ASHFIELD
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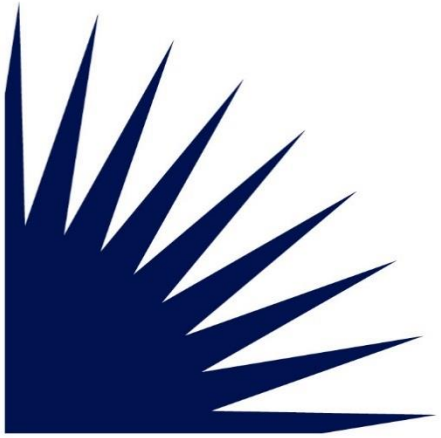
30/11/2020

123220-F01

# Flood Risk Assessment

## Whitchurch House, Ross-on-Wye, HR9 6BZ

Mr Keith Brown trading as Whitchurch House



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| Mr Keith Brown trading as Whitchurch House | Client |

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# Executive Summary

Ashfield Flood Risk Solutions ("Ashfield") was commissioned by Mr Keith Brown trading as Whitchurch House ("the client"), to undertake a Flood Risk Assessment ("FRA") for Whitchurch House, Ross-on-Wye, HR9 6BZ ("the site"). This FRA is required for submission to the client's insurer to outline considerations for a variety of protection measures and products (including resilient materials) and is to include detailed site specific recommendations. A site walkover was undertaken on the 13th November 2020 to inform this FRA.

This FRA has assessed the risk of flooding from all potential sources at the site location and the main source of risk is from the River Wye (100m to the east). The site experienced flooding in February 2020 (Storm Dennis), where the existing flood wall around the perimeter of the care home building was overtopped. Review of Product 4 flood model data provided by the client (via the Environment Agency) against topographic survey levels shows that the wall is at risk of being overtopped between the modelled 1 in 20 year and 1 in 50 year return period (out of those return periods including within the modelling).

By way of flood resistance, this FRA has outlined the maximum levels by which the existing flood wall would need to be raised by, in order to provide the equivalent standard of protection based on modelled flood level data. New works associated with extending the wall would be subject to the limitations of the present foundations, which would need to be confirmed by a structural engineer. If the wall is raised, new flood barriers would need to be provided for each of the three gaps/access points in the flood wall.

Notwithstanding the presence and future raising of the flood wall, it is recommended that various flood resilience measures are considered and implemented, where practical and relevant. Section 3 provides detail on these measures, which includes, but is not limited to, preparing a site specific Flood Action Plan. This should include the roles and responsibilities of staff at the site leading up to and during a flood event. Such measures would include emplacing the demountable flood barriers within the perimeter flood wall and raising/moving any internal vulnerable equipment, informed by the Flood Warning Service (client already registered to this).

Flood risk from all other sources is considered to pose a low – negligible risk and the maintenance and inspection of drainage across the site will ensure that any blockages can be identified at an early stage, thus minimising the residual risk of flooding from surface water/artificial sources.

# 1 Introduction

## 1.1 Authorisation and Context

Ashfield Flood Risk Solutions ("Ashfield") was commissioned by Mr Keith Brown trading as Whitchurch House ("the client"), to undertake a Flood Risk Assessment ("FRA") for Whitchurch House, Ross-on-Wye, HR9 6BZ ("the site"). This FRA is required for submission to the client's insurer to outline considerations for a variety of protection measures and products (including resilient materials) and is to include detailed site specific recommendations with an indication of cost. A site walkover was undertaken on the 13th November 2020 to inform this FRA and observations made during the walkover are referenced throughout, where relevant and photographs included as Appendix A.

## 1.2 Aims and Objectives

The overall aim of this FRA is to assess the risk of fluvial flooding from the nearby River Wye, and to outline appropriate measures for flood resistance and resilience so that flood risk can be managed/mitigated in future. This has been achieved by:

- Reviewing Product 4 flood model data for the River Wye;
- Reviewing flood level data against site topographic survey levels (including crest levels of the existing flood wall that provides perimeter protection); and,
- An enhanced understanding of the property layout and features within.

## 1.3 Information Sources Used

To prepare this FRA, the following information sources and general guidance documents have been used:

- Topographic Survey, Drawing No. (26545ea-01) - Survey Solutions, August 2020;
- Herefordshire Preliminary Flood Risk Assessment (PFRA) – JBA Consulting, May 2011;
- Herefordshire Strategic Flood Risk Assessment (SFRA) - WSP, April 2019;
- Product 4 Environment Agency (EA) Flood Model Data – EA, Ref No. 188299;
- EA Interactive Online Flood Mapping - Accessed November 2020;
- British Geological Survey Drift & Geology Maps - Accessed November 2020.

## 1.4 Report Limitations

This assessment of flood risk has looked to use the most accurate and up to date flood mapping for the location. The site boundary has been supplied by the client and the assessment of risk is based on this.

This report has been prepared with due care and diligence in accordance with industry best practice and guidance. The conclusions in this report are valid only to the extent that the information provided to Ashfield was accurate and complete at time of receipt.

## 1.5 Site Setting

The site is located at coordinates XY: 547145, 179076 (nearest post code HR9 6BZ) and occupies an area of approximately 0.37 hectares (ha). The site currently comprises the care home building within the centre, and main access and parking to the south east. The site is bound to the north by Old Wharf Lane (site access) beyond which is an unnamed watercourse and agricultural field, to the east by a neighbouring residential dwelling, and to the south and west by a camping and hedge puzzle site. The site location can be seen within Drawing 01.

The original building at the site is understood to be from the Georgian era (brick construction), and comprises a suspended floor at the front (northern) and western side elevations. Later extensions (1960s) and the conservatory (circa 10 years ago) comprise solid concrete floors (wall construction is of brick/block).

## 1.6 Topographic Mapping

A site topographic survey had originally been undertaken in February 2007 by Barry Lowe Chartered Land Surveyors (now Battlefield Land Surveys Ltd). This survey was, however, set to an arbitrary grid and not to OS datum. In November 2020, ALT Surveying Ltd visited the site to capture the crest levels of the existing flood wall, and to rotate and align the survey so that the levels were provided in metres above Ordnance Datum (mAOD). This updated survey drawing is included as Appendix B for reference.

The topographic survey shows the site to be fairly flat with levels around the care home building seen to be largely between 22.2mAOD – 22.6mAOD.

## 1.7 Present Flood Mitigation

The site benefits from an external perimeter flood wall to help protect against fluvial flooding from the River Wye. It is understood that this reinforced concrete wall was constructed circa 20 years ago, over two winter periods and the footing is a minimum of 1m below ground level, throughout its length. No drawings were provided by the client to confirm this however. There are three access voids in the flood wall (for which demountable flood barriers are stored on site to emplace between these prior to any predicted flooding). These are located at the front (northern site boundary), side (eastern side where entrance to staff car park is located), and at the rear (to the garden to the south of the building). These are seen in photographs 1-3 respectively in Appendix A and illustrated on Drawing 01. Further reference is made to the flood wall in Section 3. The demountable flood barriers for these access voids are seen in photographs 4-6 of Appendix A.

The demountable flood barriers are of an unknown brand, and it was noted that the seals appear to be coming detached.

The lowest level of the flood wall around the perimeter as seen on the topographic survey is 23.02mAOD (seen in north-west, east/north/east and south-east regions of the wall). As seen in Section 2.1, the current standard of protection offered by this wall is between a 1 in 20 year (5%) and 1 in 50 year (2%) flood event.

In addition to the flood wall, there were a number of identified sumps located on site, within the flood wall perimeter that pumps could be used within, to pump any residual water ingress outside of the wall perimeter. It could not be confirmed during the site walkover if pumps were permanently kept on-site. The locations of these are (and illustrated on Drawing 01):

- Adjacent grass circle to north of site;

- South of building beneath gravel area (photograph 7 of Appendix A);
- Adjacent the staff car park gate (photograph 8 of Appendix A);
- South-east corner of site inside corner of wall (photograph 9 of Appendix A); and,
- Inside south-west corner of wall adjacent patio (photograph 10 of Appendix A).

## 1.8 Local Hydrology

The nearest EA designated Main River is the River Wye, located approximately 100m east of the site, flowing in a southerly direction. An unnamed ordinary watercourse was observed on the walkover on the northern side of Old Wharf Lane (the site's access road immediately to the north). This flows in an easterly direction and discharges into the River Wye to the north of the Church (north-east of the site).

The aforementioned watercourses are illustrated on Drawing 02 for reference.

## 1.9 Drainage

The site's foul drainage generally flows in a southerly direction from the eastern side of the building, before flowing westerly into the foul pump house to the south of the building (photographs 11-12 of Appendix A). There is a connection from the neighbouring dwelling, from the south-east corner of the site. The pump house pumps the foul water to the west away from the site into mains foul drainage.

Surface water drainage is assumed to connect to soakaways.

## 1.10 Historic Flooding

The February 2020 flooding (Storm Dennis) led to the existing flood wall that surrounds the property being overtopped, causing extensive internal flooding of the care home building. Internal depths were estimated to be up to as much as 1m (coach house part of building on eastern side). The equivalent return period of flooding along the River Wye caused by Storm Dennis is not currently known, however, it is estimated that the flooding along the River Taff (55km west of the site) was equivalent to the 1 in 200 year flood event.

There was no sewer flooding at this event and the client stated on the walkover that the foul chamber located within the south-western corner of the site (where connection from neighbouring dwelling is situated, and seen in photograph 13 of Appendix A) was bunged to prevent any floodwaters migrating into the building via the drainage. Ashfield was informed that the impromptu bung was made from large sack filled with earth of sufficient size to block any flood ingress.

Flooding of the site and local area was also noted by the client in 1998, although the internal/external extent and depths are not known.

From review of the EA recorded flood outlines GIS dataset, the site and wider local area is located within the April 1947 flood outline. This was as a result of the channel capacity being exceeded (no raised defences).

# 2 Flood Risk Evaluation

The following sections provide an evaluation of the risk posed by the key flood sources in relation to the site location. Consideration is given to the severity of flood risk to the site as a whole, making use of existing flood mapping, detailed flood model data, high-level local strategic studies and available topographic information.

## 2.1 Fluvial Flood Risk

Fluvial flood risk originates from a watercourse of any size that may affect a site when the channel capacity is exceeded. This type of flooding often occurs following an extreme rainstorm event or a prolonged period of wet weather.

As stated in Section 1.7, the River Wye is located approximately 100m to the east and is the main source of flood risk at a local level to the site.

### EA Mapping & Data

The whole site and wider local area is shown to be located within Flood Zone 3 as illustrated on Drawing 02. This is land assessed as having a 1 in 100 or greater annual probability of river flooding (>1%) in any year.

The Risk of Flooding from Rivers & Sea mapping shows the site to be located within an area of 'high risk'. High risk means that each year this area has a chance of flooding of greater than 3.3%.

The defences along the right bank (site side) of the River Wye to the east, comprise high ground. The EA's open source GIS dataset does not indicate the standard of protection that this high ground offers to the land behind, or any crest levels of the banks.

To inform this FRA, Ashfield has reviewed site specific Product 4 flood model data provided by the client (from the EA). This is included as Appendix C for reference and the data is derived from the River Wye 2012 model. As seen as part of Appendix C, a plan showing in-channel node points is included. The closest node point to the site is directly in line with the site (ref: WYE1507), located approximately 120m to the east.

As discussed in Section 1.7, the lowest top of flood wall level as seen in the topographic survey is 23.02mAOD. If the demountable flood barriers within the flood wall system are emplaced prior to any flooding, this perimeter protection should provide protection against fluvial flooding up to and including the 1 in 20 year (5%) event (maximum flood level of 22.70mAOD).

Out of the return periods modelled within the Product 4 data, it is from the 1 in 50 year (2%) return period that the wall crest level would currently be overtopped, leading to internal flooding. There are no other return periods that have been modelled by the EA to reflect the potential levels for events in between the 1 in 20 year (5%) and the 1 in 50 year (2%). Table 1 below shows the modelled flood levels from node ref: WYE1507 for return periods from the 1 in 50 year event and events of greater magnitude. This table also includes the difference between the present lowest crest level of the flood wall.

Table 1 – Maximum water levels modelled at node ref: WYE1507

| | Return Period | | | | | |
|---|---|---|---|---|---|---|
| | 1 in 50 year | 1 in 75 year | 1 in 100 year | 1 in 100 year +20% CC* | 1 in 200 year | 1 in 1000 year |
| Maximum Water Level (mAOD) | 23.36 | 23.64 | 23.81 | 24.51 | 24.35 | 25.83 |
| Difference in elevation of modelled flood level above flood wall crest level (m) | 0.34 | 0.62 | 0.79 | 1.49 | 1.33 | 2.81 |

*20% CC denotes an additional allowance of 20% on flows to represent future climate change.

The topographic survey also captured the crest level of the neighbours (eastern side) flood wall which is currently part constructed. The crest level of this raised wall was 23.76mAOD (photograph 14 of Appendix A). Comparing this to the flood levels in Table 1, this additional raising would provide protection against fluvial flooding between a 1 in 75 year and a 1 in 100 year event. It is also likely to provide protection against greater return periods between the 1 in 75 year and 1 in 100 year event, based on review of the two modelled flood levels at these events.

The existing flood wall and barrier system is at risk of being overtopped from the 1 in 50 year return period, and events of greater magnitude. Given this and the fact that the barriers require human intervention to prevent any flooding, fluvial flood risk is considered to be **moderate to high**. Further considerations are made within Section 3 of this FRA in relation to further mitigation of fluvial flood risk.

## 2.2 Tidal Flood Risk

Tidal flood risk can affect the coastline as well as estuaries and rivers that are tidally influenced. Flood events often coincide with the tidal regime, high rainfall events or other natural phenomena, which can lead to water levels covering low-lying land or exceeding natural or man-made defences.

The site has an elevation of >20mAOD and furthermore, the River Wye is not considered to be tidally influenced in proximity to the site.

Tidal flood risk is considered to be **negligible** and no further consideration is deemed necessary within this FRA.

## 2.3 Surface Water Flooding

Surface water flooding occurs when local drainage networks are overwhelmed during an extreme rainfall event, causing water to flow over the surface and follow gravity to the lowest point where it often pools. This flood source is increasingly becoming one of the major contributors of flood risk, due to changing weather patterns and increased extreme rainfall events occurring across the UK. This places more pressure than ever on drainage systems, which are often overwhelmed during flash flood events, normally only designed to take between a 1 in 20 and a 1 in 30 return period event.

EA Risk of Flooding from Surface Water mapping can be seen in Drawing 03 and indicates that the entirety of the site is predicted to be at very low risk of flooding from this source. This means that each year this area has a chance of flooding of less than 0.1%. Only the site's access road to the north is shown to be at potential risk from this source. The front entrance at the northern boundary slopes up, providing a natural level of resilience against any residual water ingress onto the site from this region.

As discussed in Section 1.8, surface water drainage at the site is understood to connect to soakaway. If the soakaway(s) and surrounding ground was saturated, there would be a residual risk of surface water flooding.

The overall risk of surface water flooding is considered to be **low**. Further considerations are made within Section 3 of this FRA to ensure risk remains at a low designation.

## 2.4 Reservoir Failure

Assessment of risk of a reservoir failure may be interpreted as the extent of flooding that would occur, should any reservoir that has a capacity larger than 25,000m$^3$, suffer a catastrophic failure. Mapping of this nature is described by the EA as a worst case scenario, with a flood event of this type being extremely unlikely to occur.

The EA Risk of Flooding from Reservoir Failure mapping (Drawing 04) shows the site is partially located within an area that would be subject to flooding in the event of an upstream failure. Such an event is considered to be very unlikely given the legislation that is in place regarding the inspection and maintenance of reservoirs (Reservoirs Act 1975).

Furthermore, the flood wall provides a level of protection against any internal ingress at this event, subject to the flood gates being emplaced.

The risk of flooding from reservoir failure is considered to be **low**. No further considerations of this potential flood source are deemed necessary within this FRA.

## 2.5 Groundwater Flooding

Flooding from a groundwater source often occurs during or following a period of prolonged wet weather within areas that are low lying underlain by permeable rocks (aquifers). When aquifers are at their maximum holding potential, flooding at surface level can occur from beneath the ground.

Groundwater as a sole flooding mechanism is often regarded as low risk, as it often relies on a coinciding rainfall, or flood event from an additional source to become a risk. The main contributory factor that will enhance the risk of groundwater flooding is prolonged periods of high rainfall, which result in the groundwater saturation level rising to the point where it reaches the surface.

Online BGS mapping shows the bedrock geology across the site comprises Brownstones Formation – sandstone, micaceous. This is designated by the EA as a 'Secondary A Aquifer'. This is defined as permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers.

Online BGS mapping shows that the superficial deposit geology that overlays the bedrock at the site to comprise Alluvium – clay, silt, sand and gravel. This is also designated by the EA as a 'Secondary A Aquifer'.

The nearest borehole to the site is BGS Reference: SO51NE1, located approximately 230m to the west. This refers to an electric pump that supplied the house and garden of the adjacent property, with a relative water level of *"12 ft"* (circa 3.6m) down. The geology comprised Alluvium resting on Old Red Sandstone.

Groundwater as an independent source is not considered to pose a significant risk to the site. High water levels within the River Wye would naturally elevate groundwater levels, however any such emergence at the site is considered unlikely given the site's topography in relation to the River Wye.

The main risk here would be due to localised groundwater flow occurring from the pressure differential in a flood scenario if water is one side of the flood wall. It is understood that sump pumps are present to assist in managing this risk, however during a flood scenario, should the pumps fail, the groundwater flood risk would be raised. A risk arises from the difficulty/inability to accurately predict the likely groundwater flow, thus making it difficult to ensure pumps are sized correctly.

Overall, the risk of flooding from groundwater is considered to be **low**. No further considerations of this potential flood source are deemed necessary within this FRA.

## 2.6 Artificial Flood Sources

Flood risk from artificial sources would include the failure of man-made drainage or the water supply network. Although the likelihood of such an occurrence is highly unpredictable, it is recommended that any future proposed designs for the site take into account the location of any existing below ground services, in order to avoid any inadvertent flooding taking place during the construction phase and in the future.

Sewer flooding could pose a risk had the bung not been installed . A site specific drainage plan would form a part of a useful BIM file.

As discussed in Section 1.8, the foul drainage is limited to the site and the neighbouring dwelling, which is then pumped from the pump house on site, away to the west.

There are no historic flood events attributed to sewers or artificial sources referenced within either the PFRA or SFRA. The site is not understood to have previously been affected by flooding from this source.

The risk of flooding from this source is considered to be **low**. Further considerations are made within Section 3 of this FRA to ensure risk remains at a low designation.

# 3 Flood Mitigation

This report has so far outlined all present flood mitigation measures that exist, as well as evaluating all potential flood sources that may affect the property. The following section looks to provide recommendations to enhance the level of flood mitigation afforded at the property.

## 3.1 Flood Risk Summary

The present flood risk status from all reviewed sources are denoted in Table 2. The most notable source of flooding is fluvial, from the River Wye.

Table 2: Flood Risk Summary

| Flood Risk Source | Risk Classification |
|---|---|
| Fluvial | **Moderate to High** |
| Tidal | **Negligible** |
| Surface Water | **Low** |
| Reservoir Failure | **Low** |
| Groundwater | **Low** |
| Artificial Sources | **Low** |

## 3.2 Points of Potential Ingress

Based upon the findings of the site walkover, the following potential points of flood water ingress into the building were identified where the perimeter flood wall would be overtopped:

- Masonry and mortar joints;
- Cracks in external walls;
- Vents and airbricks (photograph 15 of Appendix A);
- Around windows and doors (photographs 16-22 of Appendix A);
- Door thresholds;
- Gaps around pipes that pass-through walls and floors;
- Sanitary appliances caused by back flow from flooded drainage systems;
- From under the floor or foundations; and,
- The weak point where the floor and wall meet.

## 3.3 Future Risk Mitigation

### Flood Resistance

Following the analysis in Section 2.1, Table 3 below sets out by how much the existing flood wall would need to be raised by (maximum), in order to achieve specific levels of protection (to different return periods).

Table 3 – Raising existing flood wall to provide specific standards of protection (based on EA node ref: WYE1507)

| | Return Period | | | | | |
|---|---|---|---|---|---|---|
| | 1 in 50 year | 1 in 75 year | 1 in 100 year | 1 in 100 year +20% CC* | 1 in 200 year | 1 in 1000 year |
| Maximum height existing flood wall would need to be raised by to meet equivalent standard of protection (m) | +0.34 | +0.62 | +0.79 | +1.49 | +1.33 | +2.81 |

It is understood that the neighbouring property is currently undergoing works to raise their flood wall. The topographic survey noted that the new crest level of the neighbouring wall would be 23.76mAOD, which would equate to being approximately 0.73m higher than the present crest height of the client's flood wall. Based upon the flood levels provided within Table 1, the standard of protection that a wall of this height would provide is equivalent to between a 1 in 75 year and 1 in 100 year flood event.

The client should consider the values in Table 3 above, to decide to what return period the future raising of the flood wall will be designed against. New works associated with extending the height of the wall would be subject to the limitations of the present foundations, which would need to be confirmed by a structural engineer. Extending existing flood walls can be undertaken via a range of options, including the use of reinforced concrete, or through the addition of structural glazing panels[1] (MM Engineering), as seen within Figure 1 below. Furthermore, consideration of new flood barriers would be required to account for the raising of the flood wall perimeter to match any increased flood protection levels. It is recommended that any barriers are Kitemarked, FM Approved, or tested to the relevant standard (PAS1188).

Figure 1 – Flood Glazing Panels

Prior to commencing any works to raise the flood protection height of the flood wall, consultation with the EA should be made to ensure that there is no requirement to provide compensatory storage for the loss of storage caused by the improved defences. It is understood that these works would require an Environmental Permit from the EA. If the EA will not approve an Environmental Permit without onerous requirements, then property flood resistance measures could be a consideration.

[1] https://www.mmengineering.co.uk/flood-glass-wall/

Implementation of demountable door barriers along each building entrance as a secondary line of flood defence, should the present flood wall overtop in future is not considered to be a suitable option in this instance. Given that the potential flood depths experienced during such an outcome would be greater than 0.6m, any property level protection may have an adverse effect upon the physical structure of the property, based upon the hydraulic pressure imposed by such depths of flooding. Furthermore, flood barriers are widely known to generally provide protection against flood depths of up to 0.6m. If higher barriers were desired, a Structural Engineer should be consulted.

The sumps located within the walled perimeter should be retained and used to pump away any residual volumes of water ingress that may find its way through small gaps in the flood gated areas, or from the ground via hydrostatic pressure. It is recommended that pumps are stored within the care home building to emplace within these sumps (if not already available). The provision of engine driven pumps should be made should loss of electrical power occur at the site. It is recommended that the sump pumps are automatic with an on/off level float switch. It should be noted that designs for the existing sump chambers have not been seen and thus cannot be reviewed or commented on.

The foul drainage system serving the site currently has no formal flood mitigation measures to prevent any inadvertent flooding via this route. The foul line entering the site from the east should be installed with a penstock, which can be manually or automatically closed prior to flooding external to the site. The foul line leaving the site towards the west should be installed with an automatic non return valve in order to avoid any back surge within the system re-entering the site. It should be noted that formal discussions/permissions may be required with the water authority prior to undertaking a penstock installation.

## Flood Resilience

Flood resilience is a phrase used to describe measures which mean if you are flooded, the damage is less, and you can get back to normal quicker. Flood-resilient buildings are designed and constructed to reduce the impact of flood water entering the building so that no permanent damage is caused, structural integrity is maintained and drying, and cleaning is easier.

The following flood resilience measures should be considered by the client moving forward alongside any external flood mitigation improvement works, which would minimise any disruption caused on site should flooding occur in future. Bearing in mind that the internal renovation works are ongoing, some of the below may not be readily achievable, however, these should be considered in the long term where future renovation is projected. These measures would promote the buildings ability to recover quicker from internal flooding of the building, if for example, the flood wall was ever overtopped in future:

- **Internal Walls:** Promoting the use of Lime Plaster/ water resistant plaster and plasterboard. The anticipated costs of utilising these building methods are between £72 - £120 +VAT per $m^2$;
- **Skirting boards**: There are various options available for skirting boards. Wooden skirting boards can be treated with sealants such as Yacht Varnish to improve their flood resistance, or alternative materials can be used such as Tricoya or Plastic. It is also possible to use a tiled upstand. Industry quoted costs for skirting boards with Tricoya are £60-£90 per metre;
- **Wiring**: Raising of electrical sockets as far up the wall as reasonably practicable and avoiding in low level junction boxes or fuse boards will reduce any water damage to these items;
- **Storage:** The promotion of storing valuables at higher levels within the ground floor to avoid any unnecessary damage;

- **Flooring:** The use of water resistant flooring, which would minimize the time and effort to clean away any flood water. Anticipated final installed cost between £60-£180/$m^2$ (inclusive of VAT);
- **Raise Internal Apparatus:** Where possible, any internal apparatus that is not designed to resist water ingress should be raised (e.g. white goods);
- **Puddle Pump/Wet Vac:** To enable the efficient dewatering of the property, the provision of such items should be kept on site (£280 - £350 +VAT per unit); and,
- **Future Construction:** Where future development is concerned, using construction materials with flood resilient properties as high as practical, such as engineering bricks (Classes A and B). These have 'good' resilience in terms of water penetration, drying ability and retention of pre-flood dimensions and integrity.

## 3.4 Flood Preparedness & Maintenance

Further to any additional works undertaken on site, a formal Flood Action Plan should be compiled which clearly outlines roles and responsibilities in context of preparing for any potential future flooding. This Flood Action Plan would be enacted should a EA flood warning be issued. It has been confirmed that the client is already registered to receive EA flood warnings.

As part of ongoing maintenance at the site, the client should ensure that guttering and downpipes remain clear and free flowing and all drains are clear, to reduce risk of surface water/drainage flooding. Basic maintenance such as keeping masonry pointing in good order and sealing gaps around pipes that penetrate the external walls will also improve flood resilience.

# 4 Conclusion

The site has been assessed for a variety of flood sources, and based upon detailed analysis, this FRA has identified that fluvial flood risk (River Wye) is considered to be the primary source of risk (fluvial risk). Flooding experienced during February 2020 was caused by the overtopping of the external flood mitigation measures that existed. Flood risk from surface water, groundwater, artificial sources and reservoir failure is considered to be low and flood risk from tidal sources considered negligible.

This FRA has assessed the existing flood mitigation measures in place at the site and has outlined how the mitigation of flood risk (namely from the River Wye) can be further improved in the future. This includes primarily, raising the existing flood wall to provide a greater level of protection, subject to the present structural suitability of the existing flood wall. A neighbouring flood defence wall is seen to be raised to provide a standard of protection against a flood event that is the equivalent of between a 1 in 75 year and 1 in 100 year event.

It is important to note that in addition to flood resistance, flood resilience measures are key in improving the site's ability to recover from any residual internal flood water ingress, in the event of the flood wall being overtopped in future. These have been outlined in Section 3.3. In addition to this, the client should prepare a site specific Flood Action Plan that includes details of the roles and responsibilities of all persons working at the care home leading up to a predicted/potential flood event. This would ensure that all necessary measures (including emplacing the flood barriers and raising any vulnerable equipment etc.) can be undertaken so as to mitigate the risk of flooding as much as possible.

# Limitations of the report

This report has been prepared by Ashfield Flood Risk Solutions Limited (Ashfield) for the sole benefit of the client.

This report has been prepared solely for the benefit of the Mr Keith Brown trading as Whitchurch House ("the Client") and has not been assigned to any other third parties. If reliance on this report was required by a third party, this could be arranged for an agreed fee. This report should not be used by the client in relation to any other matters not covered specifically by the scope of the report. If this report does not contain a signature in the Document Control window, then this is an uncontrolled electronic copy and should not be relied upon by the client or any other recipient, as Ashfield cannot give assurances on the source or content of the document. Ashfield has used all reasonable skill, care and diligence in the preparation of this report.

The Flood Risk Assessment report has been designed to satisfy the aim and objectives as outlined in Section 1. It is a desktop review of information provided by the client and from selected private and public databases. It only includes a site investigation where specifically referenced. This report does not make a detailed site-specific assessment of the suitability of the existing drainage on the Site. If this is required, then a site survey should be considered. Ashfield accepts no responsibility for the accuracy or completeness of third party data reviewed within this assessment.

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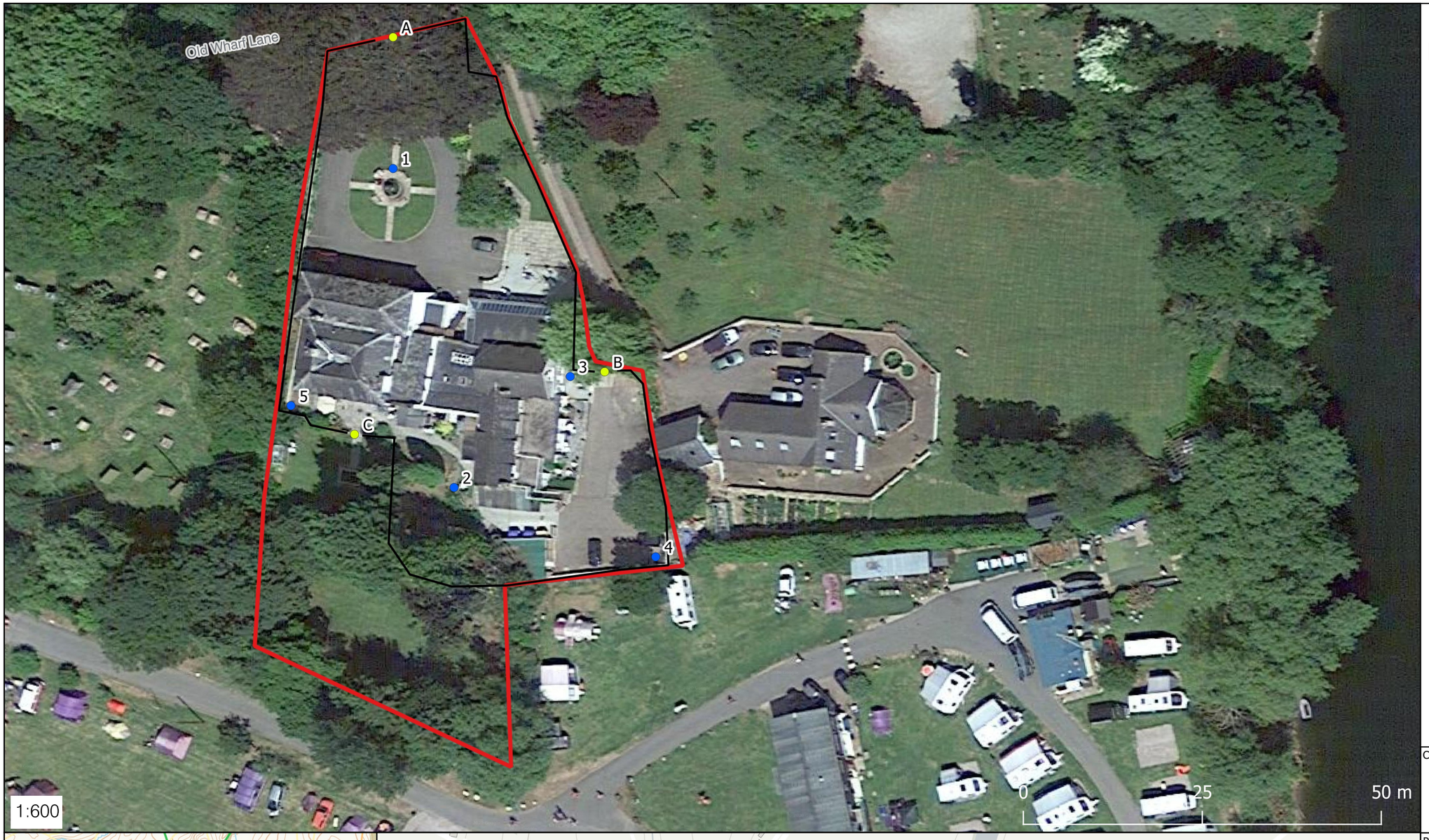
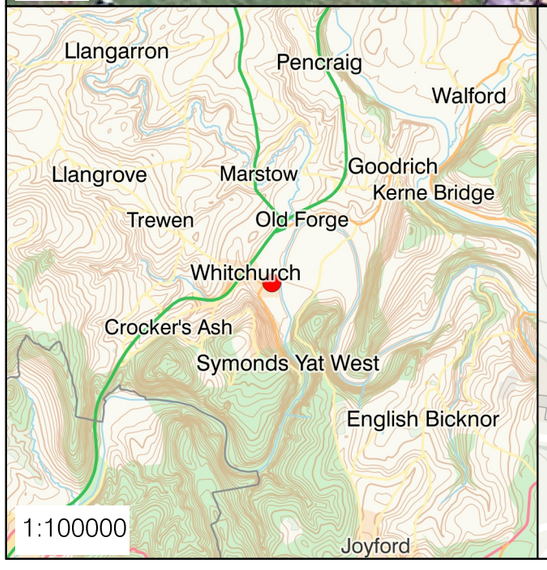
INFO@ASHFIELDSOLUTIONS.COM | +44 (0)845 873 1466

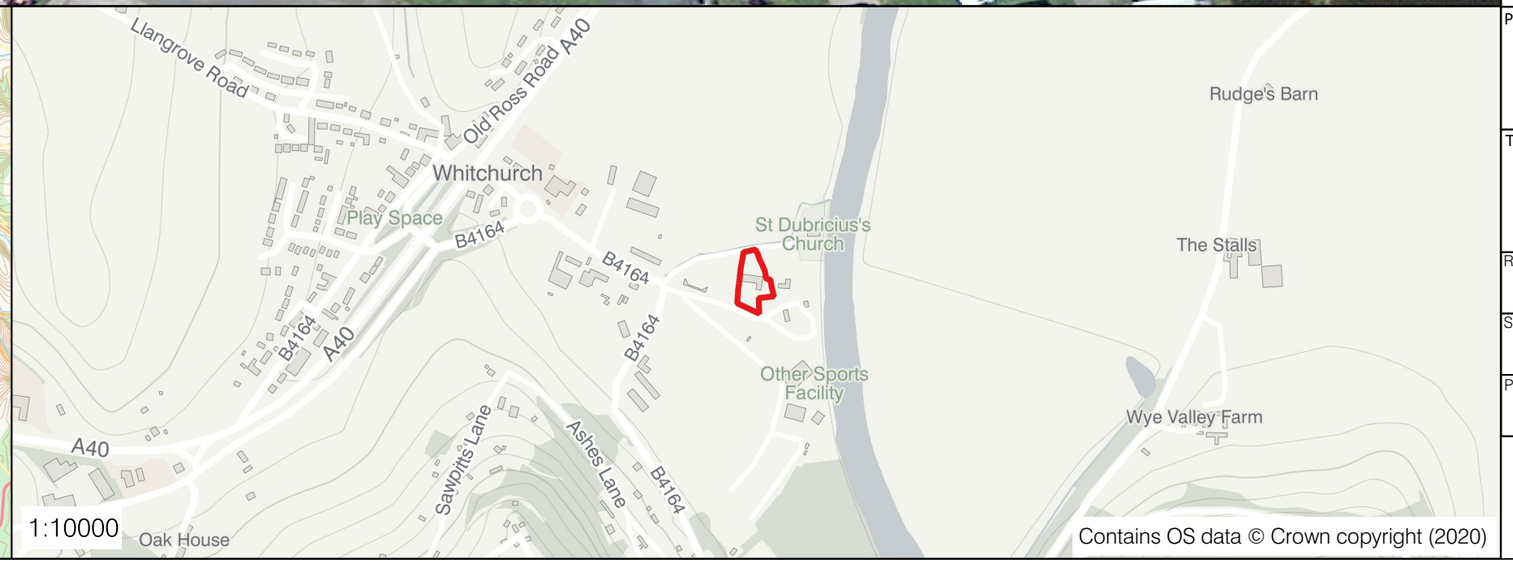
# Drawings




Legend

- Site Boundary
- Site Location
- Flood Wall
- Demountable Flood Barrier Locations
- Sump Locations






Client

Mr Keith Brown trading as Whitchurch House

Project

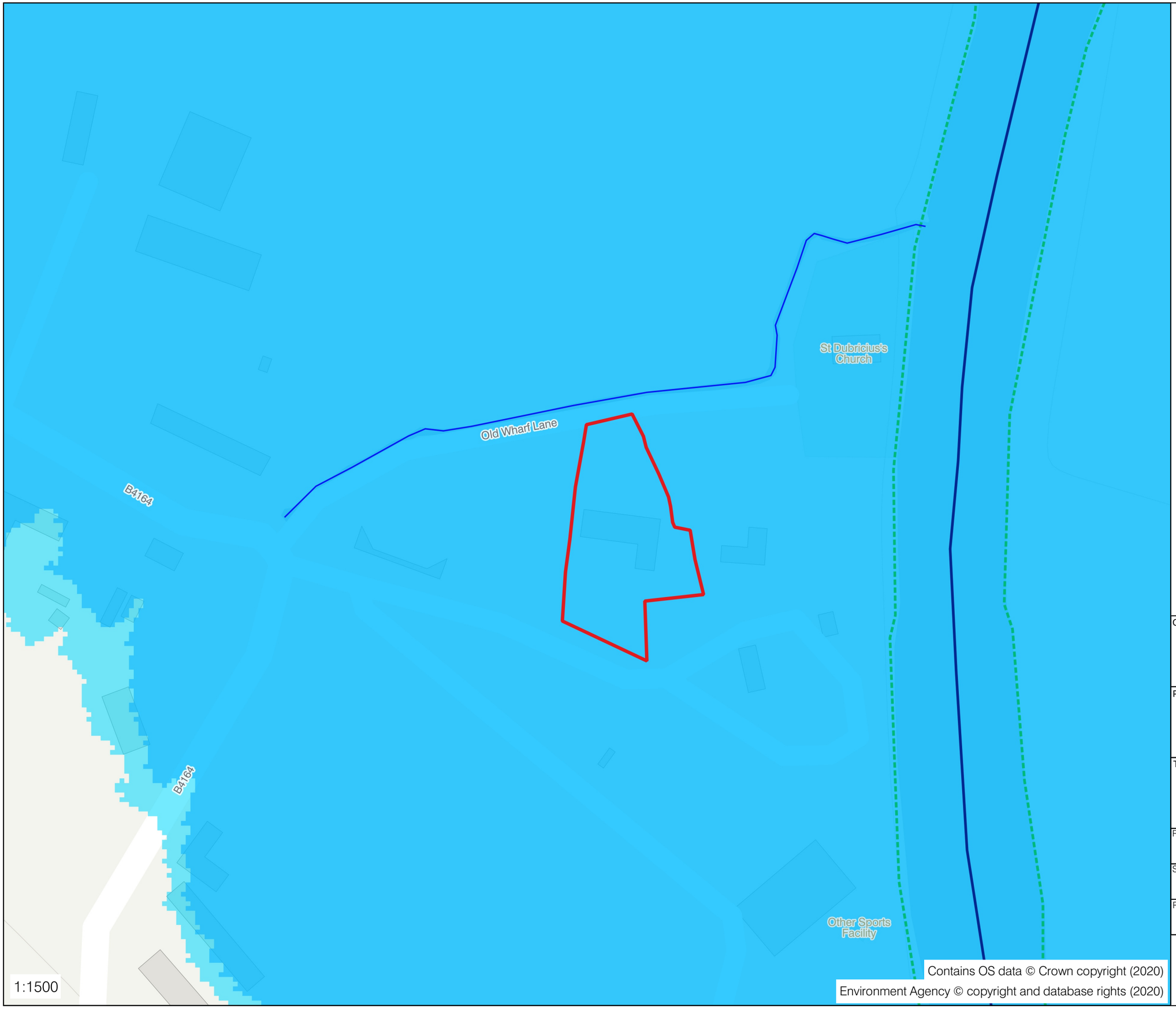
Whitchurch House, Ross-on-Wye, HR9 6BZ

Title

Site Location Plan

| Report No. | Drawing No. | Revision |
|---|---|---|
| 123220-F01 | 01 | - |
| **Scale** | **Date** | **Frame Size** |
| As Shown | 27/11/2020 | A3 |
| **Produced By** | **Drawn By** | **Approved By** |
| JR | JR | AJ |

ASHFIELD FLOOD RISK
SECURING VALUE THROUGH INDEPENDENCE




Legend

- Site Boundary
- Main Rivers
- Unnamed Watercourse
- Flood Defences
- Areas Benefitting from Defences
- Flood Zone 3
- Flood Zone 2



Client

Mr Keith Brown trading as Whitchurch House

Project

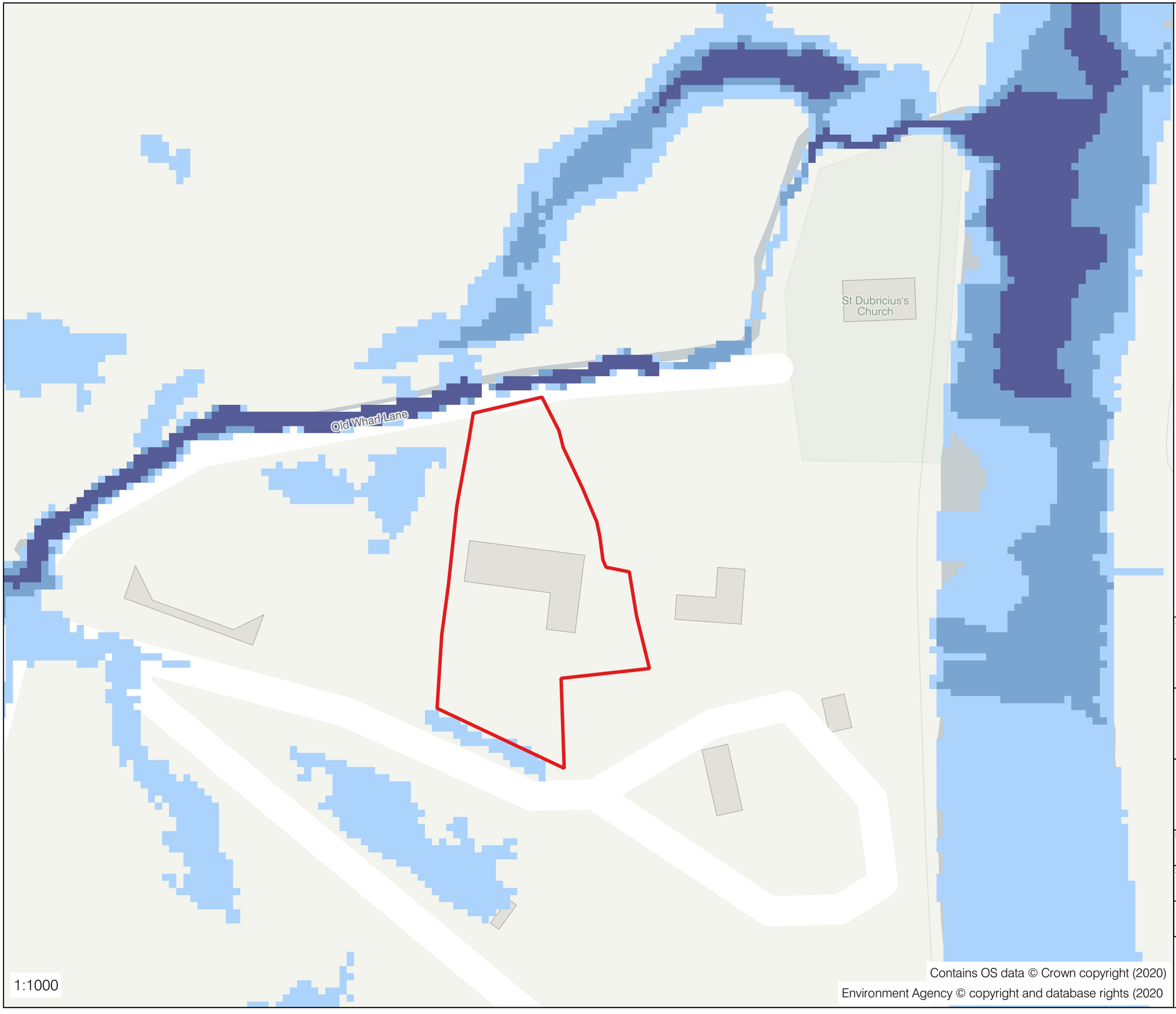
Whitchurch House, Ross-on-Wye, HR9 6BZ

Title

EA Flood Map for Planning

| Report No. | Drawing No. | Revision |
|---|---|---|
| 123220-F01 | 02 | - |
| Scale | Date | Frame Size |
| As Shown | 27/11/2020 | A3 |
| Produced By | Drawn By | Approved By |
| JR | JR | AJ |

ASHFIELD FLOOD RISK
SECURING VALUE THROUGH INDEPENDENCE




Legend

- Site Boundary
- High Risk - 1 in 30 Year Extent
- Medium Risk - 1 in 100 Year Extent
- Low Risk - 1 in 1000 Year Extent



Client

Mr Keith Brown trading as Whitchurch House

Project

Whitchurch House, Ross-on-Wye, HR9 6BZ

Title

Risk of Flooding from Surface Water

| Report No. | Drawing No. | Revision |
|---|---|---|
| 123220-F01 | 03 | - |
| **Scale** | **Date** | **Frame Size** |
| As Shown | 27/11/2020 | A3 |
| **Produced By** | **Drawn By** | **Approved By** |
| JR | JR | AJ |

ASHFIELD FLOOD RISK
SECURING VALUE THROUGH INDEPENDENCE


Legend

- Site Boundary
- Risk of Flooding from Reservoir Failure



Client

Mr Keith Brown trading as Whitchurch House

Project

Whitchurch House, Ross-on-Wye, HR9 6BZ

Title

Risk of Flooding from Reservoir Failure

| Report No. | Drawing No. | Revision |
|---|---|---|
| 123220-F01 | 04 | - |
| **Scale** | **Date** | **Frame Size** |
| As Shown | 27/11/2020 | A3 |
| **Produced By** | **Drawn By** | **Approved By** |
| JR | JR | AJ |

ASHFIELD FLOOD RISK
SECURING VALUE THROUGH INDEPENDENCE

# Appendices

# Appendix A

## Photoblock

1

2

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1. Front side gated part of flood wall.
2. Eastern side gated part of flood wall, entrance to staff car park.
3. Rear side gated part of flood wall.
4. Flood gates for front entrance.
5. Flood gates for side entrance.
6. Flood gates for rear side to garden.

Client: **Mr Keith Brown trading as Whitchurch House**
Site Photographs Taken on: **13/11/2020**
Site: **Whitchurch House, Ross on Wye**

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7. Sump at rear of building.
8. Sump at eastern side of building.
9. Sump at south-east corner of site.
10. Sump inside south-west corner of wall.
11. Foul pump house.
12. Foul pump house

Client: **Mr Keith Brown trading as Whitchurch House**
Site Photographs Taken on: **13/11/2020**
Site: **Whitchurch House, Ross on Wye**

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13. Foul manhole from neighbouring dwelling (south-east corner of site).
14. Site flood wall seen to left of image, neighbouring raised wall seen to right.
15. Airbrick/vent on front elevation.
16. Front door.
17. Conservatory doors.
18. Door entrance behind steps on northern elevation.

Client: **Mr Keith Brown trading as Whitchurch House**
Site Photographs Taken on: **13/11/2020**
Site: **Whitchurch House, Ross on Wye**

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19. Door on eastern elevation.
20. Door on eastern elevation.
21. Door on rear elevation.
22. Door on western elevation.

Client: **Mr Keith Brown trading as Whitchurch House**
Site Photographs Taken on: **13/11/2020**
Site: **Whitchurch House, Ross on Wye**

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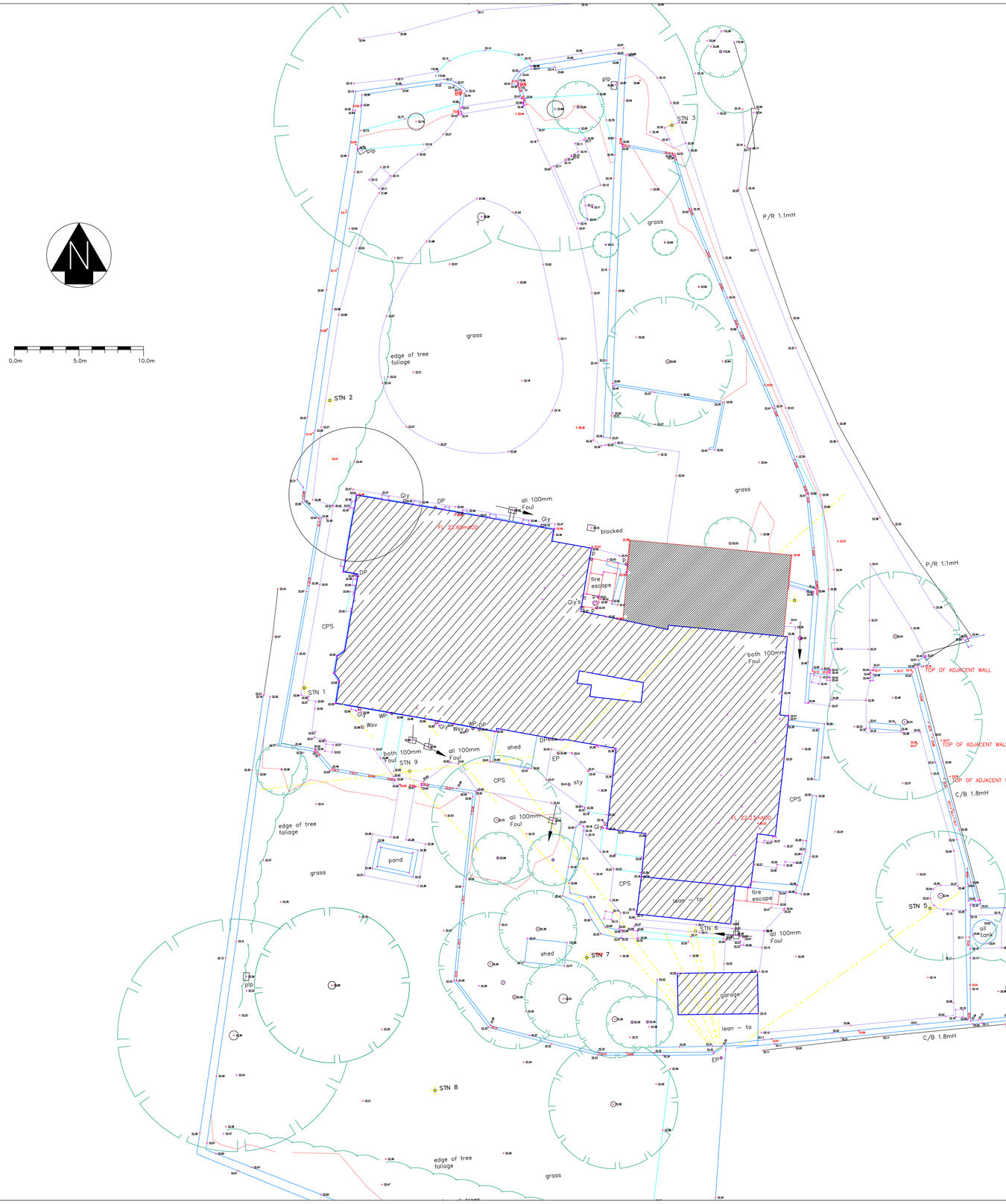
# Appendix B

## Topographic Survey




Notes

| Issue | Description | Auth. | Ckd. | Appd. | Date |
|---|---|---|---|---|---|
| 1 | FIRST ISSUE | AA | | | 11-20 |

CAD Ref: V1

Client: ASHFIELD SOLUTIONS

Project: WHITCHURCH HOUSE
ROSS ON WYE

Title: LEVEL SURVEY
TRANSFORMATION

Scale (A0): 1:125

Datum: NEWLYN

ALT Surveying

Project Code:

Drawing No.: 162647

Issue: 1

# Appendix C

## Environment Agency Product 4 Data

# Flood Risk and Coastal Change

## Climate Change allowances for planning (SHWG area)

March 2016
(Sept 2020 update)

The National Planning Practice Guidance refers to Environment Agency guidance on considering climate change in planning decisions which is available online: https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances

This has been updated and replaces the September 2013 guidance.

It should be used to help planners, developers and advisors implement the National Planning Policy Framework (NPPF)'s policies and practice guidance on flood risk. It will help inform Flood Risk Assessments (FRA's) for planning applications, local plans, neighbourhood plans and other projects.

### Fluvial flooding – peak river flows

Table 1 of the guidance advises that an allowance should be added to 'peak river flows' to account for 'climate change' which should be specific to a river basin district catchment.

In Shropshire, Herefordshire, Worcestershire and Gloucestershire area, we would refer you to the relevant extract from Table 1 below. This outlines the **'peak river flows'** within the 'Severn River Basin District', and specifies the range of percentage allowances to reflect individual development's lifetime and vulnerability. For example, residential would be 100 years (so 2070-2115).

Table 1 Extract

| Severn Peak River Flows: Total potential change anticipated | 2015-39 | 2040-2069 (less vulnerable) | 2070-2115 (more vulnerable) |
|---|---|---|---|
| Upper end | 25% | 40% | 70% |
| Higher central | 15% | 25% | 35% |
| Central | 10% | 20% | 25% |

### Sea Level rise allowances

Table 3 of the guidance (extract below) indicates that net sea level risk is as follows (updated from the 2013 version).

| Area of England | Allowance | 2000 to 2035 (mm) | 2036 to 2065 (mm) | 2066 to 2095 (mm) | 2096 to 2125 (mm) | Cumulative rise 2000 to 2125 (metres) |
|---|---|---|---|---|---|---|
| South West | Higher central | 5.8 (203) | 8.8 (264) | 11.7 (351) | 13.1 (393) | 1.21 |
| South West | Upper end | 7 (245) | 11.4 (342) | 16 (480) | 18.4 (552) | 1.62 |

**Note - For sites utilising the Severn tidal model the above allowances should be considered and applied. As of August 2020, specific updated flood level data is now available for the 2096 to 2125 epoch based upon the Environment Agency's**

**Tidal Severn model within the West Midlands area and will be provided where relevant as part of our Request For Information service; contact Enquiries_Westmids@environment-agency.gov.uk**

## Flood Risk Assessment considerations:

The design flood (1% flood level fluvial, or 0.5% tidal, plus climate change allowance) should be used to inform the sequential test, including appropriate location of built development; consideration of flood risk impacts, mitigation/enhancement and ensure 'safe' development.

### Vulnerability classification

– Development classed as 'Essential Infrastructure' (as defined within Table 2 - Flood Risk Vulnerability Classification, Paragraph: 066 Reference ID: 7-066-20140306 of the NPPG) should be designed to the 'upper end' climate change allowance (70%).

– For highly vulnerable or more vulnerable development e.g. housing, the FRA should use the 'higher central' climate change allowance (35%), as a minimum, to inform built in resilience; but aim to incorporate managed adaptive approaches/measures for the 'upper end' allowance (70%) where feasible.

– For water compatible or less vulnerable development e.g. commercial, the FRA should use the 'central' climate change allowance (20%), as a minimum, to inform built in resilience; but aim to incorporate managed adaptive approaches/measures for the 'higher central' allowance (25%) where feasible.

### Modelling approach

– Major Development:

For 'major' development (as defined within The Town and Country Planning Development Management Procedure (England) Order 2015)*, see definition note below, we would expect a detailed FRA to provide an appropriate assessment (hydraulic model) of the 1% with relevant climate change ranges.

There are two options:

Scenario 1 - Produce a model and incorporate relevant climate change allowances in Table 1.

Scenario 2 - Re-run an existing model and incorporate relevant climate change allowances in Table 1.

– Non Major Development:

For 'non major' development, we would advise that a model is produced or existing model is re-run, similar to the above approach (Scenario 1 and 2). This would give a greater degree of certainty on the design flood extent to inform a safe development.

However, for 'non major' development only, in the absence of modelled climate change information it may be reasonable to utilise an alternative approach. To assist applicants and Local Planning Authorities we have provided some 'nominal' climate change allowances within the 'Table of nominal allowances' below. These should be considered as appropriate within any FRA. There are three additional options:

Scenario 3 - Where previous modelled data (for a variety of return periods) is available, you could interpolate your own climate change figure (see note iv below).

Scenario 4 - Where the 1% level is available from an existing model add on the relevant 'nominal climate change allowance' provided in the 'Table of nominal allowances' below.

Scenario 5 - Establish the 1% level, for example using topographical levels (including LiDAR) and assessment of watercourse flow and nature and then add on the relevant 'nominal climate change allowances' provided in the 'Table of nominal allowances' below.

*Note: For definitions of 'major' development see 'Interpretation 2.—(1)', on page 5, at:
www.legislation.gov.uk/uksi/2015/595/pdfs/uksi_20150595_en.pdf

**Table of Nominal Allowances**

| Watercourse | 20% - 25% | 35% - 40% | 70% |
|---|---|---|---|
| Upper Severn | 600mm | 850mm | 1500mm |
| River Wye | | | |
| River Teme | | | |
| | | | |
| River Avon | 400mm | 600mm | 1000mm |
| | | | |
| Lower Severn | 400mm | 600mm | 1000mm |
| | | | |
| Tributaries and 'ordinary watercourses' | 200mm | 300mm | 500mm |

Notes to above:-

(i) Watercourse definition:
The "Upper Severn"/"Lower Severn" boundary is taken as Lincomb Weir, Worcestershire (national grid reference SO8196869458).

An 'Ordinary Watercourse' is a watercourse that does not form part of a main river. Main Rivers are indicated on our Flood Map. You can also check the classification of the watercourse with the LLFA, some of which have produced Drainage and Flooding Interactive Maps.

(ii) Where a site is near the confluence of two, or more, watercourses, the FRA should use the larger river climate change allowances.

(iii) We may hold more precise information for some of the "tributaries". We would recommend that you seek this information from us via a 'pre-planning enquiry/data request', to the email address below.

(iv) We would also recommend that you contact us for our modelled '20%' allowances and associated flow data. This is available for some rivers. This data may help inform a more detailed climate change analysis (where necessary), including any interpolation of levels or flow to create a 'stage discharge rating' in order to estimate the required percentage; or be of assistance to inform 'less vulnerable' or 'water compatible' development proposals.

IMPORTANT NOTE
Please note the nominal climate change allowances are provided as a pragmatic approach, for consideration, in the absence of a modelled flood level and the applicant undertaking a detailed model of the watercourse. Use of nominal climate change allowances are not provided/ recommended as a preference to detailed modelling and historical data.

The Local Planning Authority may hold data within their Strategic Flood Risk Assessment (SFRA), or any future updates, which may help inform the above.

FREEBOARD NOTE
It is advised that Finished Floor Levels should be set no lower than '600mm' above the 1% river flood level plus climate change. Flood proofing techniques might be considered where floor levels cannot be raised (where appropriate). This 600mm freeboard takes into account any uncertainties in modelling/flood levels and wave action (or storm surge effects).

## Surface Water

Table 2 of the guidance also indicates the relevant increases that surface water FRA should consider for an increase in peak rainfall intensity.

The following table is for **'peak rainfall intensity'** allowance in small and urban catchments. Please note that **surface water (peak rainfall intensity) climate change allowances should be discussed with the Lead Local Flood Authority (LLFA).**

| Peak Rainfall Intensity - Applies across all of England | Total potential change anticipated for 2010-2039 | Total potential change anticipated for 2040-2069 | Total potential change anticipated for 2070-2115 |
|---|---|---|---|
| Upper end | 10% | 20% | 40% |
| Central | 5% | 10% | 20% |

Note to above:-

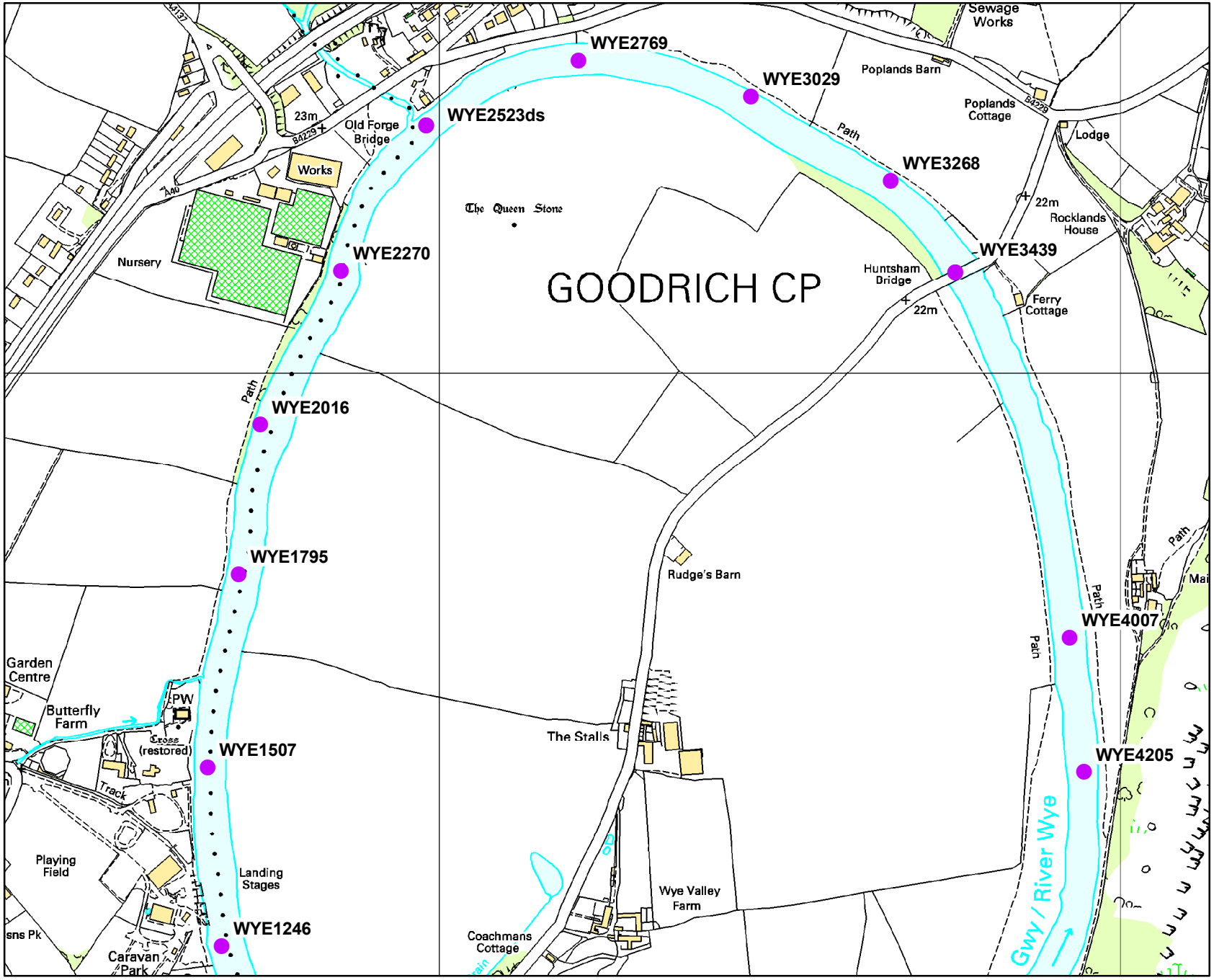
For river catchments around or over 5 square kilometres, the peak river flow allowances are appropriate.

**Produced by: WestMidsPlanning@environment-agency.gov.uk**

West Midlands Area -

Shropshire, Herefordshire, Worcestershire and Gloucestershire Sustainable Places Team.

# River Wye Model Node Point Map centred on HR9 6BZ created 19/10/2020 [our ref. 188299]




Environment Agency

1: 8000

N
W E
S

## Legend

- River Wye Model Node Point



**Contact Us:** National Customer Contact Centre, PO Box 544, Rotherham, S60 1BY. Tel: 03708 506 506 (Mon-Fri 8-6). Email: enquiries@environment-agency.gov.uk

# **Product 4 (Detailed Flood Risk Data)** for Whitchurch House, Ross-on-Wye, HR9 6BZ

**Reference number:** 188299
**Date of issue**: 01 December 2020

## Model Information

The following information and attached maps contain a summary of the modelled information relevant to the area of interest. The information provided is based on the best available data as of the date of issue.

| Model Name | Release Date |
|---|---|
| River Wye | 2012 |

## Flood Map for Planning (Rivers and Sea)

The Flood Map for Planning (Rivers and Sea) indicates the area at risk of flooding, **assuming no flood defences exist**, for a flood event with a 0.5% chance of occurring in any year for flooding from the sea, or a 1% chance of occurring in any year for fluvial (river) flooding (Flood Zone 3). It also shows the extent of the Extreme Flood Outlines (Flood Zone 2) which represents the extent of a flood event with a 0.1% chance of occurring in any year, or the highest recorded historic extent if greater. The Flood Zones refer to the land at risk of flooding and **do not** refer to individual properties. It is possible for properties to be built at a level above the floodplain but still fall within the risk area.

This Flood Map only indicates the extent and likelihood of flooding from rivers or the sea. It should also be remembered that flooding may occur from other sources such as surface water, sewers, road drainage, etc.

To find out which flood zone a location is in please use: https://flood-map-for-planning.service.gov.uk/

## Definition of flood zones

- **Zone 1** - The area is within the lowest probability of flooding from rivers and the sea, where the chance of flooding in any one year is less than 0.1% (i.e. a 1000 to 1 chance).

- **Zone 2** - The area which falls between the extent of a flood with an annual probability of 0.1% (i.e. a 1000 to 1 chance) fluvial and tidal, or greatest recorded historic flood, whichever is greater, and the extent of a flood with an annual probability of 1% (i.e. a 100 to 1 chance) fluvial / 0.5% (i.e. a 200 to 1 chance) tidal. (Land shown in light blue on the Flood Map).
- **Zone 3** - The chance of flooding in any one year is greater than or equal to 1% (i.e. a 100 to 1 chance) for river flooding and greater than or equal to 0.5% (i.e. a 200 to 1 chance) for coastal and tidal flooding.

Note: The Flood Zones shown on the Environment Agency's Flood Map for Planning (Rivers and Sea) do not take account of the possible impacts of climate change and consequent changes in the future probability of flooding. Reference should therefore also be made to the Strategic Flood Risk Assessment when considering location and potential future flood risks to developments and land uses.

## Areas Benefitting From Defences

Where possible we show the areas that benefit from the flood defences, in the event of flooding:

- from rivers with a 1% (1 in 100) chance in any given year, or;
- from the sea with a 0.5% (1 in 200) chance in any given year.

If the defences were not there, these areas would flood. Please note that we do not show all areas that benefit from flood defences.

The associated Dataset is available here: https://data.gov.uk/dataset/flood-map-for-planning-rivers-and-sea-areas-benefiting-from-defences

## Node Data/ Modelled Levels

The attached map will show a selection of 1D model node points near to your site. The fluvial levels for these node points are shown below.

### Fluvial Flood Levels (m AOD)

The modelled levels are given in m AOD (N), m AOD indicates metres Above Ordnance Datum (Newlyn).

The information is taken from the model referenced above and does not include the updated climate change figures.

| | | | Annual Exceedance Probability - Maximum Water Levels (m AOD) (defended) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Node Label** | **Easting** | **Northing** | **50% (1 in 2)** | **20% (1 in 5)** | **10% (1 in 10)** | **5% (1 in 20)** | **2% (1 in 50)** | **1.33% (1 in 75)** | **1% (1 in 100)** | **1% (1 in 100) inc. 20% increase in inflows** | **0.5% (1 in 200)** | **0.1% (1 in 1000)** |
| WYE4205 | 356947 | 217415 | 22.39 | 22.89 | 23.08 | 23.30 | 23.80 | 24.03 | 24.18 | 24.79 | 24.64 | 25.99 |
| WYE4007 | 356926 | 217611 | 22.24 | 22.73 | 22.91 | 23.14 | 23.66 | 23.90 | 24.05 | 24.68 | 24.53 | 25.91 |
| WYE3439 | 356758 | 218148 | 22.04 | 22.58 | 22.79 | 23.04 | 23.60 | 23.85 | 24.01 | 24.66 | 24.51 | 25.93 |
| WYE3268 | 356663 | 218282 | 21.98 | 22.53 | 22.74 | 23.00 | 23.55 | 23.80 | 23.96 | 24.62 | 24.46 | 25.89 |
| WYE3029 | 356458 | 218406 | 21.88 | 22.46 | 22.68 | 22.95 | 23.52 | 23.77 | 23.93 | 24.60 | 24.44 | 25.88 |
| WYE2769 | 356205 | 218459 | 21.73 | 22.36 | 22.61 | 22.89 | 23.48 | 23.74 | 23.90 | 24.58 | 24.42 | 25.87 |
| WYE2523ds | 355981 | 21864 | 21.59 | 22.29 | 22.55 | 22.85 | 23.45 | 23.72 | 23.88 | 24.57 | 24.41 | 25.86 |
| WYE2270 | 355856 | 218151 | 21.45 | 22.22 | 22.49 | 22.80 | 23.42 | 23.69 | 23.86 | 24.55 | 24.39 | 25.85 |
| WYE2016 | 355737 | 217924 | 21.31 | 22.15 | 22.44 | 22.76 | 23.39 | 23.67 | 23.84 | 24.53 | 24.37 | 25.84 |
| WYE1795 | 355705 | 217705 | 21.20 | 22.10 | 22.40 | 22.73 | 23.38 | 23.65 | 23.83 | 24.52 | 24.36 | 25.84 |
| WYE1507 | 355660 | 217421 | 21.20 | 22.06 | 22.37 | 22.70 | 23.36 | 23.64 | 23.81 | 24.51 | 24.35 | 25.83 |
| WYE1246 | 355680 | 217160 | 21.12 | 22.02 | 22.33 | 22.67 | 23.34 | 23.62 | 23.79 | 24.50 | 24.33 | 25.82 |

## Modelled Flood Extents

Available modelled flood outlines produced as part of the detailed modelling have been provided to you in GIS format. These show modelled flood extents, not/taking into account flood defences. Climate change will increase flood risk due to overtopping of defences.

**https://ea.sharefile.com/d-s198d121d0a842159**

## Climate Change

The 'Flood Risk Assessments: Climate Change Allowances' are published on gov.uk. This is in replacement of previous climate change allowances for planning applications. The data provided in this product does not include the new allowances. You will need to consider this data and factor in the new allowances to demonstrate the development will be safe from flooding. The climate change factors are now more complex and a single uplift percentage across England cannot be justified.

The Environment Agency will incorporate the new allowances into future modelling studies. For now it remains the applicant's responsibility to demonstrate through their proposal and flood risk assessments that new developments will be safe in flood risk terms for its lifetime.

## Recorded Flood Outlines

Following an examination of our records of historical flooding we do hold records of flooding for this area, please find tabulated information below for these recorded flood events.

| Flood Event Date | Source of Flooding | Cause of Flooding |
|---|---|---|
| April 1947 | River Wye | Channel capacity exceeded (no raised defences) |

The corresponding recorded flood outline/s can be accessed here:
https://data.gov.uk/dataset/recorded-flood-outlines1

The Recorded Flood Outlines take into account the presence of defences, structures, and other infrastructure where they existed at the time of flooding. It includes flood extents that may have been affected by overtopping, breaches or blockages. Any flood extents shown do not necessarily indicate that properties were flooded internally. It is also possible that the pattern of flooding in this area has changed and that this area would now flood or not flood under different circumstances.

Please note that our records are not comprehensive and that the map is an indicative outline of areas which have previously flooded, not all properties within this area will have flooded. It is possible that other flooding may have occurred that we do not have records for.

You may also wish to contact your Local Authority or Internal Drainage Board (where relevant), to see if they have other relevant local flood information.

## Flood Defences

Flood defences do not completely remove the chance of flooding. They can be overtopped by water levels which exceed the capacity of the defences.

If flood defences are located in your area, you can access this data here:
https://data.gov.uk/dataset/spatial-flood-defences-including-standardised-attributes

## Planning developments

If you have requested this information to help inform a development proposal, then you should note the information on GOV.UK on the use of Environment Agency Information for Flood Risk Assessments. You can also request pre application advice:

https://www.gov.uk/planning-applications-assessing-flood-risk
https://www.gov.uk/government/publications/pre-planning-application-enquiry-form-preliminary-opinion

## Supporting Information

### Surface Water

Managing the risk of flooding from surface water is the responsibility of Lead Local Flood Authorities. The 'risk of flooding from surface water' map has been produced by the Environment Agency on behalf of government, using information and input from Lead Local Flood Authorities.

You may wish to contact your Local Authority who may be able to provide further detailed information on surface water.

It is not possible to say for certain what the flood risk is but we use the best information available to provide an indication so that people can make informed choices about living with or managing the risks. The information we supply does not provide an indicator of flood risk at an individual site level. Further information can be found on the Agency's website:

https://flood-warning-information.service.gov.uk/long-term-flood-risk

### Flood Risk from Reservoirs

The Flood Risk from Reservoirs map can be found on the Long Term Flood Risk Information website:

https://flood-warning-information.service.gov.uk/long-term-flood-risk/map?map=Reservoirs

**Flood Alert & Flood Warning Area**

We issue flood alert/warnings to specific areas when flooding is expected. If you receive a flood warning you should take immediate action.

You can check whether you are in a Flood Alert/Warning Area and register online using the links below:

https://www.gov.uk/check-flood-risk

https://www.gov.uk/sign-up-for-flood-warnings

If you would prefer to register by telephone, or if you need help during the registration process, please call Floodline on 0345 988 1188.

The associated dataset for flood warning areas is available here: https://data.gov.uk/dataset/flood-warning-areas3

The associated dataset for flood alert areas is available here: https://data.gov.uk/dataset/flood-alert-areas2

**Flood Risk Activity Permits**

We now consider applications for works, which may be Flood Risk Activities, under Environmental Permitting Regulations. This replaces the process of applying for a Flood Defence Consent. You may need an environmental Permit for flood risk activities if you want to do work:

- in, under, over or near a main river (including where the river is in a culvert)
- on or near a flood defence on a main river
- in the flood plain of a main river
- on or near a sea defence

Please go to this website to find out more about how to apply: https://www.gov.uk/guidance/flood-risk-activities-environmental-permits.
Please be aware that Bespoke and Standard Rules permits can take up to 2 months to determine and will incur a charge.

Further details about the Environment Agency information supplied can be found on the GOV.UK website:

https://www.gov.uk/browse/environment-countryside/flooding-extreme-weather

Email: Enquiries_Westmids@environment-agency.gov.uk
Website: www.gov.uk/government/organisations/environment-agency