



Flood Consequence Assessment for Planning

Prepared for:
Avalon Homes Ltd

March 2021

Our reference:
90364-DavisonWood-QueensTrrc

Location:
9 Queens Terrace
Troedyrhiw
Merthyr Tydfil
CF48 4ER



Document Issue Record

Project: Flood Consequence Assessment for Planning
Client: Avalon Homes Ltd
Location: 9 Queens Terrace, Troedyrhiw, Merthyr Tydfil CF48 4ER.
Application: Conversion of house to two self-contained flats
Our reference: 90364-DavisonWood-QueensTrrc
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Key Facts

Flood Risk Posed:

- Flood Zone C2 as defined by Natural Resource Wales (NRW).
- Risk of pluvial, groundwater and sewer surcharge flooding would appear to be low.
- Site entirely outside modelled 1:100 year and 1:1000 year defended and undefended extent at the present day.
- Site entirely outside of the modelled 1:100 year extent with allowance for climate change.

Flood Risk Management:

- Proposal is for the change of use of the existing building.
- "Highly vulnerable" development throughout (residential properties).
- Flood proofing of the building will be incorporated as appropriate.
- A flood warning and evacuation plan will be implemented post development.

Assuming accordance with these flood risk management measures, Unda Consulting Limited consider the proposed application to be suitable in flood risk terms.

Introduction

Unda Consulting Limited have been appointed Avalon Homes Ltd (hereinafter referred to as “the applicant”) to undertake a Site Specific Flood Consequence Assessment (FCA) for Planning at land to the rear of 9 Queens Terrace, Troedyrhiw, Merthyr Tydfil CF48 4ER.. (hereinafter referred to as “the site”). The FCA has been undertaken in accordance with Technical Advice Note 15 (TAN 15) and the associated technical guidance.

The site appears to be located within Flood Zone C2 as defined by Natural Resource Wales (NRW) on their Development Advice Map. Under Technical Advice Note 15 (TAN 15), a FCA is required if a proposed development:

- includes building or engineering works in Flood Zone C1 or C2;
- includes building or engineering works on land classified as having critical drainage problem;
- changes the use of land or buildings in a location at risk of flooding from rivers or the sea, or with critical drainage problems;
- changes the use of land or buildings in a way that increases the flood vulnerability of the development where it may be subject to other sources of flooding;
- is in Flood Zone B, but larger than 1 hectare.

Given that the proposed application site is located in Flood Zone C2 (Risk of flooding from rivers or the sea, without significant flood defence infrastructure, including flood defences), and includes change of use works, the applicant is required to submit a FCA under TAN 15. The assessment should demonstrate to the Local Planning Authority (LPA) and NRW how flood risk will be managed now and over the development's lifetime, taking climate change into account, and with regard to the vulnerability of its potential users.

The objectives of a FCA to support a planning application are to establish:

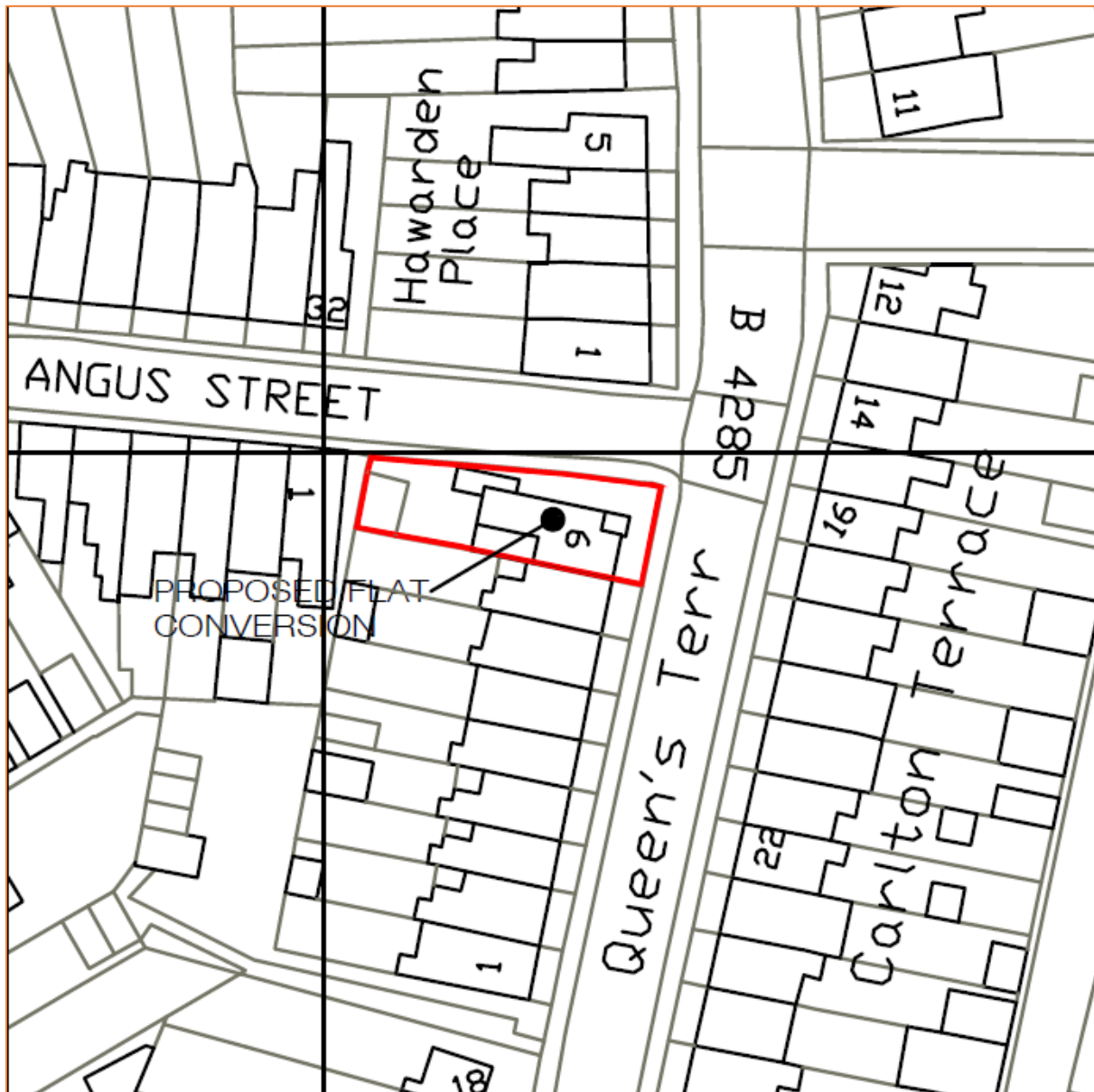
- whether the proposed development is likely to be affected by current or future flooding from any source;
- whether it will increase flood risk elsewhere;
- whether the measures proposed to deal with these effects and risks are appropriate.

Existing Situation

Site Usage:

The site comprises of a single residential dwelling.

Existing plans can be found in the report Appendix.



contains digital elevation data derived from surveys carried out by the EA's specialist remote sensing team. Accurate elevation data is available for over 70% of England. The LiDAR technique records an elevation accurate to $\pm 0.3\text{m}$ every 2m. This dataset is derived from a combination of our full dataset which has been merged and re-sampled to give the best possible coverage. The dataset can be supplied as a Digital Surface Model (DSM) produced from the signal returned to the LiDAR (which includes heights of objects, such as vehicles, buildings and vegetation, as well as the terrain surface) or as a Digital Terrain Model (DTM) produced by removing objects from the Digital Surface Model. 2.0m horizontal resolution DTM LiDAR data has been used for the purposes of this study.

2m LiDAR remotely sensed digital elevation data suggests that the ground topography on site ranges from approximately 145.40m AOD to 140.10m AOD, with the site sloping down from west to east

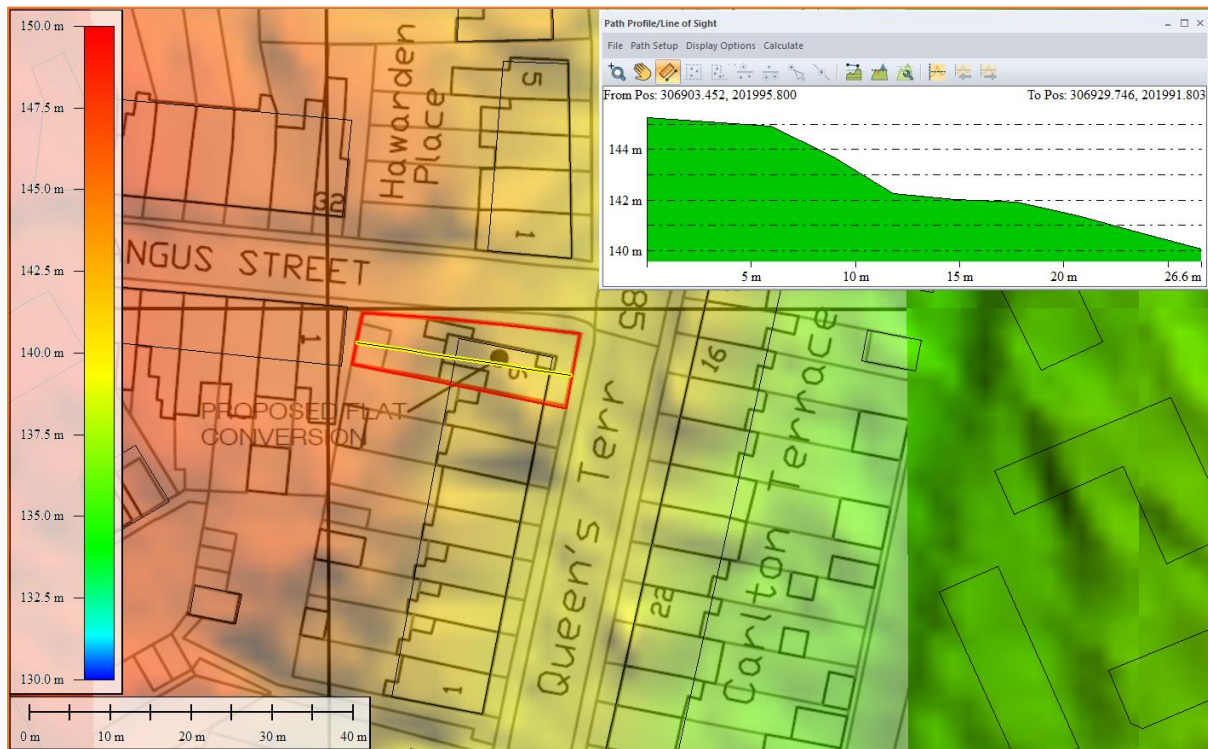


Figure 2: 2m LiDAR DTM showing topographic levels across the site. Transect inset runs from west to east (Source: EA LiDAR, Ordnance Survey mapping overlain)

It should be noted however that the finished ground floor level of the existing building is elevated above street level on Queen's Terrace. Based on LiDAR, the finished ground floor level is approximately 141.70m AOD.



Figure 3: View of the site frontage from Queen's Terrace, with finished ground floor level highlighted in yellow (Source: Avalon Homes Ltd)

Proposed Development

The proposed planning application is for the Conversion of house to two self-contained flats.



Figure 4: Existing and proposed floor plans (Source: Crescent Architectural)

Assessment of Flood Risk

Flood Zones:

Within planning, Flood Zones refer to the probability of river and sea flooding. They are shown on the Natural Resource Wales Development Advice Map, available on Natural Resource Wales' web site.

Description of Zone	Zone Name	Use within the precautionary framework
Considered to be at little or no risk of fluvial or tidal/coastal flooding.	A	Used to indicate that justification test is not applicable and no need to consider flood risk further.
Areas known to have been flooded in the past evidenced by sedimentary deposits.	B	Used as part of a precautionary approach to indicate where site levels should be checked against the extreme (0.1%) flood level. If site levels are greater than the flood levels used to define adjacent extreme flood outline there is no need to consider flood risk further.
Based on Environment Agency extreme flood outline, equal to or greater than 0.1% (river, tidal or coastal)	C	Used to indicate that flooding issues should be considered as an integral part of decision making by the application of the justification test including assessment of consequences.
Areas of the floodplain which are developed and served by significant infrastructure, including flood defences.	C1	Used to indicate that development can take place subject to application of justification test, including acceptability of consequences
Areas of the floodplain without significant flood defence infrastructure.	C2	Used to indicate that only less vulnerable development should be considered subject to application of justification test, including acceptability of consequences. Emergency services and highly vulnerable development should not be considered.

Table 1: Flood Zones

The Flood Zones shown on the Natural Resource Wales Development Advice Map do not take account of the possible impacts of climate change and consequent changes in the future probability of flooding.

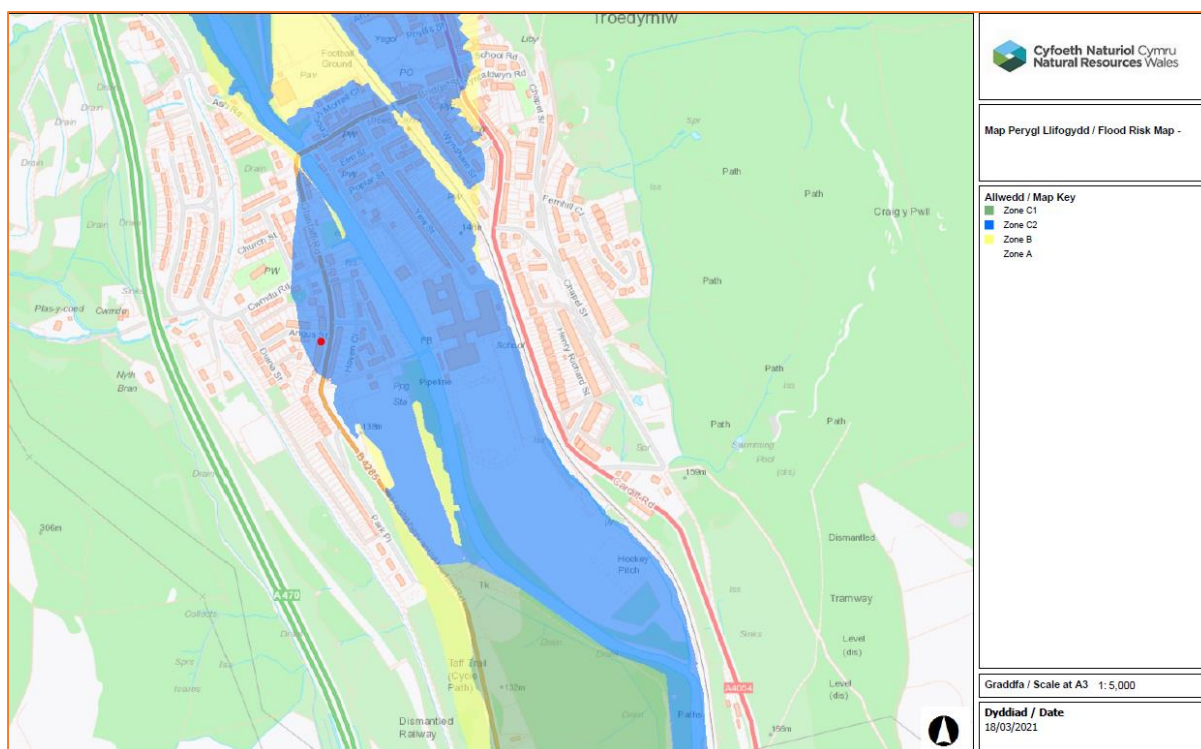


Figure 5: Natural Resource Wales Development Advice Map (Source: NRW)

The site is located within Flood Zone C2 (Risk of flooding from rivers or the sea, without significant flood defence infrastructure, including flood defences), which means it is defined as land having at least a 1 in 1000 annual probability of fluvial flooding.

The risk would appear to be fluvial / tidal and originate from the River Taff.

Fluvial (River Taff):

The River Taff (Welsh: Afon Taf) is a river in Wales. It rises as two rivers in the Brecon Beacons; the Taf Fechan (Little Taff) and the Taf Fawr (Big Taff) before becoming one just north of Merthyr Tydfil. Its confluence with the River Severn estuary is in Cardiff. From its confluence at Cefn-coed-y-cymmer, the river flows south, passing several towns. It picks up a few tributaries, such as the River Cynon, River Rhondda, Bargoed Taf and Nant Clydach. It flows through Pontypridd and through to Taff's Well, the site of Wales' only thermal spring. It flows underneath the M4 Motorway, before turning south-eastward and flowing through the Cardiff suburbs of Radyr, Whitchurch, Llandaff, Pontcanna, the city centre and Grangetown, before emptying into Cardiff Bay, near to the mouth of the River Ely.

Modelled flood levels and extents:

Modelled flood levels and flood extents have been received from the NRW as part of a flood data request (NRW ref: ATI-21002a).

Modelled flood data has been provided by NRW from the Merthyr Tydfil to Merthyr Vale - Depth and Velocity Mapping Study (2017).

In August 2016 Welsh Government updated the Climate Change allowances for planning purposes which will be adopted into FCAs. NRW are expected to use these climate projections from 1st December 2016. The site falls within the Severn River Basin District, where the Climate Change central estimate is a 25% climate change factor.

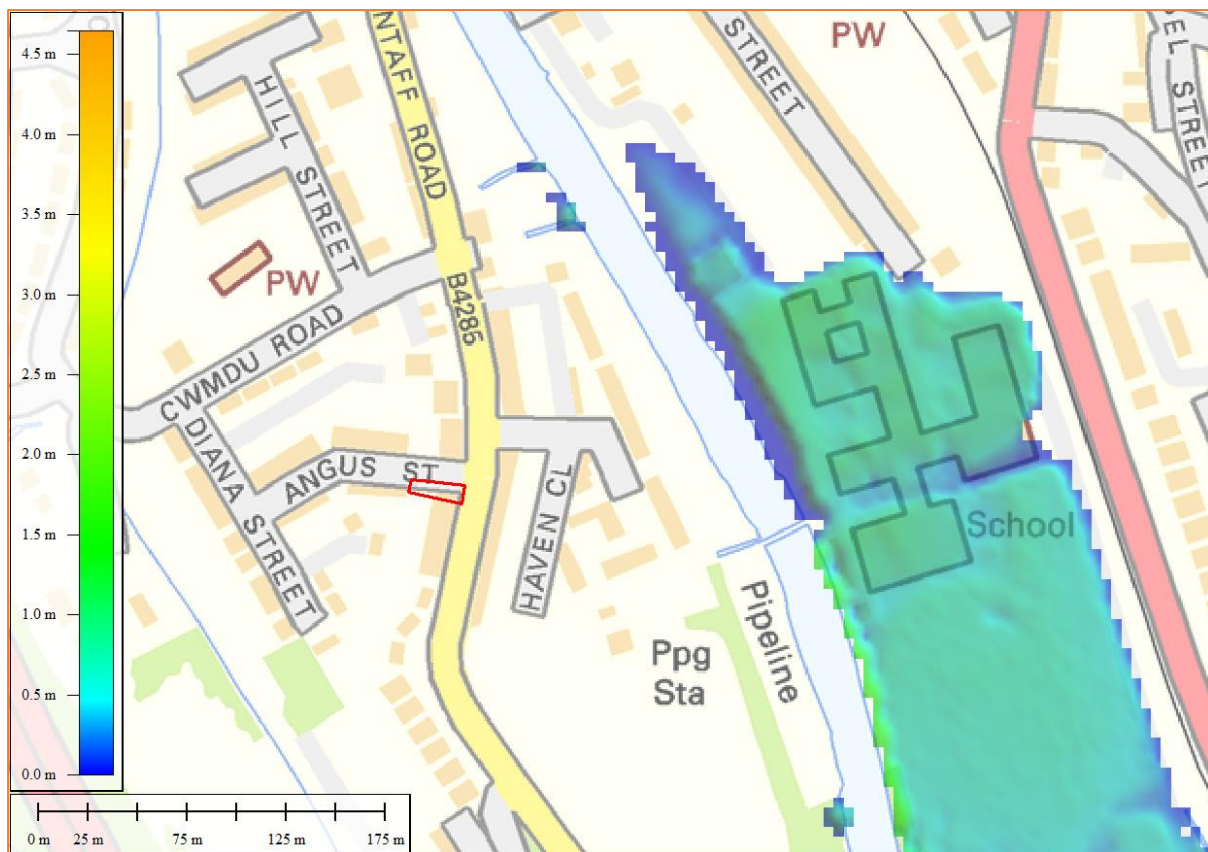


Figure 6: Maximum Depth Map for undefended 1% AEP (1 in 100 year) event (Source: NRW)

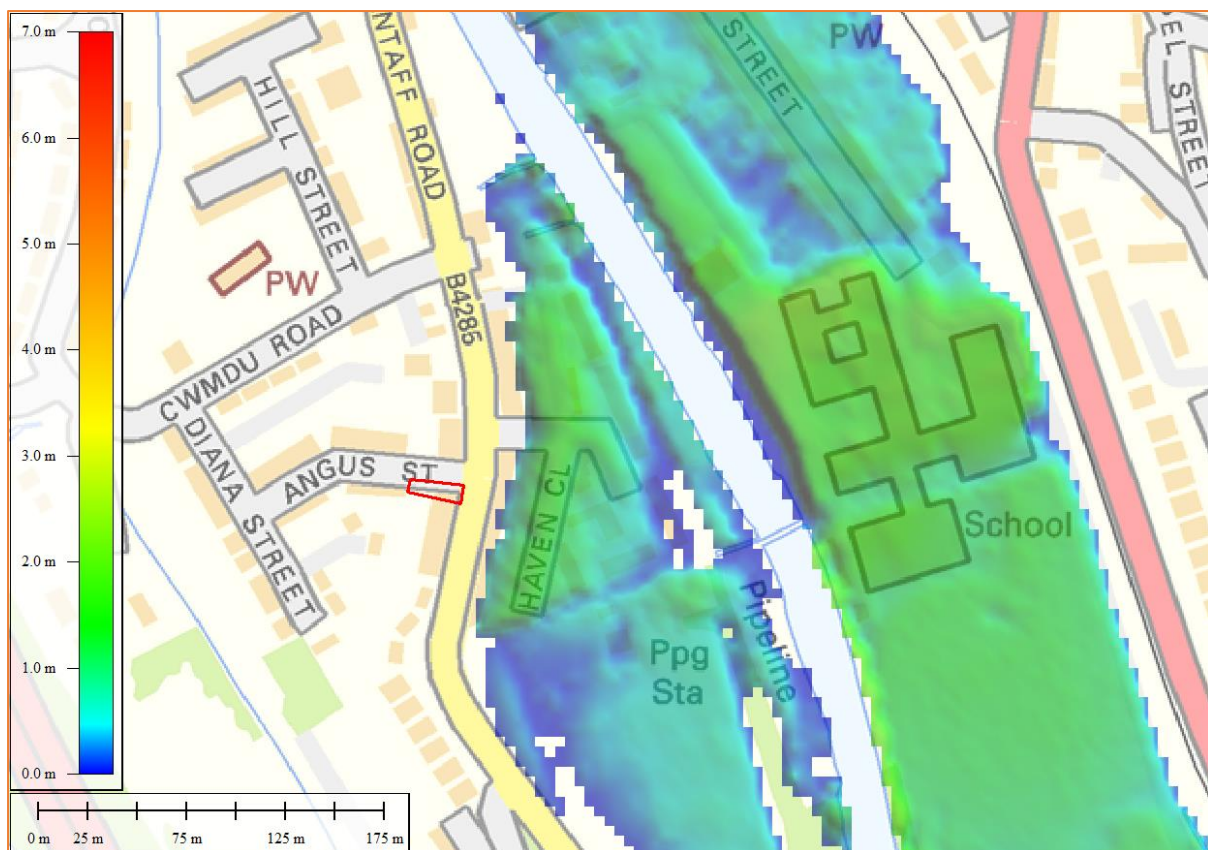


Figure 7: Maximum Depth Map for undefended 0.1% AEP (1 in 1000 year) event (Source: NRW)

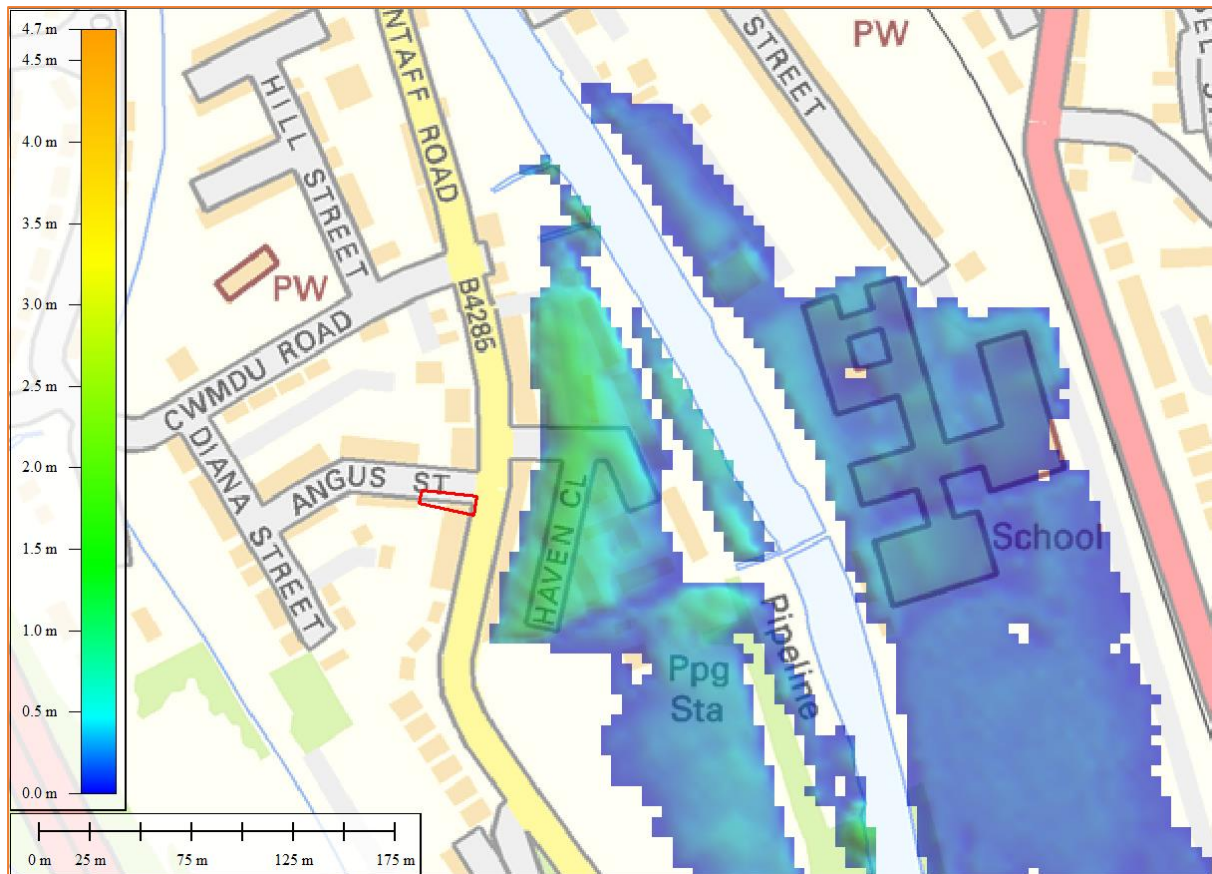


Figure 8: Maximum Depth Map for defended 1% AEP (1 in 100 year) event (Source: NRW)

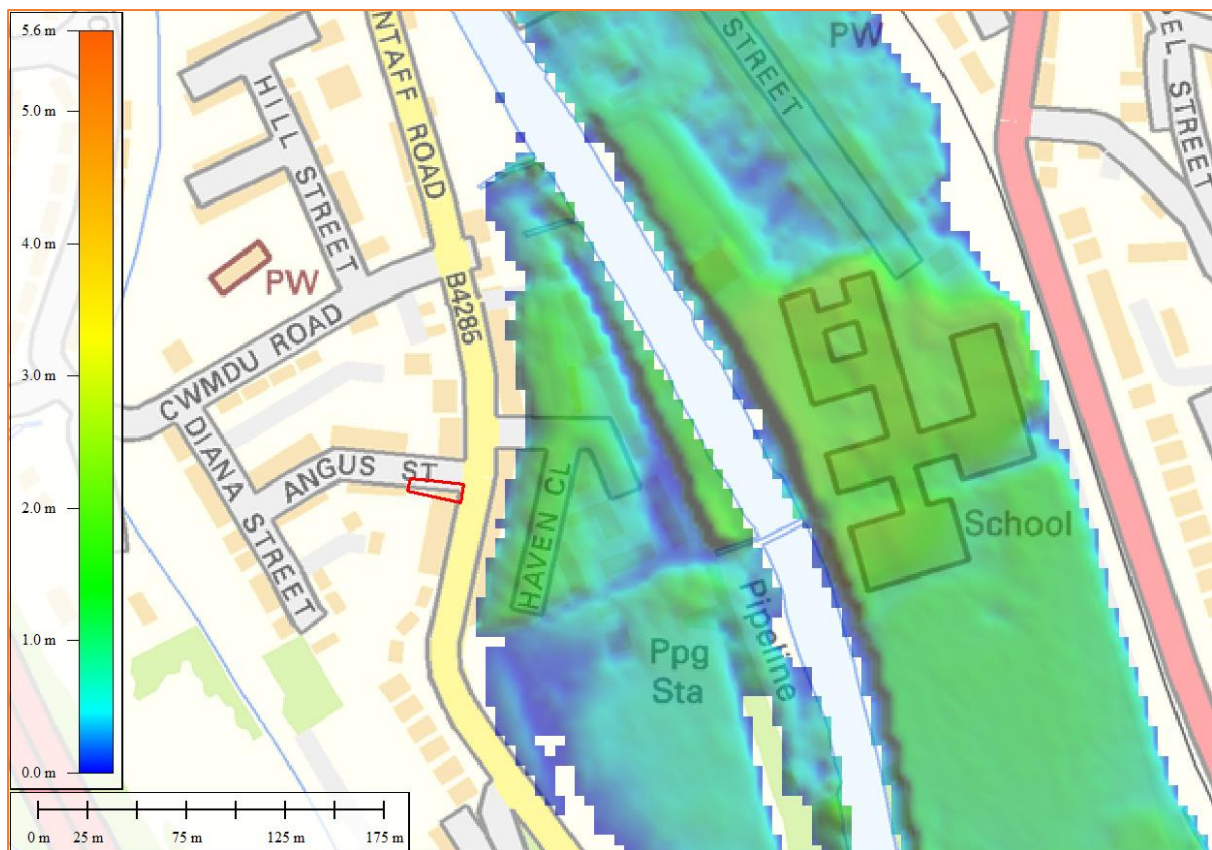


Figure 9: Maximum Depth Map for defended 0.1% AEP (1 in 1000 year) event (Source: NRW)

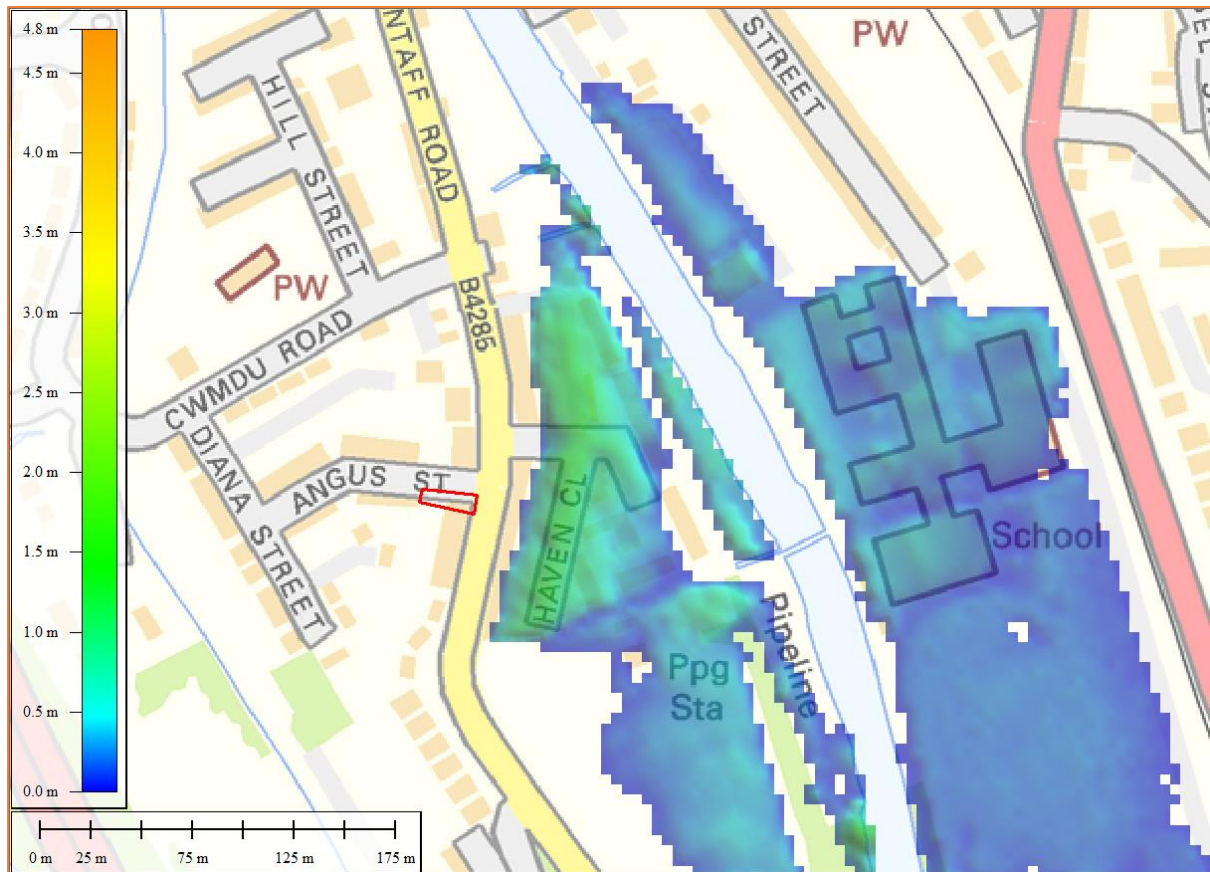


Figure 10: Maximum Depth Map for defended 1% AEP event plus Climate Change (1 in 100 year plus climate change) event
(Source: NRW)

The modelled flood data provided by NRW shows that the site is entirely outside of the modelled defended and undefended 1:100 year and 1:1000 year modelled flood extents, at the present day, and outside of the defended 1:100 year flood extent with an allowance for climate change.

Closer analysis of the NRW Flood Zone extents at the site, shows that the Flood Zone C2 extent which covers the site is based on the 1979 historic flood extent, and not fluvial model data.

As such, while the site is shown to be located within Flood Zone C2, the site is entirely outside of the modelled 1:1000 year flood extent (and the modelled 1:100 year flood extent with allowance for climate change).

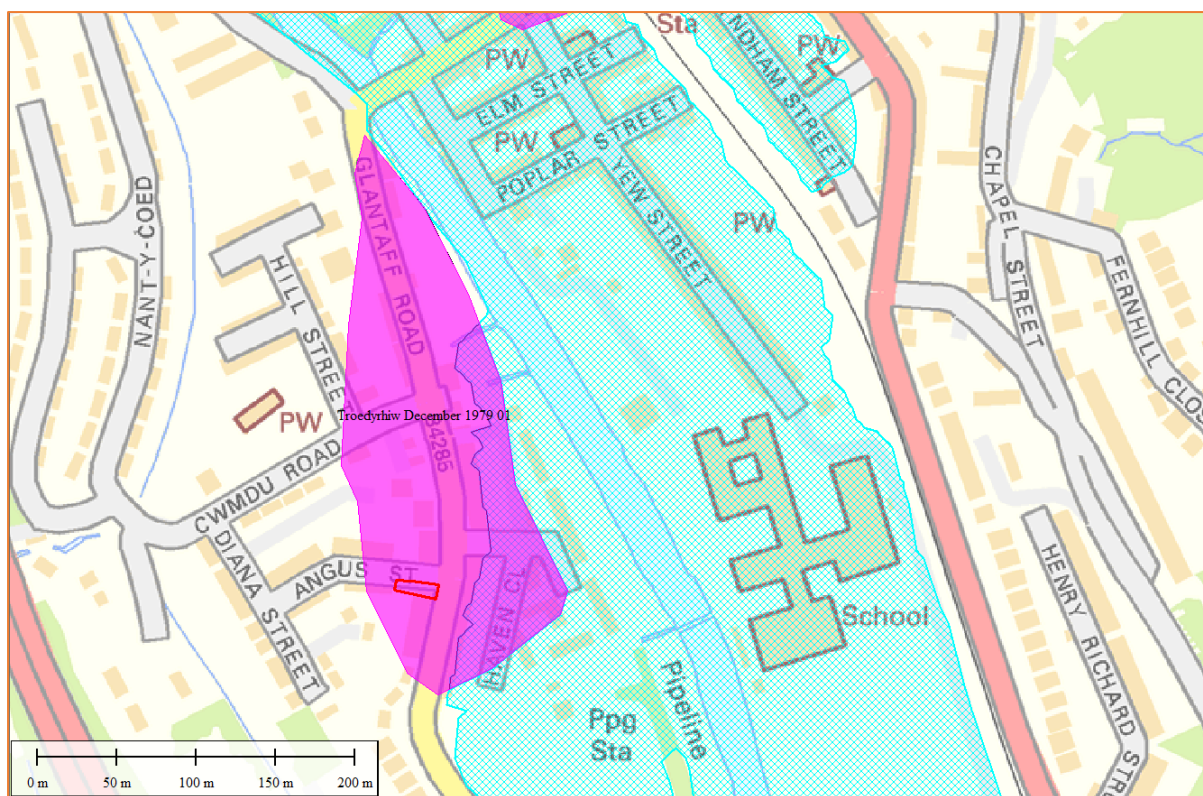


Figure 11: Flood Zone 2 (Flood Zone C2) fluvial model extent shown by blue hatch, Flood Zone 2 (Flood Zone C2) fluvial event (historic) extent shown by pink shading (Source: NRW)

Flood defences:

According to NRW there no formal flood defences that benefit the site.

Historical flood records:

According to NRW the site is shown to be within their historic flood map. The site is shown to be within the historic flood extent from Troeddyrhiw in December 1979. This event was caused by the channel capacity being exceeded (no raised defences).

Pluvial (Surface Water):

Pluvial (surface water) flooding happens when rainwater does not drain away through the normal drainage systems or soak into the ground, but lies on or flows over the ground instead.

In 2013 the EA and NRW, working with Lead Local Flood Authorities (LLFAs), produced an updated Flood Map for Surface Water. It is considered to represent a significant improvement on the previous surface water flood maps available, both in terms of method and representation of the risk of flooding. The modelling techniques and data used are considerably improved, and also incorporated locally produced mapping where this is available to represent features best modelled at a local scale.

The Flood Map for Surface Water assesses flooding scenarios as a result of rainfall with the following chance of occurring in any given year (annual probability of flooding is shown in brackets):

- 1:30 (3.3%)
- 1:100 (1%)
- 1:1000 (0.1%)

The mapping below shows the Risk of Flooding from Surface Water centred on the site. Please note that NRW do not consider this information suitable to be used to identify the risk to individual properties or sites. It is useful to raise awareness in areas which may be at risk and may require additional investigation.

The Natural Resources Wales Surface Water Flood Map suggests that the site lies outside of areas of "Low", "Medium" and "High" risk of flooding from surface water and small watercourses.

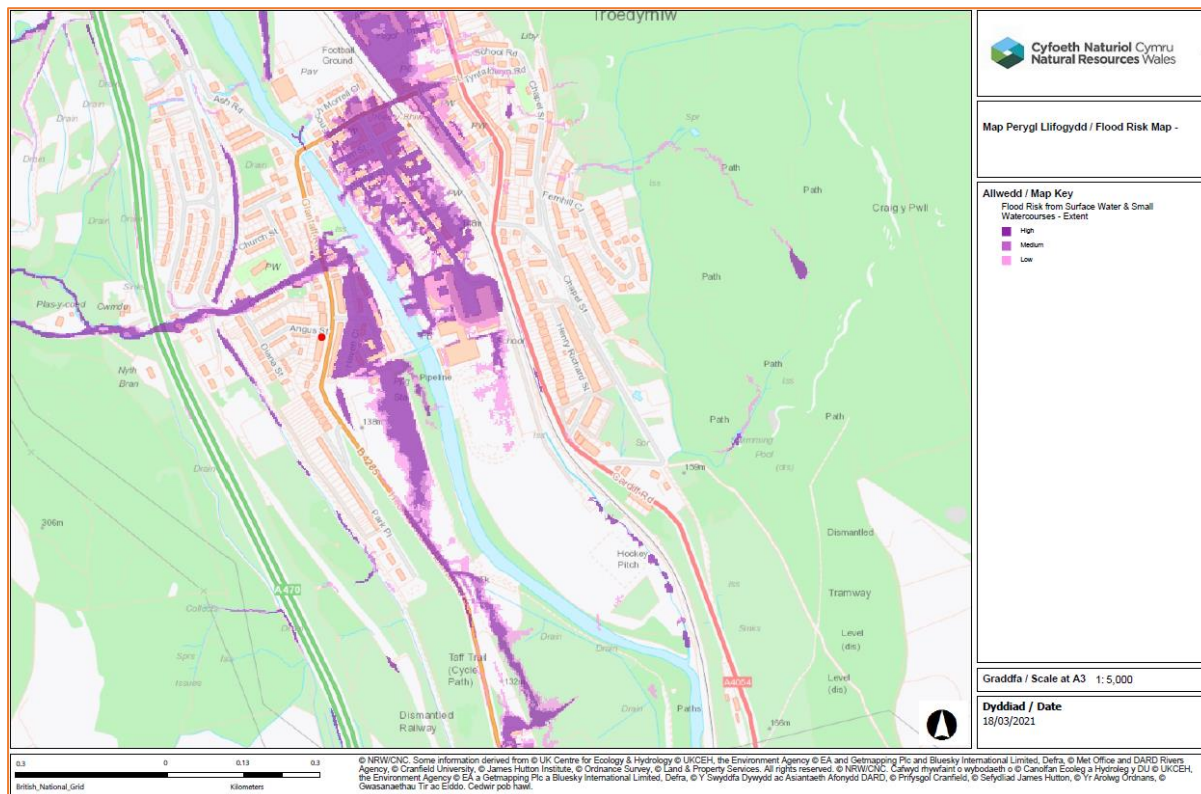


Figure 12: Extract from Natural Resources Wales Surface Water Flood Map (Source: NRW)

Groundwater:

Groundwater flooding occurs as a result of water rising up from the underlying rocks or from water flowing from abnormal springs. This tends to occur after much longer periods of sustained high rainfall. Higher rainfall means more water will infiltrate into the ground and cause the water table to rise above normal levels. Groundwater tends to flow from areas where the ground level is high, to areas where the ground level is low. In low-lying areas the water table is usually at shallower depths anyway, but during very wet periods, with all the additional groundwater flowing towards these areas, the water table can rise up to the surface causing groundwater flooding.

Groundwater flooding is most likely to occur in low-lying areas underlain by permeable rocks (aquifers). These may be extensive, regional aquifers, such as chalk or sandstone, or may be localised sands or river gravels in valley bottoms underlain by less permeable rocks. Groundwater flooding takes longer to dissipate because groundwater moves much more slowly than surface water and will take time to flow away underground.

No information has been provided to suggest that the site is susceptible to groundwater flooding.

Sewer Surcharge:

Sewer flooding occurs when the sewer network cannot cope with the volume of water that is entering it. It is often experienced during times of heavy rainfall when large amounts of surface water overwhelm the sewer network causing flooding. Temporary problems such as blockages, siltation, collapses and equipment or operational failures can also result in sewer flooding.

All Water Companies have a statutory obligation to maintain a register of properties/areas which have reported records of flooding from the public sewerage system, and this is shown on the DG5 Flood Register. This includes records of flooding from foul sewers, combined sewers and surface water sewers which are deemed to be public and therefore maintained by the Water Company. The DG5 register records of flood incidents resulting in both internal property flooding and external flooding incidents. Once a property is identified on the DG5 register, water companies can typically put funding in place to address the issues and hence enable the property to be removed from the register. It should be noted that flooding from land drainage, highway drainage, rivers/watercourses and private sewers is not recorded within the register.

No information has been provided to suggest that the site is susceptible to sewer surcharge flooding.

Other Sources:

The Natural Resources Wales Risk of Flooding from Reservoirs Map suggests that the site lies within the “Maximum extent of flooding” from reservoir failure. The Natural Resources Wales also advise on their website that reservoir flooding is extremely unlikely. All major reservoirs have to be inspected by specialist dam and reservoir Engineers. These inspections are monitored and enforced by the Natural Resources Wales themselves. The risk to the site from reservoir flooding is therefore minimal and is far lower than that relating to the potential for fluvial flooding to occur.

There do not appear to be any further artificial (man-made) sources of flood risk (such as raised canals) in the vicinity of the site.

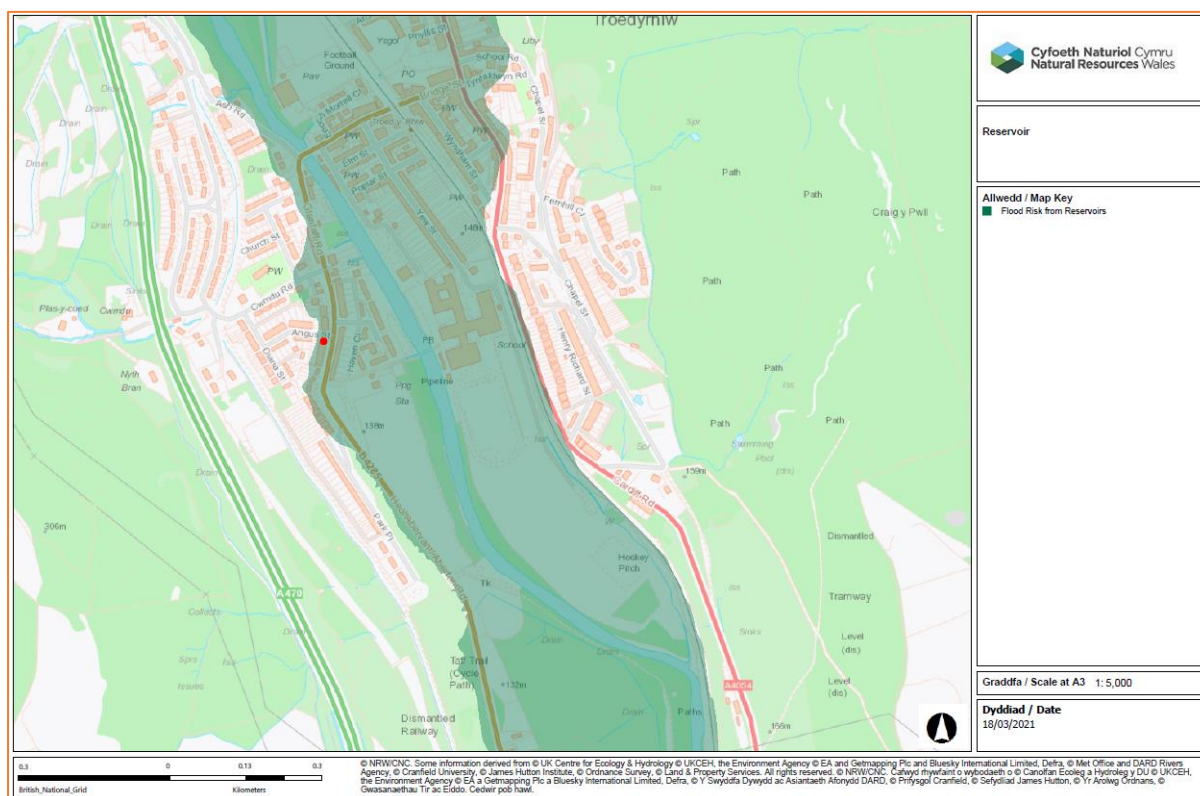


Figure 13: Extract from Natural Resources Wales risk of flooding from reservoirs (Source: NRW)

Flood Risk Management Measures

Vulnerability to flooding:

TAN15 classifies property usage by vulnerability to flooding.

The existing site usage is a single residential dwelling, which is classified as “highly vulnerable development” under TAN15.

Post development, the site will remain “highly vulnerable development” throughout, as the application is for the Conversion of house to two self-contained flats. There will be the introduction of an additional residential unit.

Particular flooding consequences may not be acceptable for particular types of development. For example, allowing residential development in areas which are subject to high risks of flooding can result in a traumatic impact on people's lives. The precautionary framework identifies the vulnerability of different land uses to flooding, and for this purpose, development has been subdivided into three categories:

Development category	Types
Emergency services	hospitals, ambulance stations, fire stations, police stations, coastguard stations, command centres, emergency depots and buildings used to provide emergency shelter in time of flood
Highly vulnerable development	all residential premises (including hotels and caravan parks), public buildings (e.g. schools, libraries, leisure centres), especially vulnerable industrial development (e.g. power stations, chemical plants, incinerators), and waste disposal sites
Less vulnerable development	general industrial, employment, commercial and retail development, transport and utilities infrastructure, car parks, mineral extraction sites and associated processing facilities, excluding waste disposal sites

Table 2: Vulnerability to flooding categories

The Emergency Services category describes facilities which need to be operational and accessible at all times. Highly vulnerable development describes development where the ability of occupants to decide on whether they wish to accept the risks to life and property associated with flooding, or be able to manage the consequences of such a risk, is limited. It also includes those industrial uses where there would be an attendant risk to the public and the water environment should the site be inundated. Less vulnerable development describes development where the ability of occupants to decide on whether they wish to accept such risks is greater than that in the highly vulnerable category. The vulnerability attributed to a mixed use proposal will be defined by the most vulnerable use.

There are uses which are considered to be exceptions to the general rule, and have not been classified above, because they are required in a fluvial, tidal or coastal location by virtue of their nature. These include boatyards, marinas, essential works required at mooring basins, and development associated with canals.

Physical Design Measures:

In accordance with section A1.14 of TAN15 there is a frequency threshold of flooding below which flooding of development should not be allowed. The following table, taken from TAN15, provides indicative guidance as to what the frequency threshold could be for different types of development in terms of annual probability of occurrence:

Type of development	Threshold frequency	
	Fluvial	Tidal
Residential	1%	0.5%
Commercial / retail	1%	0.5%
Industrial	1%	0.5%
Emergency services	0.1%	0.1%
General infrastructure	1%	0.5%

Table 3: TAN15 Flood frequency thresholds

The modelled flood data provided by NRW shows that the site is entirely outside of the modelled defended and undefended 1:100 year and 1:1000 year modelled flood extents, at the present day, and outside of the defended 1:100 year flood extent with an allowance for climate change.

Closer analysis of the NRW Flood Zone extents at the site, shows that the Flood Zone C2 extent which covers the site is based on the 1979 historic flood extent, and not fluvial model data.

As such, while the site is shown to be located within Flood Zone C2, the site is entirely outside of the modelled 1:1000 year flood extent (and the modelled 1:100 year flood extent with allowance for climate change).

It is not possible to raise the floor levels as part of the development as it is a change of use of an existing building.

2m LiDAR remotely sensed digital elevation data suggests that the ground topography on site ranges from approximately 145.40mAOD to 140.10mAOD, with the site sloping down from west to east

It should be noted however that the finished ground floor level of the existing building is elevated above street level on Queen's Terrace. Based on LiDAR, the finished ground floor level is approximately 141.70mAOD – which is approximately 1.6m above the topographic level on Queens Terrace. Queens Terrace is entirely outside of the modelled flood extents provided by NRW (including the 1:1000 year and 1:100 year plus climate change scenarios).

To help protect against flooding during extreme events, the application has agreed to implement flood resistant design measures into the ground floor, in consultation with the Local Authority building control department.

These measures can include the following where practical and feasible:

- Solid concrete installed at ground floor level to contain waterproof membrane;
- Waterproof screed used on floors;
- Closed-cell foam used in wall cavities;
- Waterproof additive in ground floor internal and external render;
- Exterior ventilation outlets, utility points and air bricks fitted with removable waterproof covers;
- Ground floor electrical main ring run from first floor level; and on separately switched circuit from first floor;
- Electrical incomer and meter situated above likely flood level at least 0.5m above ground floor level;
- Boilers, control and water storage / immersion installed at least 1m above ground floor level;
- Gas meter installed at least 0.5m above ground floor level;
- Plumbing insulation of closed-cell design;
- Non-return valves fitted to all drain and sewer outlets;
- Manhole covers secured;
- Anti-syphon fitted to all toilets;
- Built-in furniture units of solid, water resistant material;
- Use of MDF carpentry (i.e. skirting, architrave, built-in storage) avoided at ground floor level;
- Stairs treated to resist water penetration.

It is recommended that demountable flood barriers are installed on ground level external doors.

Safe Escape:

TAN 15 requires a route of safe escape for all residents and uses to be provided from new residential properties in Flood Zone C.

Type of development	Maximum depth of flooding (mm)	Maximum rate of rise of floodwaters (m/hr)	Maximum speed of inundation of flood risk area (hrs)	Maximum velocity of floodwaters (metres/sec)
	Property Access			Property Access
Residential (habitable rooms)	600 600	0.1	4	0.15 0.3
Commercial & Retail	600 600	0.3	2	0.15 0.3
Industrial	1000 1000	0.3	2	0.3 0.45
Emergency Services	450 600	0.1	4	0.15 0.3
General Infrastructure	600 600	0.3	2	0.3 0.3

Table 4: TAN15 Table A1.15

Table A1.15 shows the threshold frequency beyond which proposed development would be expected to flood under extreme conditions (1:100 year event with allowance for climate change). For new residential development a maximum flood depth of 600mm would be allowance at the property and for the site access.

The modelled flood data provided by NRW shows that the site is entirely outside of the modelled defended and undefended 1:100 year and 1:1000 year modelled flood extents, at the present day, and outside of the defended 1:100 year flood extent with an allowance for climate change.

As such, while the site is shown to be located within Flood Zone C2, the site is entirely outside of the modelled 1:1000 year flood extent (and the modelled 1:100 year flood extent with allowance for climate change).

Queens Terrace is entirely outside of the modelled flood extents provided by NRW (including the 1:1000 year and 1:100 year plus climate change scenarios).

Site users should exit the site to Angus street, and travel west along Angus Street and north along Diana Street. This route is away from the source of flooding, and is entirely outside of all the modelled flood extents provided.

Flood Alert/Warnings:

The NRW is responsible for issuing flood warnings. Flood warnings are issued to the emergency services and local authorities. Both private individuals and organisations can sign-up to receive warnings via phone, text or email. This system of receiving warnings is currently voluntary.

Advice regarding severe flood warnings will generally be given during weather forecasts on local radio and TV. In the case of extreme events, warnings can also be disseminated via door to door visits by the police or locally appointed flood wardens.

The applicant has agreed to implement a flood warning and evacuation plan post development, and subscribe to the NRW's flood warning service. It should be noted that while the site falls within the Flood Alert Area: River Taff (Quickdial number: 502010).

The site is in a NRW Flood Alert Area. The NRW issue flood warnings to specific areas when flooding is expected. It is recommended that the applicant registers online with the free NRW Floodline Warnings Direct service at <https://www.fws.environment-agency.gov.uk/app/olr/home?style=NRW&lang=en> to receive flood warnings by phone, text or email.

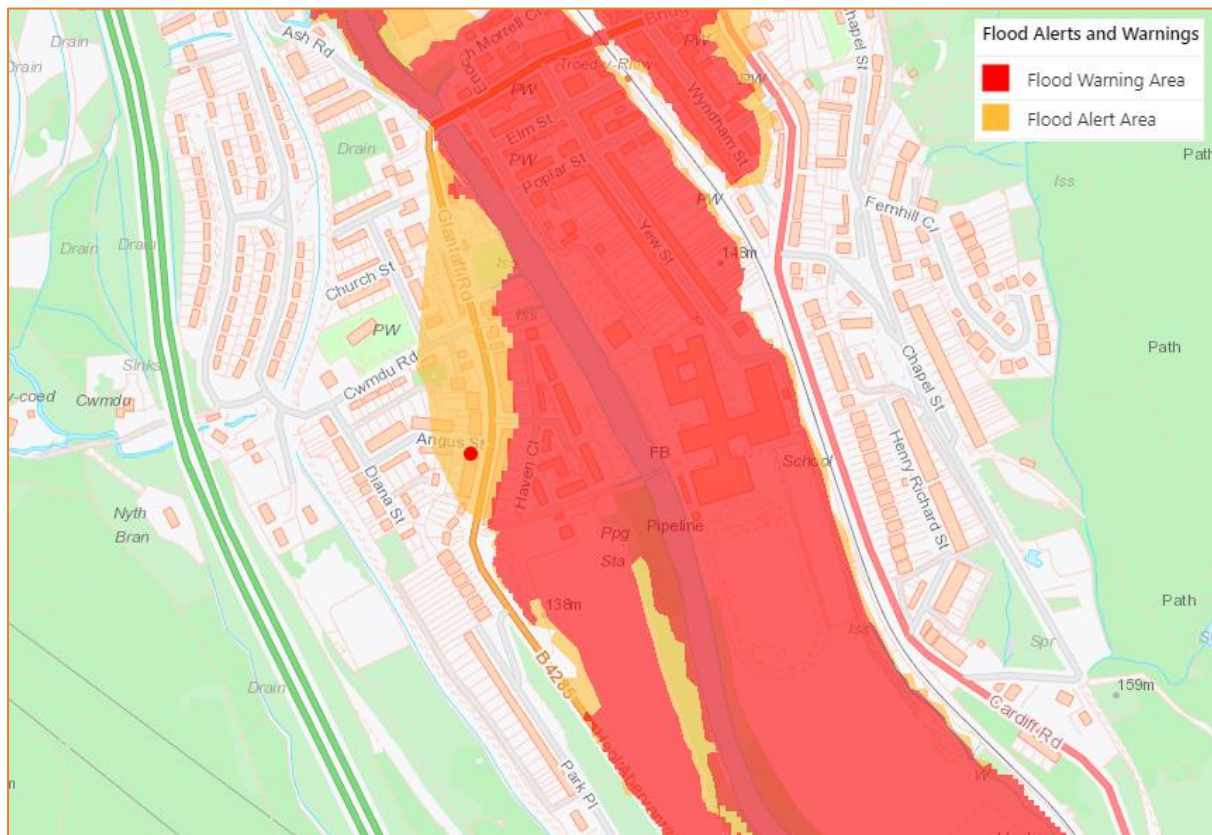


Figure 14: NRW Flood Warning and Alert Areas (Source: NRW)

Flood Warning:

The flood warning service has three types of warnings that will help you prepare for flooding and take action:

Flood Warning	Flood Alert	Flood Warning	Severe Flood Warning
			
What it means?	Flooding is possible. Be prepared.	Flooding is expected. Immediate action required.	Severe flooding. Danger to life.
When it's used?	Two hours to two days in advance of flooding.	Half an hour to one day in advance of flooding.	When flooding poses a significant threat to life.
What to do?	Be prepared to act on your flood plan. Prepare a flood kit of essential items. Monitor local water levels and the flood forecast on our website.	Move family, pets and valuables to a safe place. Turn off gas, electricity and water supplies if safe to do so. Put flood protection equipment in place.	Stay in a safe place with a means of escape. Be ready should you need to evacuate from your home. Co-operate with the emergency services. Call 999 if you are in immediate danger.

Table 5: Flood Warnings

Flood Plan:

It is recommended that the applicant and future owners, occupiers and Landlords of the property prepare a flood plan to protect life and property during a flood event:

Before a flood:

- Find out if you are at risk of flooding.
- Find out if you can receive flood warnings.
- Prepare and keep a list of all your important contacts to hand or save them on your mobile phone.
- Think about what items you can move now and what you would want to move to safety during a flood such as pets, cars, furniture, and electrical equipment.
- Know how to turn off gas, electricity and water supplies.
- Prepare a flood kit of essential items and keep it handy. It can include copies of important documents, a torch, a battery-powered or wind-up radio, blankets and warm clothing, waterproofs, rubber gloves and a first aid kit including all essential medication.
- Consider buying flood protection products such as flood boards and airbrick covers to help reduce flood water getting into your property.

During a flood:

- Tune into your local radio station on a battery or wind-up radio.
- Fill jugs and saucepans with water.

- Grab your flood kit - if you have prepared one.
- Collect blankets, torch, first aid kit, medication and food.
- Move important documents, personal items, valuables, and lightweight belongings upstairs or to high shelves.
- Raise large items of furniture, or put them in large bags if you have them.
- Move people, outdoor belongings, cars and pets to higher ground.
- Switch off water, gas and electricity at mains when water is about to enter your home. Do not touch sources of electricity when standing in water.
- Fit flood protection products, if you have them, for example flood boards, airbrick covers, sandbags.
- Put plugs in sinks and baths. Weigh them down with a pillowcase or plastic bag filled with soil.
- If you do not have non-return valves fitted, plug water inlet pipes with towels or cloths.
- Move your family and pets upstairs or to a high place with a means of escape.
- Listen to the advice of the emergency service and evacuate if told to do so.
- Avoid walking or driving through flood water. Six inches of fast-flowing water can knock over an adult and two feet of water can move a car.

After a flood:

- If you have flooded, contact your insurance company as soon as possible.
- Take photographs and videos of your damaged property as a record for your insurance company.
- If you don't have insurance, contact your local authority for information on grants and charities that may help you.
- Flood water can contain sewage, chemicals and animal waste. Always wear waterproof outerwear, including gloves, wellington boots and a face mask.
- Have your electrics, central heating and water checked by qualified engineers before switching them back on.

Off-Site Impacts**Floodplain storage:**

TAN15 requires that where development is proposed in undefended areas of floodplain, which lie outside of the functional floodplain, the implications of ground raising operations for flood risk elsewhere needs to be considered. Raising existing ground levels may reduce the capacity of the floodplain to accommodate floodwater and increase the risk of flooding by either increasing the depth of flooding to existing properties at risk or by extending the floodplain to cover properties normally outside of the floodplain. Flood storage capacity can be maintained by lowering ground levels either within the curtilage of the development or elsewhere in the floodplain, in order to maintain at least the same volume of flood storage capacity within the floodplain.

In undefended tidal areas, raising ground levels is unlikely to impact on maximum tidal levels so the provision of compensatory storage should not be necessary.

For development in a defended flood risk area, the impact on residual flood risk to other properties needs to be considered. New development behind flood defences can increase the residual risk of flooding if the flood defences are breached or overtopped by changing the conveyance of the flow paths or by displacing flood water elsewhere. If the potential impact on residual risk is unacceptable then mitigation should be provided.

The proposal is for the change of use of the existing building, as such post development, there will be no unacceptable loss of floodplain storage or increase in run-off from the site.

Surface Water Drainage Strategy:

From 7 January 2019, all new developments of more than 1 dwelling house or where the construction area is 100m² or more, will require Sustainable Drainage Systems (SuDS) for surface water.

The development is for the change of use of the existing dwelling to two flats, and does not include any additional construction.

The development is for the change of use of the existing building. As such, there will be no change in the impermeable coverage on site post development, and no change to the existing drainage system on site.

Conclusion

Unda Consulting Limited have been appointed by Avalon Homes Ltd to undertake a Site Specific Flood Consequence Assessment (FCA) for 9 Queens Terrace, Troedyrhiw, Merthyr Tydfil CF48 4ER.. The FCA has been undertaken in accordance with Technical Advice Note 15 (TAN 15) and the associated technical guidance.

The proposed planning application is for the Conversion of house to two self-contained flats.

The existing site usage is a single residential dwelling, which is classified as “highly vulnerable development” under TAN15. Post development, the site will remain “highly vulnerable development” throughout, as the application is for the Conversion of house to two self-contained flats. There will be the introduction of an additional residential unit.

The site is located within Flood Zone C2 (Risk of flooding from rivers or the sea, without significant flood defence infrastructure, including flood defences), which means it is defined as land having at least a 1 in 1000 annual probability of fluvial/tidal flooding.

The risk would appear to be fluvial and originate from the River Taff.

Modelled flood levels and flood extents have been received from the NRW as part of a flood data request (NRW ref: ATI-21002a).

Modelled flood data has been provided by NRW from the Merthyr Tydfil to Merthyr Vale - Depth and Velocity Mapping Study (2017).

The modelled flood data provided by NRW shows that the site is entirely outside of the modelled defended and undefended 1:100 year and 1:1000 year modelled flood extents, at the present day, and outside of the defended 1:100 year flood extent with an allowance for climate change.

Closer analysis of the NRW Flood Zone extents at the site, shows that the Flood Zone C2 extent which covers the site is based on the 1979 historic flood extent, and not fluvial model data.

As such, while the site is shown to be located within Flood Zone C2, the site is entirely outside of the modelled 1:1000 year flood extent (and the modelled 1:100 year flood extent with allowance for climate change).

It is not possible to raise the floor levels as part of the development as it is a change of use of an existing building.

2m LiDAR remotely sensed digital elevation data suggests that the ground topography on site ranges from approximately 145.40mAOD to 140.10mAOD, with the site sloping down from west to east

It should be noted however that the finished ground floor level of the existing building is elevated above street level on Queen's Terrace. Based on LiDAR, the finished ground floor level is approximately 141.70mAOD – which is approximately 1.6m above the topographic level on Queens Terrace. Queens Terrace is entirely outside of the modelled flood extents provided by NRW (including the 1:1000 year and 1:100 year plus climate change scenarios).

Additionally, the risk of flooding posed to the site by pluvial, groundwater, and sewer surcharge flooding would appear to be low.

The development is for the change of use of the existing dwelling to two flats, and does not include any additional construction. The development is for the change of use of the existing building. As such, there will be no change in the impermeable coverage on site post development, and no change to the existing drainage system on site.

In summary:

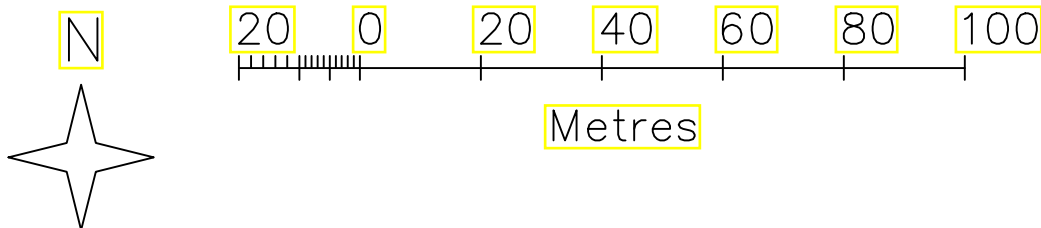
- Flood Zone C2 as defined by Natural Resource Wales (NRW).
- Proposal is for the change of use of the existing building.

- “Highly vulnerable” development throughout (residential properties).
- Risk of pluvial, groundwater and sewer surcharge flooding would appear to be low.
- Site entirely outside modelled 1:100 year and 1:1000 year defended and undefended extent at the present day.
- Site entirely outside of the modelled 1:100 year extent with allowance for climate change.
- Flood proofing of the building will be incorporated as appropriate.
- A flood warning and evacuation plan will be implemented post development.

Assuming accordance with these flood risk management measures, Unda Consulting Limited consider the proposed application to be suitable in flood risk terms.

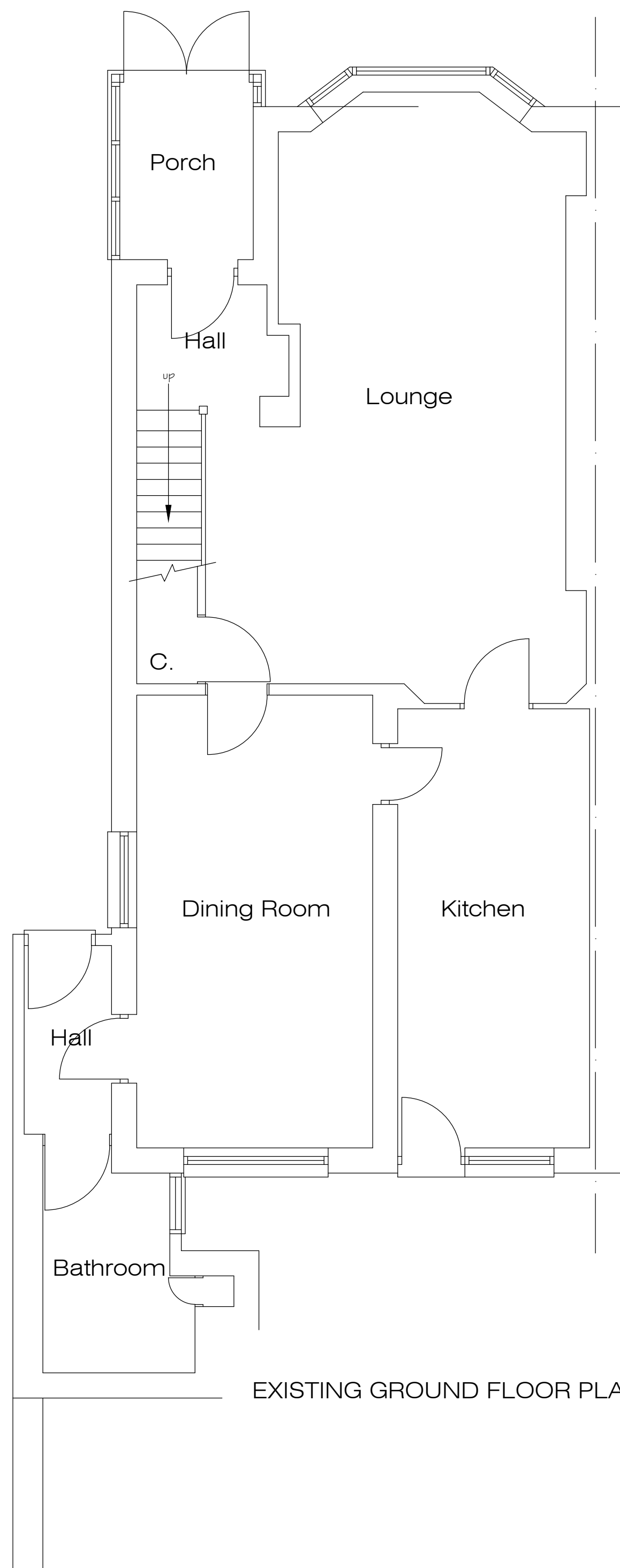
Appendix

- Existing and proposed plans.

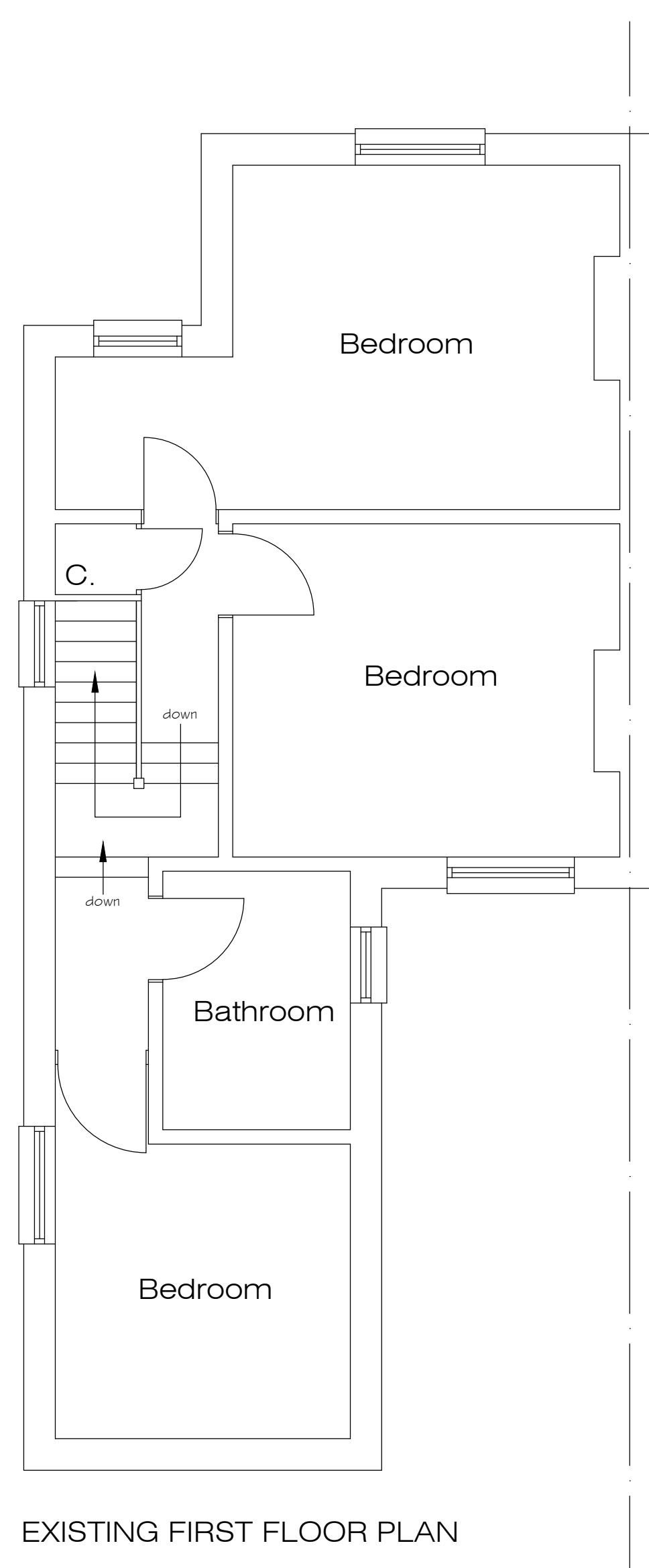


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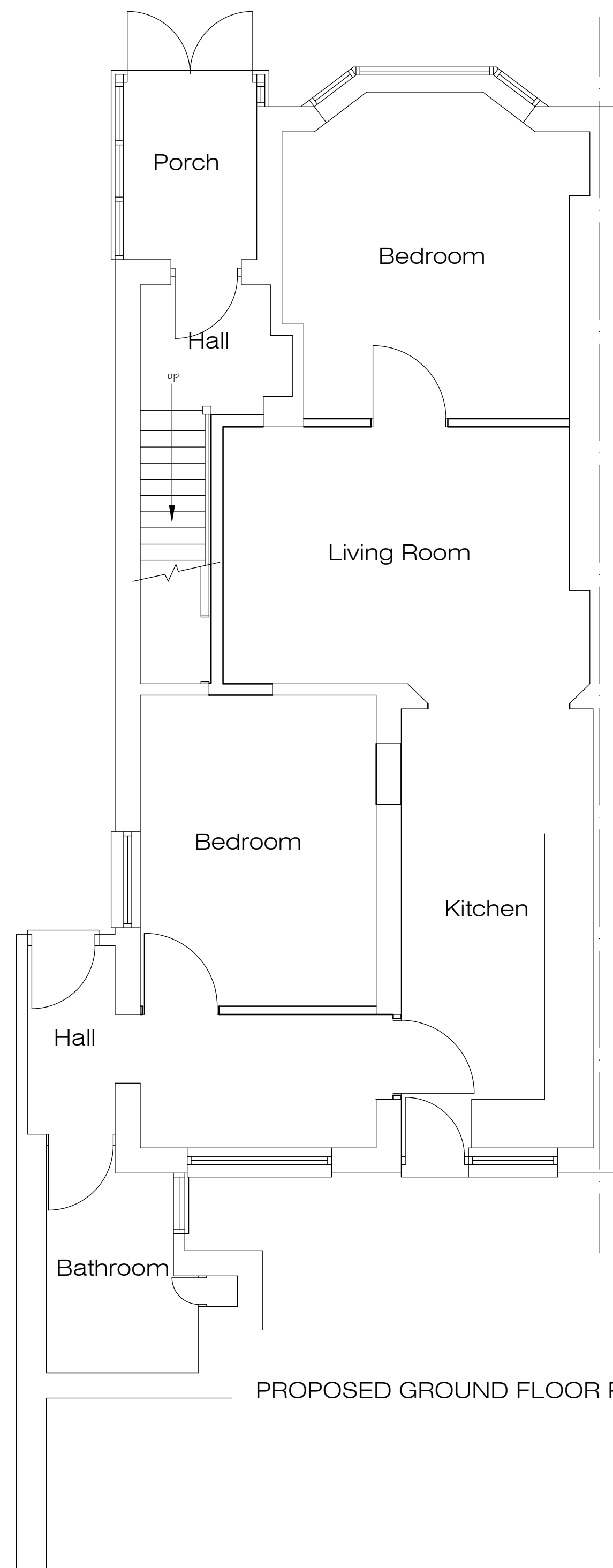
Project Proposed Flat Conversion at 9 Queen's Terrace, Troedryhiw, Merthyr Tydfil, CF48 4ER.	Scale 1/1250 @ A4	Date December 2020.
Description LOCATION PLAN	Drawn	Checked
	Drawing No. PC20/56/2	



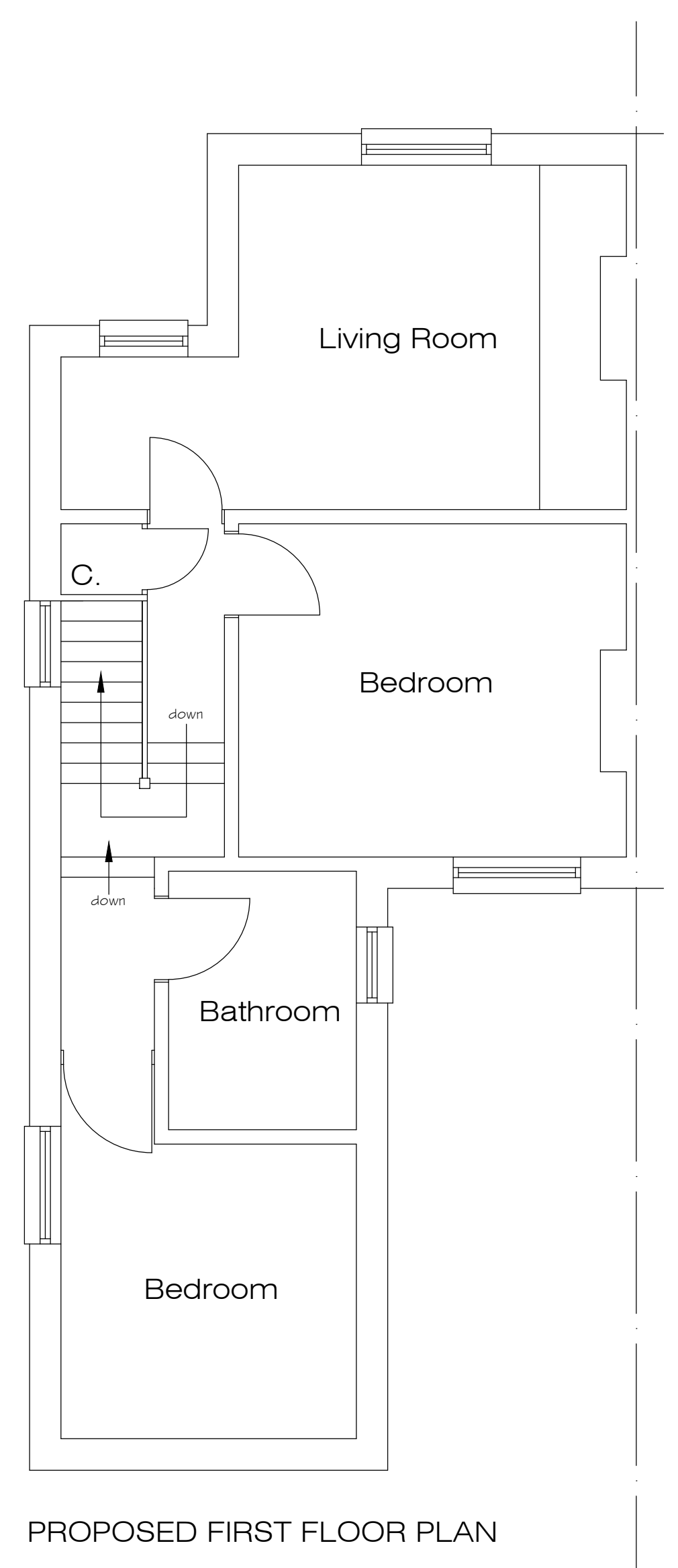
EXISTING GROUND FLOOR PLAN



EXISTING FIRST FLOOR PLAN



PROPOSED GROUND FLOOR PLAN



PROPOSED FIRST FLOOR PLAN



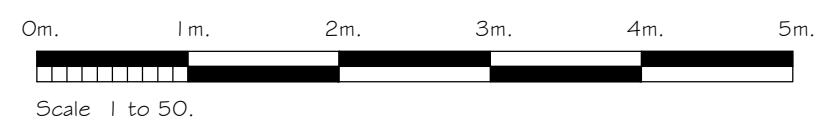
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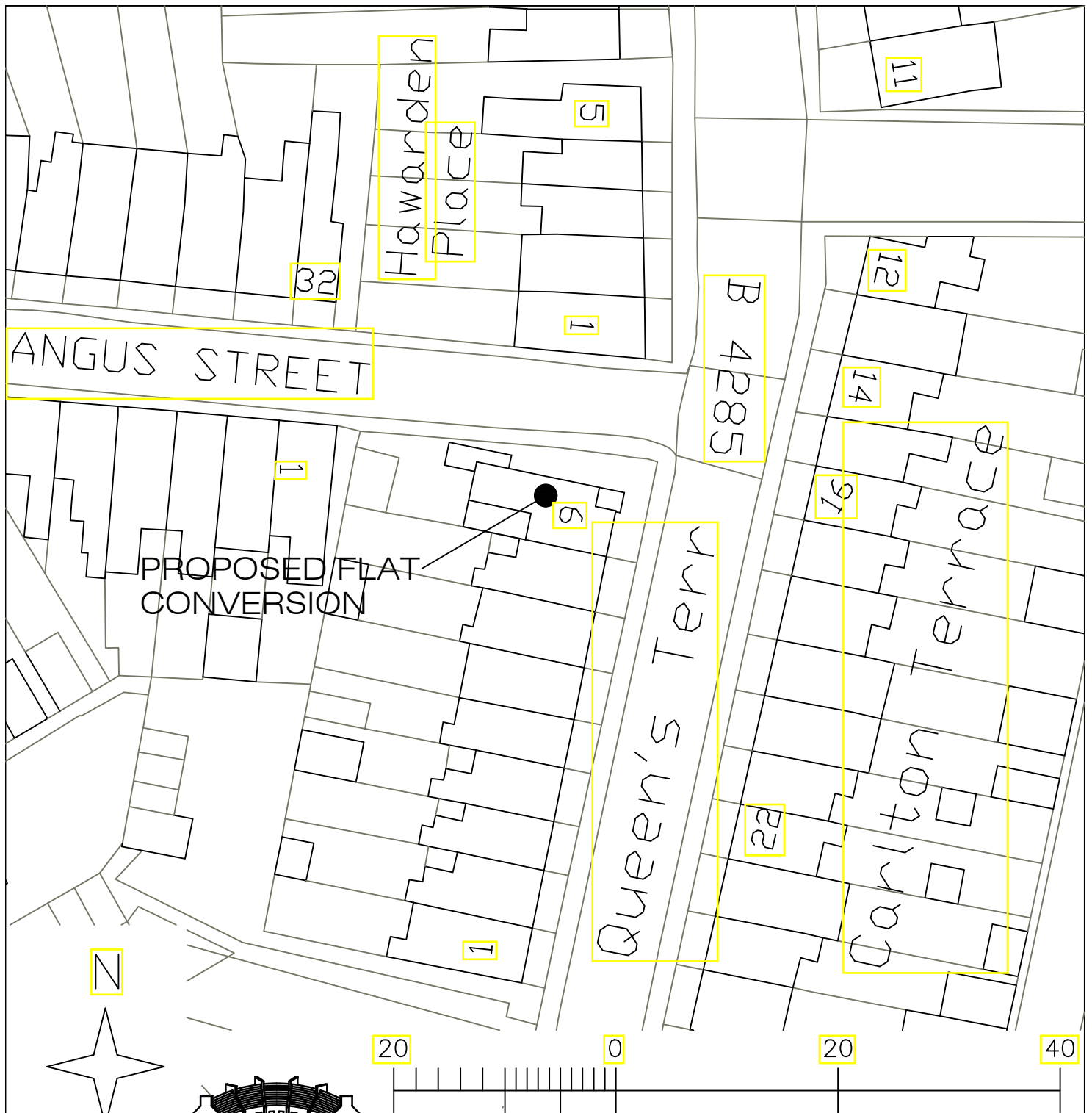
Project
Proposed Flat Conversion at
9 Queens Terrace, Troedyrhiw,
Merthyr Tydfil, CF48 4ER.

Description
PLANNING DRAWING

Scale 1/50 & 1/100 @ A1.	Date November 2020.
Drawn	Checked

Drawing No. PC20/56/1





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Project Proposed Flat Conversion at 9 Queen's Terrace, Troedyrhiw, Merthyr Tydfil, CF48 4ER.	Scale 1/500 @ A4	Date December 2020.
Description SITE PLAN	Drawn	Checked
Drawing No. PC20/56/3		