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THE ENTERPRISE CENTRE,
MERTHYR INDUSTRIAL PARK,
PENTREBACH,
MERTHYR TYDFIL,
SOUTH WALES,
CF48 4DR.

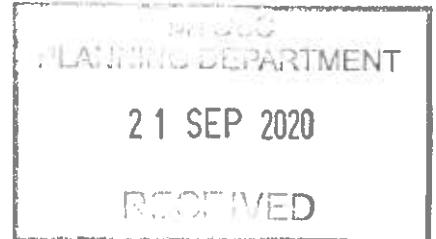
BLANDFORD CONSULTING

Geologists Working With The Environment....

**Mr and Mrs G Williams,
Yr Hendy Stordy,
Ladysmith Place,
Troedyrhiw,
Merthyr Tydfil, CF48 4JH.**

Our Ref: BC/MB/02.20.09.

Date: 7th July 2020.



Dear Mr and Mrs Williams,

**Re: Flood Consequence Assessment, Rear 9/10 Archer Street, Troedyrhiw,
Merthyr Tydfil, CF48 4JQ.**

At your instruction we have carried out a Flood Consequence Assessment for the proposed redevelopment at the above address, the location of which is shown on the Detailed Location Plan, Figure 1. The detached property at the rear of 9/10 Archer Street, Troedyrhiw in Merthyr Tydfil (the Site), is located within a mixed residential area. The Site is comprised of a detached building last used for commercial purposes on the ground floor and with a self-contained apartment on the first floor. The ground floor is presently not used, and the proposed redevelopment would bring the building back into full beneficial use and avoid it deteriorating to become an eyesore. The re-arrangement will extend the domestic occupation to the ground floor. There is to be no sleeping accommodation in the ground floor. The proposed redevelopment is defined by Figure 2 of TAN15: Development and Flood Risk, the Welsh Assembly Government's planning advice relating to proposed developments in areas at risk of flooding as 'highly vulnerable'. The accommodation on the first floor already results in the use of the building being classified as 'highly vulnerable'.

A walkover survey of the Site collected measurements on the height of the ground floor relative to the outside area. Blandford Consulting has been commissioned to carry out the FCA. Natural Resources Wales (NRW) were consulted and provided flood data and flood plans relevant to the property, *reference no. AT-19069a*. This report contains information that is NRW copyright and/or data protected. The flood levels are shown in Table 1 and 2 and the outline of the areas predicted to be at risk of flooding in Figures 2, 6 and 7. The information provided by NRW identifies that the Site was flooded during the major flood in December in 1979 (see Figure 3).

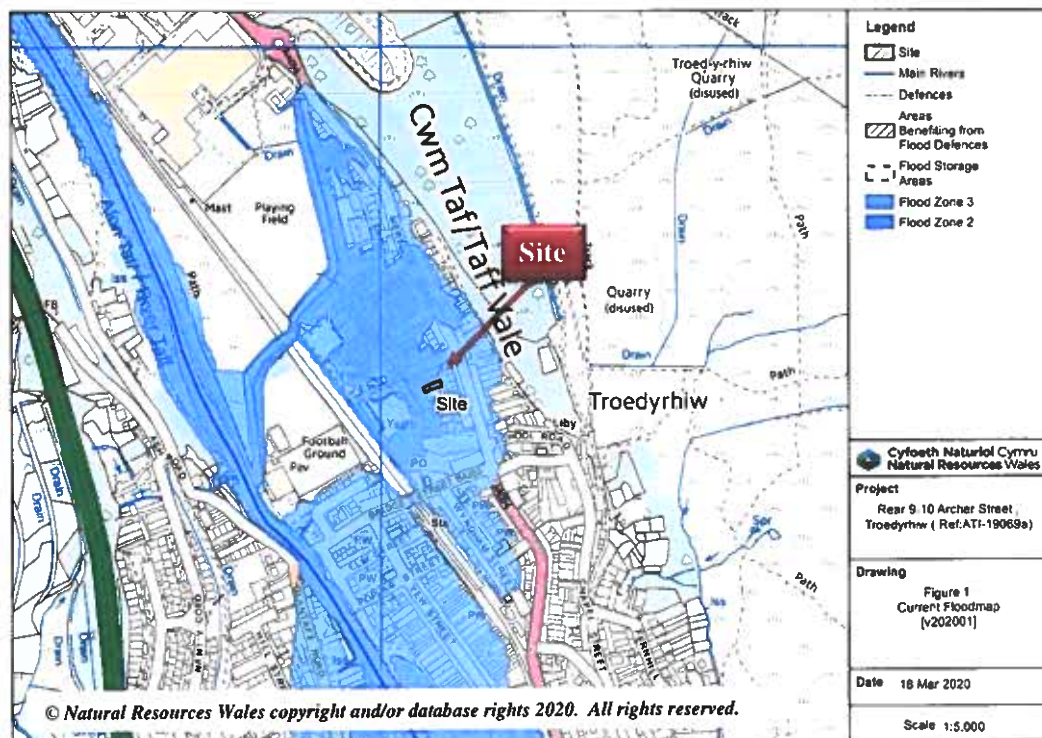
The data supplied by NRW is taken from the Merthyr to Merthyr Vale Velocity Depth Mapping undertaken by Mott MacDonald in September 2010. This study uses a 1D/2D linked ISIS-TUFLOW hydraulic model using LiDAR DTM base and ReFEH methodology.

The property lies within Zone C2 as defined by the development advice map (DAM) referred to in TAN15. The 'highly vulnerable' classification for the proposed development means that it should be permitted in the C2 zone only after the application by the Local Planning Authority of a justification test. The justification test should include that users will be aware of the flood risk, that there is an acceptance of the consequences, that escape/evacuation routes are present, that there are flood/emergency plans and that there is no increased risk of flooding elsewhere from the development.

**Figure 1
Detailed Location Plan.**



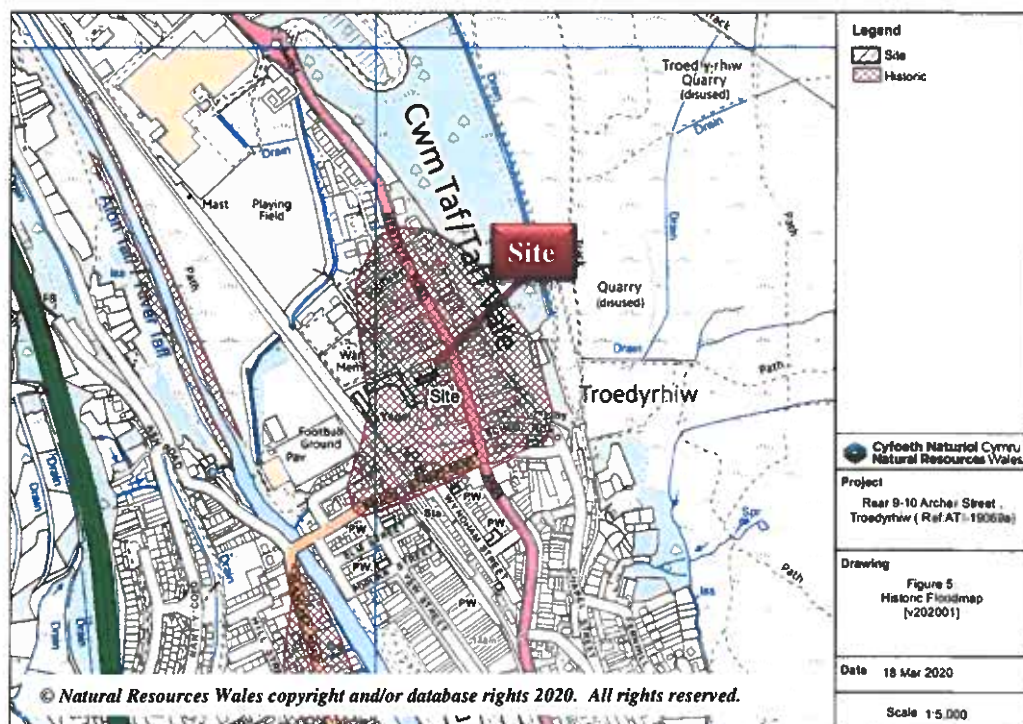
**Figure 2
Current Flood Map.**
(Supplied by NRW, ref AT-19069a, Created 18th March 2020)



The Site benefits does not benefit from any flood defences in respect of the River Taff. The basic flood consequence assessment map for the locality produced by NRW (Figure 2) shows the Site to straddle Flood Zones 2 and 3, with the building and evacuation route in Flood Zone 2 and the rear garden area in Flood Zone 3. The Site does not lie within the 20m buffer zone applying to main rivers.

The information provided by Natural Resources Wales indicates that the Site was flooded in the major flood of December 1979 (see Figure 3). In the area that includes the southern part of Merthyr Town, Pentrebach and the northern part of Troedryhiw former mine workings for coal and ironstone are drained via a complex series of integrated underground water courses and surface drains; the system discharges into the River Taff near Bridge Street in Troedryhiw. On a number of occasions, the system has caused flooding across areas of Pentrebach and Troedryhiw, including in December 1979, as a result of blockages and/or excessive rainfall. Allott and Lomax (Consulting Engineers) were commissioned by Merthyr Tydfil Borough Council to review the drainage system and provide proposals to make improvements to it in order to avoid flooding occurring. Allott and Lomax reported in January 2000 and works were subsequently carried out to improve the drainage system to avoid further flooding taking place. The various flood events that affected parts of Pentrebach and Troedryhiw resulted from problems with the drainage system and were not the result of the River Taff overflowing its banks.

Figure 3
Historic Floodmap (v4).
(Supplied by NRW, ref AT-19069a, Created 18th March 2020)



The NRW's information based on the Mott MacDonald study identifies that at the time of the study (2010) the Site was not at risk of flooding in flood events with a return period up to 1 in 75 years (defended) and then up to a depth of up to 0.26m in the 1 in 100-year flood, 0.39m in the 1 in 100-year+CC flood, and 1.66m in the 1 in 1,000 year flood. In the undefended scenarios the study predicted the Site to flood to up to a depth of 0.34m in the 1 in 100-year flood and 1.66m in the 1 in 1,000-year flood (see Table 1).

The 1 in 100-year+CC flood map provided by NRW shows the predicted flooding to occur in the rear garden area the building and the evacuation route to the east are both predicted to be flood-free (see Figure 4). During the walkover survey carried out at the Site the difference of elevation between the internal floor level and the rear garden was measured; the internal floor was found to be 335mm higher than the rear garden (see Photoplate 1). The rear garden slopes gently westwards, towards the River Taff, and is at its highest elevation immediately adjacent to the rear of the building.

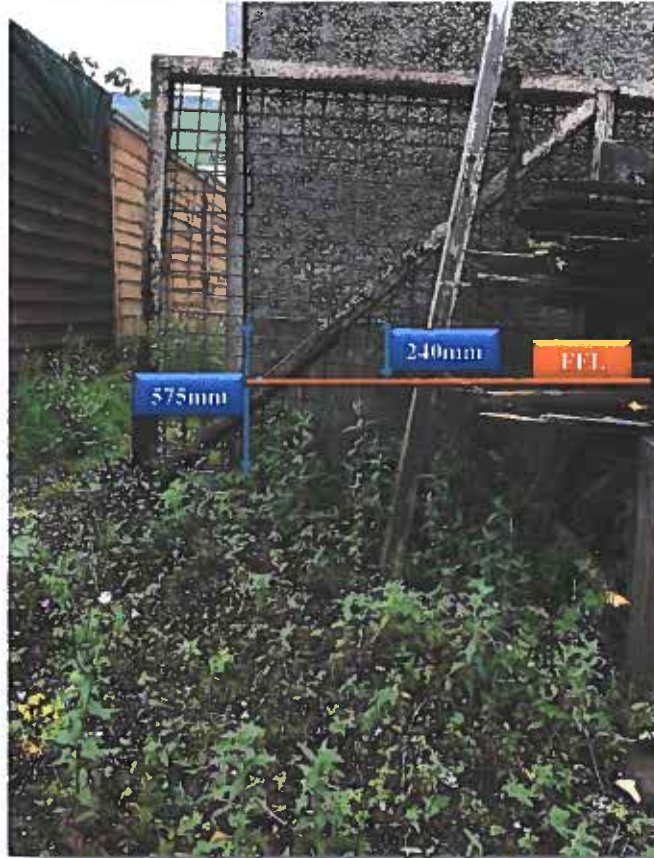
Table 1
NRW Flood Level Data
(Supplied by NRW, ref AT-19069a, Created 18th March 2020)

<i>Flood Return Period</i>	Undefended		Defended					
	<i>1 in 100</i>	<i>1 in 1,000</i>	<i>1 in 50</i>	<i>1 in 75</i>	<i>1 in 100</i>	<i>1 in 100 CCc</i>	<i>1 in 200</i>	<i>1 in 1,000</i>
Model Grid Size (m)	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Wet Cells	3	37	0	10	20	20	47	47
Elevation, mean (m aod)	138.75	140.07	Null	138.675	138.80	138.87	139.09	140.07
Elevation, max (m aod)	138.75	140.07		138.675	138.80	138.87	139.09	140.07
Flood Depth, mean (m)	0.20	1.28		0.15	0.20	0.26	0.30	1.28
Flood Depth, max (m aod)	0.34	1.66		0.26	0.39	0.39	0.68	1.66
Flood Velocity, mean (m/s)	0.07	0.14		0.07	0.07	0.07	0.06	0.14
Flood Velocity, max (m/s)	0.22	0.29		0.20	0.24	0.24	0.26	0.31

The TAN15 document provides guidance that a development categorised as 'highly vulnerable' should be flood free during a 1% fluvial flood or 0.5% tidal flood. It can be seen from Table 1 that the mean flood depth is predicted to be 150mm and therefore lower than the current finished floor level inside the building; the maximum predicted flood depth would apply to the lowest part of the curtilage, the western extremity of the rear garden, distant from the building. The building is predicted to remain flood free during this flood event. The entrance to the building is presently on the side elevation, near the front where the land is at its highest elevation. It is proposed to keep the entrance in the same position (see Photoplate 2).

The building is also predicted to be flood free during the 1 in 100-year + CCc event when the mean flood depth is predicted to be 260mm and therefore lower than the FFL. Based on the prediction of the mean flood depth the ground floor would be inundated to a depth of 930mm in the event of an extreme flood (1 in 1,000-year return period) (see Figure 5).

Photoplate 1
Rear Garden Adjacent to Building.

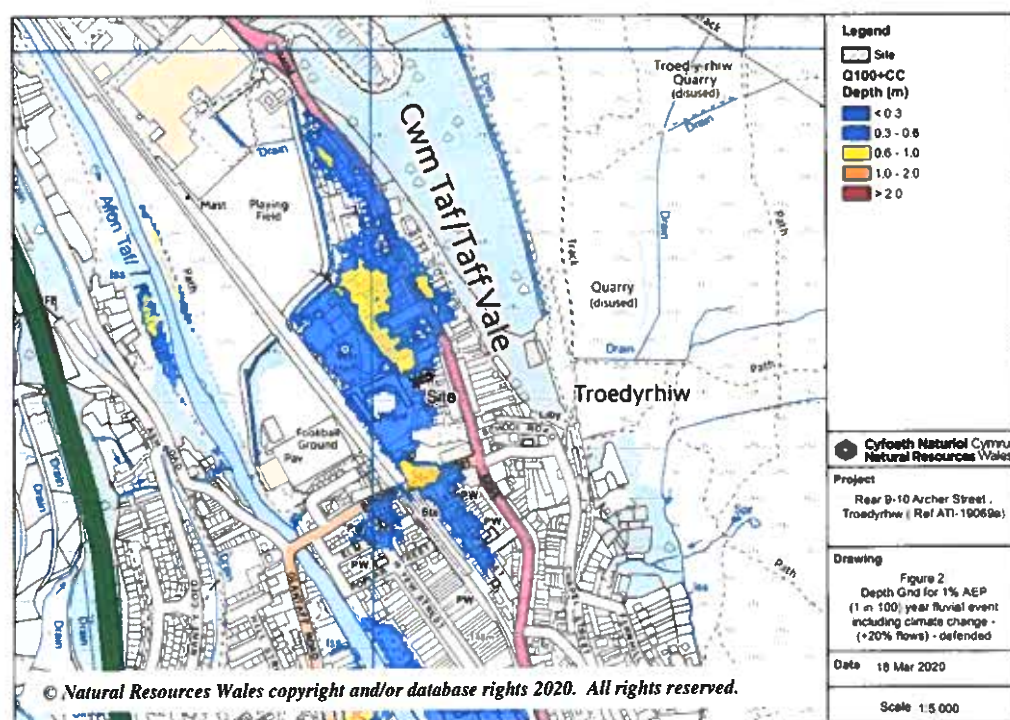


Photoplate 2
Main Entrance to the Building.



NRW's online flood map shows that there is a low risk of surface water flooding on the two sides and the rear of the building, but not at the front (see Figure 6).

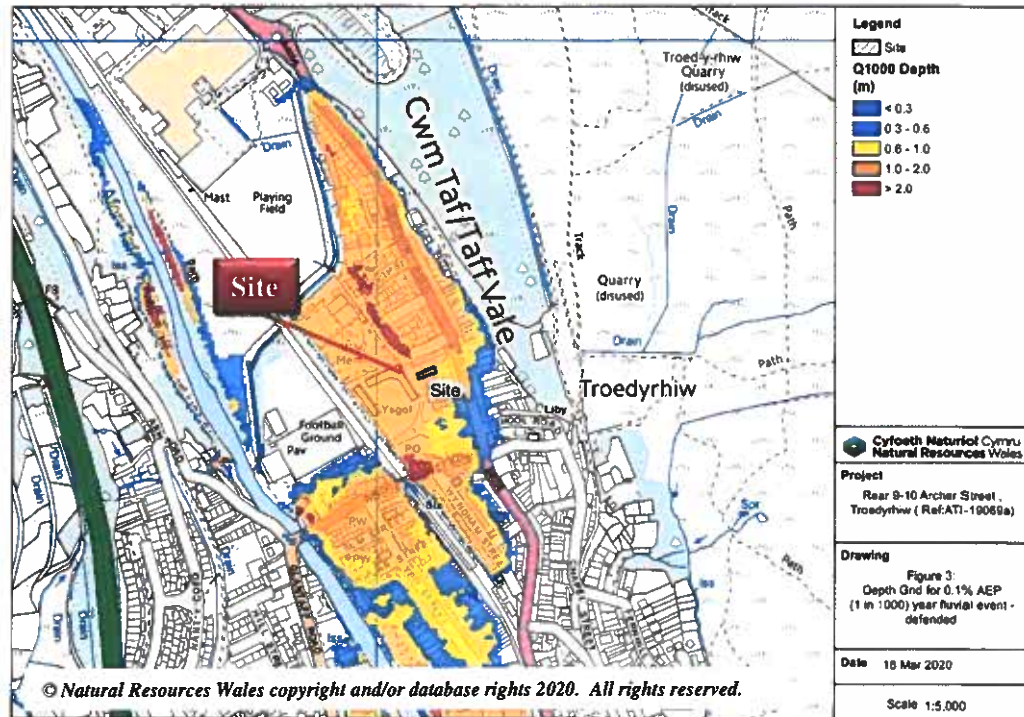
Figure 4
Depth Grid for 1 in 100 Year + Climate Change +20% Flood Event.
 (Supplied by NRW, ref AT-19069a, Created 18th March 2020)



In the event of any flood event, where evacuation is appropriate it should be southwards along the rear lane leading toward Phyllis Street and towards the centre of the village. During the 1 in 100-year+CCc flood this evacuation route is predicted to remain flood free. In the case of the 1 in 1,000-year flood event the evacuation route is predicted to flood to a depth of between 600mm and 1,000mm immediately outside the property, diminishing southwards. Land predicted to be flood free could be reached by travelling south to Phyllis Street, a distance of only 44m.

The proposed redevelopment of the building will not result in a reclassification of its vulnerability, it is presently 'highly vulnerable' as a result of the first-floor accommodation. In converting the ground floor from a commercial to a residential use there is no proposal to include any sleeping accommodation on the ground floor, all the sleeping accommodation will be on the first floor. The proposed redevelopment is a reorganisation of the internal layout of the property and does not involve any increase in the footprint of the property; consequently, it does not increase the flood risk to third parties. The proposed redevelopment will bring into beneficial use a building that will otherwise become dilapidated and perhaps vandalised and become an eyesore, and will contribute to the Local Authority's housing targets as a windfall site.

Figure 5
Depth Grid for 1 in 1,000 Flood Event.
 (Supplied by NRW, ref AT-19069a, Created 18th March 2020)



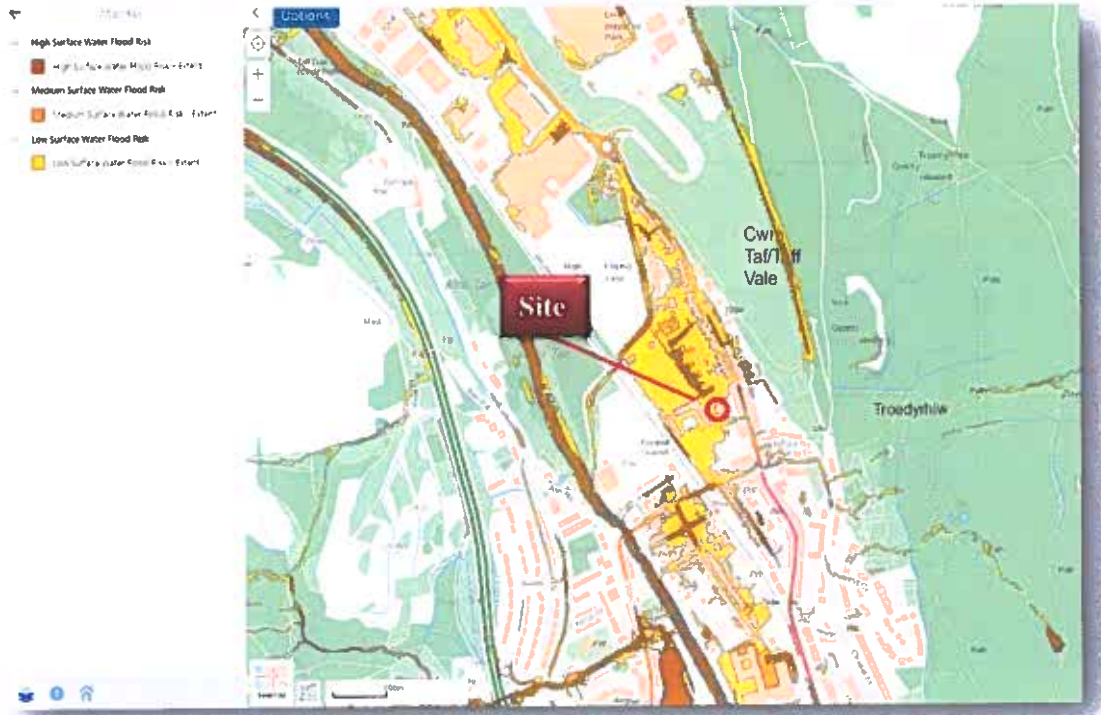
To reduce as far as is practicable the effects of flooding and, where possible, to maximise flood resilience the following steps will be taken.

- All occupiers and/or purchasers will be made aware of the flood risk by having included in their deeds/lease a copy of this flood consequence assessment.
- Residents at the property will register on the NRW's free flood warning line.
- In the event that a flood warning was to be received, either from the NRW or any other source, the occupants will promptly vacate the buildings and travel southwards towards Phyllis Street, where land predicted to be free of flooding could be accessed after a short distance of approximately 44m along a lane that can be perambulated with ease.
- If evacuation is impractical residents should remain indoors until the flood abates; safe refuge will be available on the first floor.

Flood resilience measures should be incorporated including,

- water resistant wall finishes up to a height of 950mm;

Figure 6
Surface Water Flooding
(NRW On-line Flood Map, Accessed 7th July 2020)



- water resistant floor finish on the ground floor;
- main services into the building set at a minimum height of 950mm above the FFL;
- secondary service points on the ground floor set a minimum of 950mm above FFL where possible and where it does not conflict with other guidance or legislation;
- non-return valves fitted on all water and sewage outlets;
- water barriers on openings on the ground floor up to a height of 950mm above FFL.

An extreme event flood (1 in 1,000-year return period) capable of inundating this building would be one that would affect a large tract of the Taff Valley and of Merthyr Tydfil and would impose a significant strain on the emergency services. The planned conversion would not materially increase the strain on the emergency services because the building already has accommodation. However, in such an event, residents of the converted property would be able to take refuge on the first floor, minimising the increased workload on the emergency services during such a widespread flood. The additional strain on emergency services would be limited to occupants who find themselves in specific distress, e.g. a medical emergency.

The suitability of the conversion, its contribution to the Council's housing policy, the avoidance of it becoming an eyesore within a residential area, and any additional workload that it might impose on emergency services during a widespread extreme flood event across Merthyr Tydfil are all matters of judgement for the Local Authority.

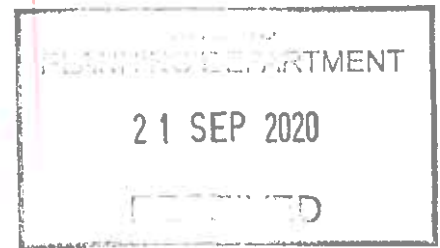
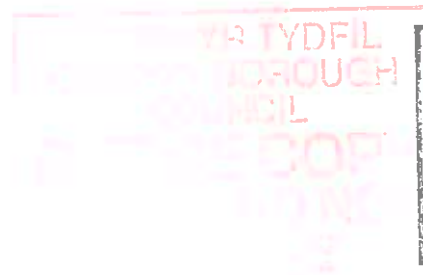
Yours sincerely,

A handwritten signature in black ink, appearing to read 'Dr M Blandford', written in a cursive style.

**Dr Malcolm Blandford,
Chartered Geologist.**

Development Notes

Proposed Development at:
Flat Yr Hen Stordy
Ladysmith Place
Merthyr Tydfil
CF48 4JH



Proposal

To redevelop the ground floor which currently contains a shop, WC and access to the first floor flat as well as the first floor residential flat into a 2-bedroom house with parking bay to the front area.

History

This building along with the adjoining residential unit was previously part of a commercial premises used as a builders merchant.

Between the late 1980's and early 1990's the building was split and the south side redeveloped into a residential unit (as is present) and the north side ground floor remained as a commercial premise with the first floor used as a residential flat with access through the north elevation pedestrian access door.

The ground floor has since remained unoccupied.

Whilst I am advised by Mr Keith Powney (the former owner) that the first-floor residential flat was in occupancy between 1987 and 2009.

Existing Layout

The Existing layout given on drawing reference YHS:PL:01 Revision B indicates the vehicle rights of passage as granted to the neighbour based on geometric characteristics of typical private car turning through 90 degrees. These have been tested in practice with the present neighbour at 9 Archer Street to ensure their rights are maintained.

The rights of vehicle access of the neighbour at 8 Archer Street is not affected by the proposed car parking space.

Flood Consequence Assessment

A flood consequence assessment has been undertaken and a report produced by Blandford Consulting. A copy of the report has been provided as part of the Planning Application.

Flood Defence

In order to provide an additional defence to the ground floor area it is proposed that a proprietary floodgate is installed to the north and west entrance door openings to provide additional protection up to a height of 1m above the existing ground floor.

