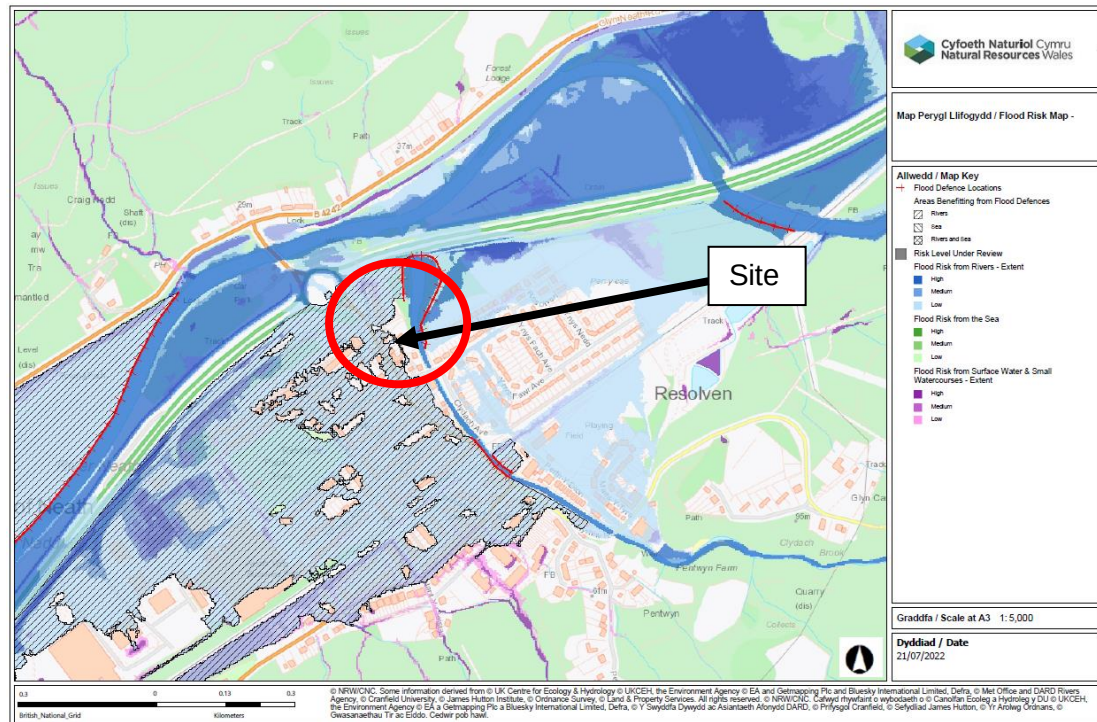


Figure 3.1- NRW Flood Risk Assessment Map

3.1 Fluvial

The NRW's Flood Map For Planning, which allows for climate change, shows that the development is expected to remain flood free during both the Q100 and the Q1000 events. The land to the west, including the B4434 Commercial Road could be affected but is afforded protection from recognised defences, (see Figures 3.2).

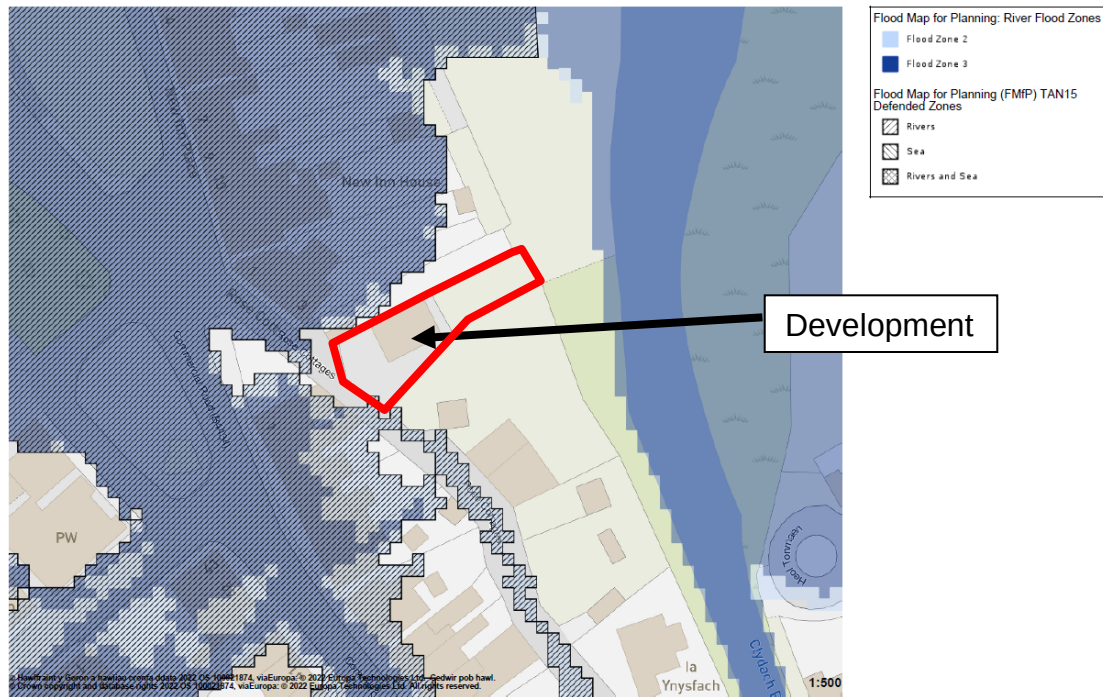


Figure 3.2 – River Flood Map For Planning

3.2 Tidal

The site is not considered at risk from tidal flooding.

3.3 Surface Water and Small Watercourses

The Surface Water and Small Watercourses Flood Map For Planning suggest that the site is not at risk of flooding even during a Q1000 event (see Figure 3.3).

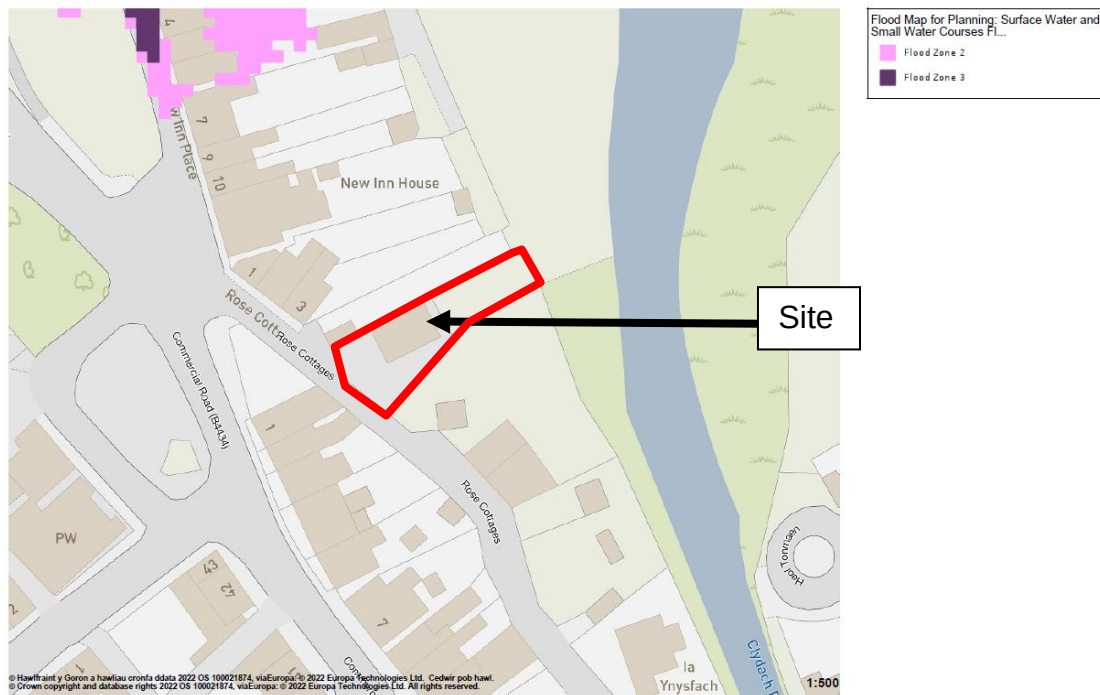


Figure 3.3 – Surface Water Flood Map For Planning

3.4 Sewage Backflow.

Care should be taken to ensure that water from the foul / combined sewer system is unable to back up into the development and consideration should be given to installing a none return valve.

3.5 Sustainable Drainage

As the development is the conversion of an existing building SAB approval is unlikely to be required for the surface water drainage. Nevertheless the drainage system should be designed in accordance with the Welsh Government Standards and the SUDS manual.

3.6 Reservoir Failure

The building is not considered to be at risk from reservoir failure (see Figure 3.4) and the risk of failure is considered to be very low.

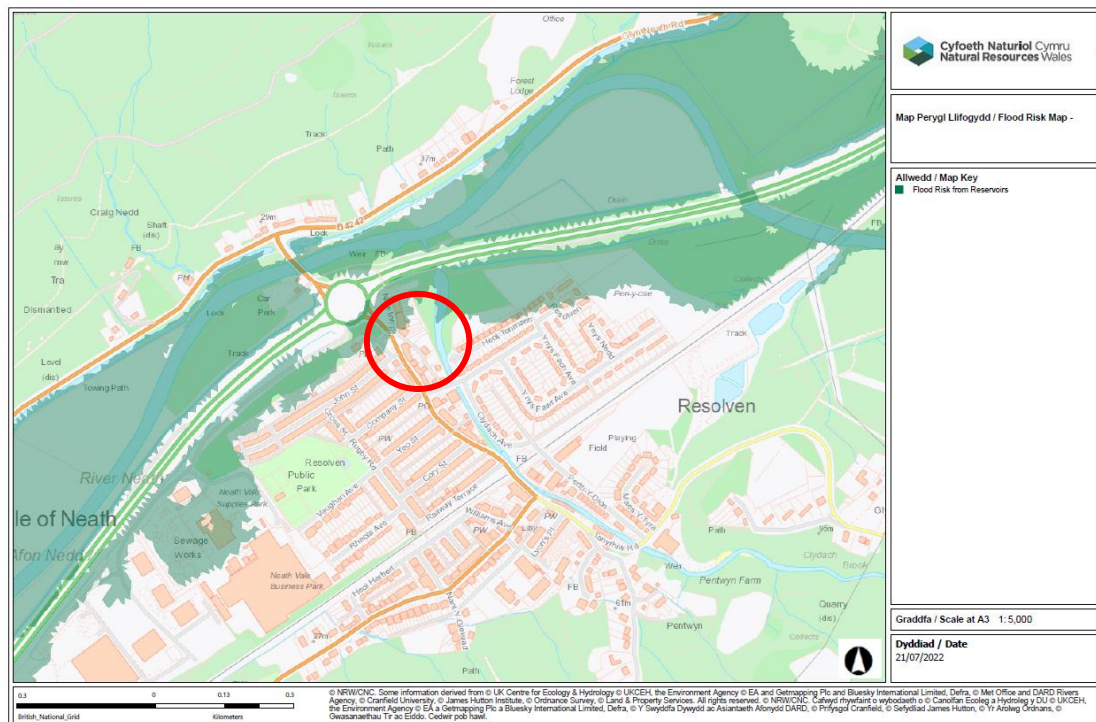


Figure 3.4 – Extent of Flooding From Reservoir Failure

3.7 Ground Water

The superficial geology for the area consists of Sand and Gravel from Alluvial Fan Deposits overlying a bedrock geology of Mudstone Siltstone and Sandstone from the South Wales Middle Coal Measures Formation (see Figure 3.5 and 3.6). When also taking the terrain into account the risk of groundwater flooding is considered to be moderate to high.

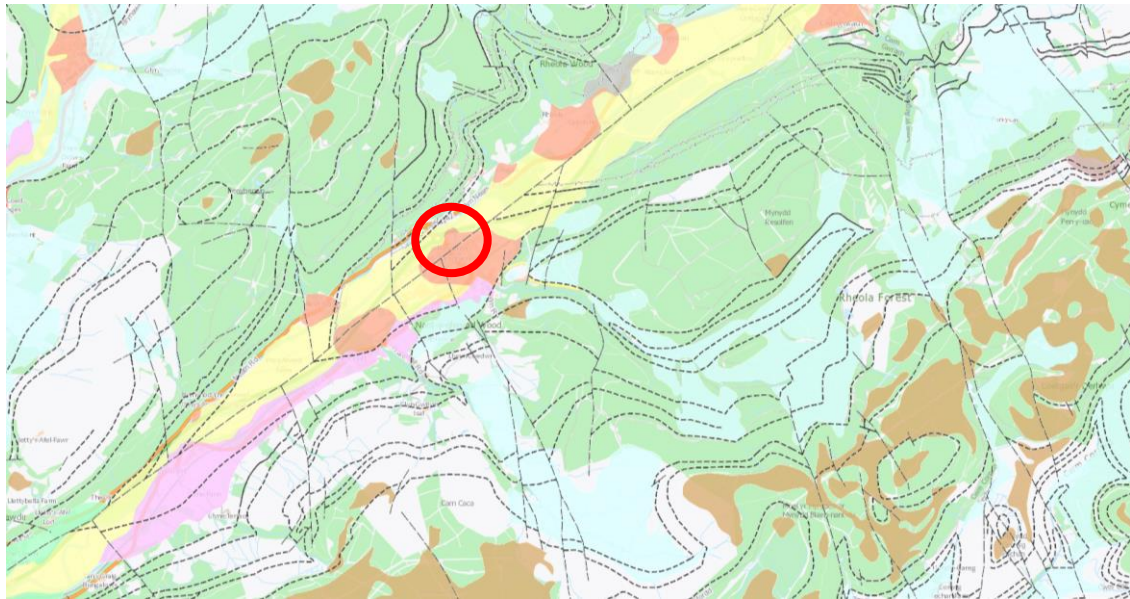


Figure 3.6 – Superficial Geology

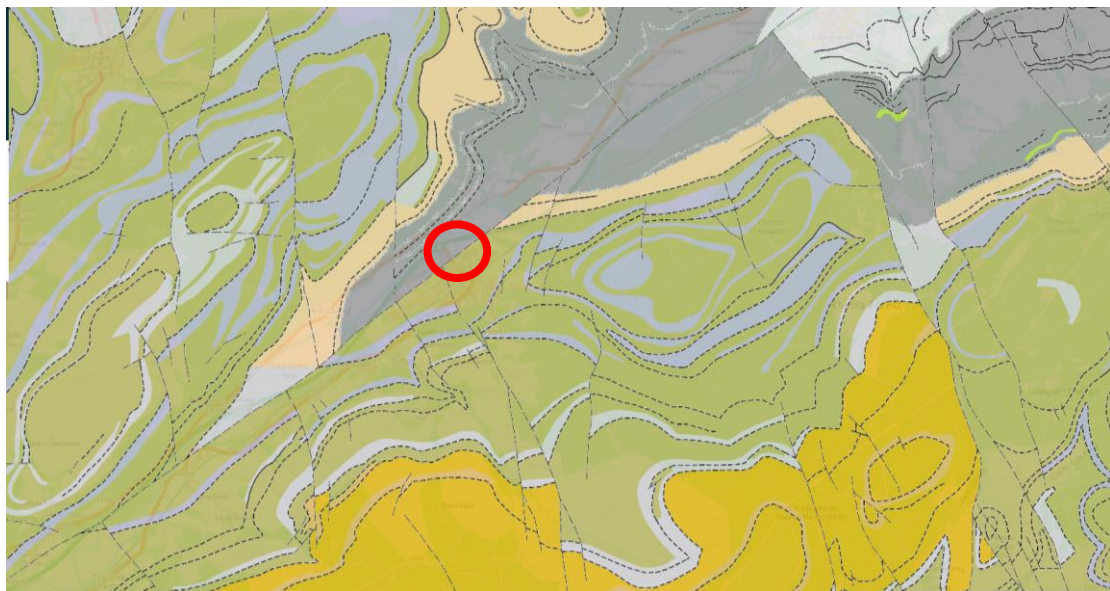


Figure 3.7 – Bedrock Geology

4 FLOOD PROOF MEASURES

Section 3 indicates that the development is expected to remain flood free from the considered events, however, the risk can not be dismissed altogether. Flooding can result in the need for expensive repairs. As well as the direct damage caused to the building, flooding can impact in many other, and possibly more stressful, ways. The inconvenience of cleaning up a home and the loss sentimental belongings, can be immeasurable. There are methods, however, to limit and mitigate against the consequence of flood damage. Some of these are discussed in this section and should be considered as part of the development where applicable.

Water can enter a building:

- Around the edges of closed doors;
- Through airbricks;
- Backflow through overloaded sewers;
- Seepage through walls especially cracks;
- Seepage through the ground;
- Around cable / services entrance into the building.

Dryproofing - Preventing the water from entering the building.

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

- There are several propriety barriers available, however, these can be expensive. If desirable, it might be possible to ensure that the walls of the building are able to act as a barrier themselves. Care should be taken to ensure that the pointing and any external plastering are kept in good order and that all cracks and gaps around cables and ducts entering the building are sealed;
- Providing temporary covers to any low air vents. These covers should be removed once the risk of flooding is over;
- Erecting a temporary barrier in front of any external doors or installing flood protection doors;
- Installing a valve allowing the sewer system to be shut preventing any back flow.

In this instance, as the risk of flooding is low, extensive dry proofing measures are not considered necessary.

Wetproofing – Limiting the damage once water has entered a building.

It may not be practical to eliminate the risk of flooding, however, it is possible to limit the damage that 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. Suspended floors are more difficult to clean and dry underneath;
- Have tiled floors or removable rugs in place of fitted carpets;
- Use water resistant plaster for the walls;
- Ceramic tiles can be used for wall coverings especially in the kitchen and bathroom;
- Use non water absorbing insulation;
- Use corrosion resistant fittings such as galvanised or stainless steel;
- Ensure that the electric cables are fed from above and the sockets kept high;
- Use an appropriate damp proof course;

- Avoid timber frame construction for internal walls;
- Consider freestanding movable equipment;
- Install any equipment with motors high up from the floor;
- Install solid internal and external doors effectively sealed;
- Avoid storage heaters;
- Ensure boilers are off the ground.

Considering the risk of flooding to the surrounding area a flood response plan could be prepared and regularly maintained. All future occupiers would then be made aware of the flood risk and what actions are to be undertaken during an event. 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.

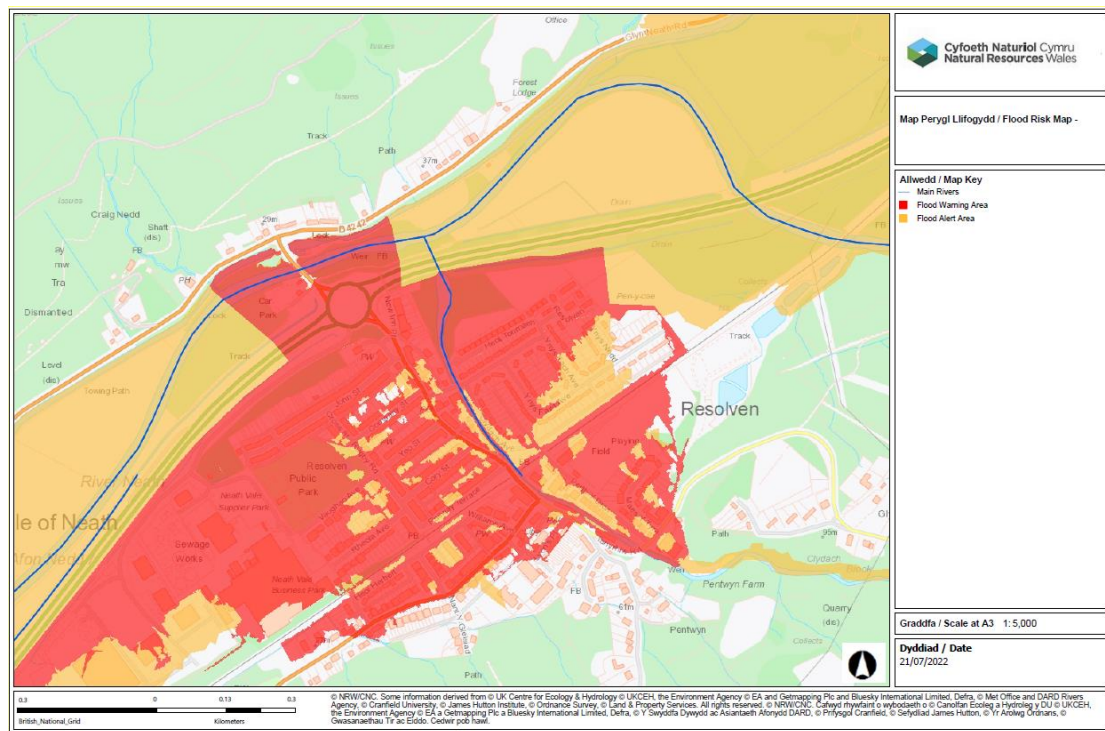


Figure 4.1 – NRW Flood Warning Area

5 CONCLUSION AND RECOMMENDATIONS

The client wishes to convert an existing garage at Rose Cottages Resolven into a two bedroom bungalow. Although the site currently lies in a C2 flood zone, in accordance with TAN 15, there are concerns regarding the accuracy of the maps. It is also understood that the DAM maps will be superseded in June 2023 by the Flood Maps For Planning. The risk of flooding was, therefore, further assessed.

The River Flood Maps For Planning would suggest that the site is expected to remain flood free even during a Q1000 event. While the land to the west, including part of the access route, could be at risk there are defences in place providing protection. The site is also not affected by surface water flooding, tidal flooding or from reservoir failure although the risk of ground water flooding is considered to be medium to high.

As the building already exists SAB approval may not be required although the surface water should be drained in accordance with the Welsh Government Standards and the Suds Manual.

Although protected, part of the access route from the site could be at risk and it may be prudent to prepare a flood response plan as a precaution.

Recommendations

In refurbishing the building, it is recommended that:

- Floodproofing measures, as identified in Section 4, are included in the development where necessary.
- A non return valve is installed on the foul sewer system;
- An emergency evacuation plan is prepared, maintained and effectively disseminated to all future occupiers.
- If available the development is registered on the flood warning scheme provided by NRW.