HYDROGEO
Groundwater and Environment

Flood Consequence Assessment

Proposed Velo Park, Llanfoist, Abergavenny

On Behalf of

Owen Davies Consulting Limited

Quality Management

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1 Introduction

1.1 Background

This Flood Consequence Assessment (FCA) has been prepared by Hydrogeo at the request of Owen Davies Consulting to support a planning application for the proposed development of Abergavenny Velo Park, Llanfoist, Abergavenny, NP7 9HE.

This FCA has been carried out in accordance with guidance contained in Technical Advice Note 15 Development and Flood Risk (TAN15)[1] and associated Development Advice Maps. This FCA identifies and assesses the risks of all forms of flooding to and from the development and demonstrates how these flood risks will be managed so that the development remains safe throughout the lifetime, taking climate change into account.

It is recognised that developments which are designed without regard to flood risk may endanger lives, damage property, cause disruption to the wider community, damage the environment, be difficult to insure and require additional expense on remedial works. The development design should be such that future users will not have difficulty obtaining insurance or mortgage finance, or in selling all or part of the development, as a result of flood risk issues.

1.2 Technical Advice Note 15 (TAN15)

One of the key aims of TAN15 is to ensure that flood risk is taken into account at all stages of the planning process; to avoid inappropriate development in areas at risk of flooding and to direct development away from areas of highest risk.

It advises that where new development is exceptionally necessary in areas of higher risk, this should be safe, without increasing flood risk elsewhere, and where possible, reduce flood risk overall.

A risk-based approach is adopted at stages of the planning process, applying a source pathway receptor model to planning and flood risk. To demonstrate this, an FCA is required and should include:

- whether a proposed development is likely to be affected by current or future flooding from all sources;
- whether it will increase flood risk elsewhere;
- whether the measures proposed to deal with these effects and risks are appropriate; and
- satisfy the justification test, including the acceptability of consequences.

1.3 Report Structure

This FCA has the following report structure:

- Section 2 details the sources of information that have been consulted;
- Section 3 describes the location area and the existing and proposed development;
- Section 4 outlines the flood risk to the existing and proposed development;

- Section 5 outlines the mitigation measures used to reduce the overall level of flood risk;
- Section 6 justifies the location of the development; and
- Section 7 presents a summary and conclusions.

2 Sources of Information

2.1 Discussion with Regulators

Consultation and discussions with the relevant regulators have been undertaken during this FCA including Natural Resources Wales, the Local Planning Authority (LPA), the Lead Local Flood Authority (LLFA) and Sewerage Undertakers.

2.1.1 Natural Resources Wales

The Flood and Water Management Act 2010 gives Natural Resources Wales a strategic overview role for all forms of flooding and coastal erosion. They also have direct responsibility for the prevention, mitigation and remediation of flood damage for main rivers and coastal areas. The Natural Resources Wales is the statutory consultee with regards to flood risk and planning.

Natural Resources Wales Flood Risk Standing Advice and TAN15 have been consulted and reviewed during this FCA. This has confirmed the level of FCA required and that a surface water drainage assessment is to be undertaken. Information regarding the current flood risk at the application site, local flood defences and flood water levels has been obtained from Natural Resources Wales (see Appendix 1).

2.1.2 Monmouthshire County Council

Monmouthshire County Council is the LPA, the LLFA and therefore, has responsibilities for 'local flood risk', which includes surface runoff, groundwater and ordinary watercourses. Planning guidance written by Monmouthshire County Council regarding flood risk was consulted to assess the mitigation policies in place.

The Monmouthshire County Council Strategic Flood Consequence Assessment (SFCA) and the Monmouthshire County Council Preliminary Flood Risk Assessment (PFRA) which cover the site have been reviewed.

2.1.3 Welsh Water/Dŵr Cymru

Welsh Water/Dŵr Cymru is responsible for the disposal of waste water and supply of clean water for this area. Information with regards to sewer and water main flooding contained within the Monmouthshire County Council SFCA and the Monmouthshire County Council PFRA have been consulted as part of this FCA. All Water Companies have a statutory obligation to maintain a register of properties/areas which are at risk of flooding from the public sewerage system, and this is shown on the DG5 Flood Register.

3 Location & Development Description

3.1 Site Location

The site is located at Racecourse Farm, Llanfoist, Abergavenny, NP7 9HE (see Drawing 1). The National Grid Reference (NGR) of the site is SO 29539, 12957.

3.2 Existing Development

The site is currently used for agricultural purposes.

3.3 Proposed Development

The proposal is for a hub, or 'velo park' is proposed with a mix of different cycling facilities built around a core closed road circuit (CRC) for road-based activity, as well as developing opportunities for other forms of cycling e.g. cyclocross, trails, skills, family use (see Appendix 2). Ideally, a national standard CRC facility would be achieved (1.50km length), although as a minimum the facility needs to achieve regional standards (1km) that serves at least a one-hour travel-time catchment area.

3.4 Ground Levels

A topographical survey of the site has recently been undertaken (see Appendix 3). The site rises from east to west, site ground levels are between 45 and 54 metres Above Ordnance Datum (mAOD). The site has a minimum ground level of 45.50mAOD.

3.5 Catchment Hydrology

The River Usk (Main River) flows approximately 300m to the north east of the site. A number of small drainage ditches are located on and within the vicinity of the site.

The River Usk rises on the northern slopes of the Black Mountain, located within the Brecon Beacons National Park, Mid-Wales. The River Usk flows east from its source towards the town of Brecon, then follows a south-easterly course to the town of Abergavenny, before finally turning south towards the city of Newport where it discharges into the Severn Estuary near the Newport Wetlands National Nature Reserve. The River Usk is designated by Natural Resources Wales as a Main River. The River Usk drains a large catchment of approximately 846km^2.

3.6 Drainage

Public combined, foul and surface water sewers are located on and within the vicinity of the site (see Appendix 4).

3.7 Ground Conditions

The British Geological Survey (BGS) Map indicates that superficial deposits are present across the Site and comprise Glaciofluvial Sheet Deposits forming the elevated areas at the Development Area. These are sand and gravel deposits formed by glacial processes in the Quaternary Period, within the last 2 million years. The lower lying eastern areas of the Site are underlain by Alluvial Deposits of clay, silt, sand and gravel deposited by the River Usk.

The bedrock underlying the site consists of the Maughans Formation - Argillaceous Rocks and [subequal/subordinate] Sandstone, Interbedded. Sedimentary Bedrock formed approximately 398 to 416 million years ago in the Devonian Period in a local environment previously dominated by rivers.

The bedrock and superficial geology have been classified as Secondary Aquifers. Secondary Aquifers are described as permeable layers that are capable of supporting water supplies at a local scale. The bedrock geology is permeable rock (aquifer) and the superficial geology can be in hydraulic continuity with the river.

Information from the National Soil Resources Institute details the site area as being situated on freely draining slightly acid loamy soils.

4 Flood Risk

4.1 Sources of Flooding

All sources of flooding have been considered, these are; fluvial (river) flooding, tidal (coastal) flooding, groundwater flooding, surface water (pluvial) flooding, sewer flooding and flooding from artificial drainage systems/infrastructure failure.

4.2 Climate Change

Projections of future climate change, in the UK, indicate more frequent, short-duration, high intensity rainfall and more frequent periods of long duration rainfall. Guidance included within TAN15 recommends that the effects of climate change are incorporated into FCA. Recommended precautionary sensitivity ranges for peak rainfall intensities and peak river flows are outlined in the CL-03-16 - Climate change allowances for Planning purposes.

Table 4-1 show the peak river flow allowances for this river basin district. There is reasonable level of certainty that the future impacts of climate change will lie somewhere between the central and upper allowances. The 9th January 2014 Welsh Government letter to all Chief Planning Officers (CPO) in Wales and CL-03-16 - Climate change allowances for Planning purposes clarifies and refers to the Natural Resources Wales recommendations that the lifetime of development for residential development is 100 years, and for other development it is considered to be 75 years. Therefore, the design flood event for the site is the 1 in 100 year (+25%) event.

Table 4-1 Peak River Flow Allowances (use 1961 to 1990 baseline).

	Total Potential Change Anticipated by the 2020s	**Total Potential Change Anticipated by the 2050s**	**Total Potential Change Anticipated by the 2080s**
Upper end estimate	25%	40%	70%
Central estimate	10%	20%	25%
Lower end estimate	0%	5%	5%

4.3 Historic Flooding

Natural Resources Wales records indicate that a small proportion of the site, to the south, may have flooded during the December 1979 flood event. No information has been received with regards to flood levels, flood depths or the return period of the flood event. The December 1979 flood event was one of the most widespread flood events within this area and across South Wales with more than 7,500 properties being flooded.

The Monmouthshire County Council SFCA states that the 1979 event was the most notable event in Wales over the last forty years and caused the River Usk to overtop its defences. The Monmouthshire County Council SFCA states that the return period of the event is believed to be approximately 1 in 50 years (2% AEP). A comparison of Natural Resources Wales peak flow data for the 1979 event at Chainbridge and Llandetty gauging stations with their respective design flows was undertaken for this FCA. Based on this,

the 1979 event is estimated to have a return period of between a 1 in 75 years (1.3% AEP) and 1 in 200 years (0.5% AEP).

There are no other records of anecdotal information of flooding at the site. The British Hydrological Society "Chronology of British Hydrological Event[2]" has no information on flooding within the vicinity of the site.

A Natural Resources Wales maintained water level gauging station is located at the upstream face of the A465 road bridge just upstream of the site (NGR SO 29975 13067). This gauge was established in 1994 and has a datum of 40.815mAOD. Data records prior to 2008 are of poor quality and cannot be relied on. However, since 2008 Natural Resources Wales has confidence in the quality of the recorded water level data.

Since 2008, the highest stage recorded at the A465 gauge is 5.61m (giving a water level of 46.425mAOD). This peak water level was reached on 16th February 2020 at 09:15am. Analysis of historical records of gauged flow data at stations located at Llandetty (upstream of Llanfoist) and Chainbridge (downstream of Llanfoist) estimate a 1 in 30 year return period for the February 2020 event.

The next highest stage recorded at the A465 gauge is 4.84m (giving a water level of 45.655mAOD). This peak water level was reached on 23rd December 2013 at 11:00pm. Analysis of historical records of gauged flow data at stations located at Llandetty (upstream of Llanfoist) and Chainbridge (downstream of Llanfoist) estimate a 1 in 5 year return period for the December 2013 event.

The site did not flood during the 16th February 2020 or the 23rd December 2013 events however, flooding near to the site did occur. Photographs 4-1 and 4-2 show flooding during the 16th February 2020 event near to the site.

Photograph 4-1 16th February 2020 Event Flooding near to Racecourse Farm.

Photograph 4-2 16th February 2020 Event Flooding along the eastern site boundary.

4.4 Existing and Planned Flood Defence Measures

Natural Resources Wales do not maintain any flood defences within 1km of the site, flood defences on this stretch of the River Usk are privately owned. However, there is currently no further information available in relation to these privately owned defences. Further risk management measures will be used to protect the site from flooding these are discussed in Section 5.0.

4.5 Natural Resources Wales Flood Zones

A review of the Natural Resources Wales Flood Zones indicates that the majority of the site is located within Flood Zone 1 and therefore has a 'low probability' of fluvial flooding (see Drawing 2). However, a small proportion of the site is located within Flood Zones 2 and 3 and therefore has a 'medium to high probability' of fluvial flooding.

A small area on the eastern and southern boundaries of the site is located within Flood Zone 2 and a very small area of the site on the eastern boundary is located within Flood Zone 3. However, it should be noted that the vast majority of the proposed development will be located within Flood Zone 1 (see Appendix 5). The proposed car park to the north as well as the very northern part of the cycle track and the very southern part of the cycle track will be located within Flood Zone 2. A very small part of two proposed embankments on the eastern boundary of the site will be located within Flood Zone 3.

The Natural Resources Wales Flood Zones are explained in Table 4.2. The Flood Zones are the current best information on the extent of the extremes of flooding from rivers or the sea that would occur without the presence of flood defences, because these can be breached, overtopped and may not be in existence for the lifetime of the development. The Natural Resources Flood Zones show the worst-case scenario.

Table 4-2 Natural Resources Wales Flood Zones.

Flood Zone	Probability	Explanation
Zone 1	Low	• the extent of a flood from rivers or from the sea with less than a 0.1% (1 in 1000) chance of happening in any given year
Zone 2	Medium	• the extent of a flood from rivers or from the sea with up to a 0.1% (1 in 1000) chance of happening in any given year • contains areas recorded to have flooded in the past • Flood Zone 2 is important from a planning context as it forms the basis of Zone C in the Welsh Government Development Advice Map (DAM)
Zone 3	High	• the extent of a flood from rivers with a 1% (1 in 100) chance or greater of happening in any given year • the extent of a flood from the sea with a 0.5% (1 in 200) chance or greater of happening in any given year

4.6 Development Advice Map

The Development Advice Map (DAM) which accompanies TAN15 shows that the majority of the site is located within Zone A - Considered to be at little or no risk of fluvial or tidal/coastal flooding. However, a small proportion of the site, on the northern and western boundaries of the site, is shown to be located within Zone B - Areas known to have been flooded in the past evidenced by sedimentary deposits. It should be noted that Zone B does not match the historical flood outline at this location.

A small proportion of the site is located within Zone C2, on the eastern and southern boundaries of the site. Zone C2 is defined as areas of the floodplain without significant flood defence infrastructure (see Drawing 3).

However, it should be noted that the vast majority of the proposed development will be located within Zone A. The proposed car park to the north as well as the very northern part of the cycle track and the very southern part of the cycle track will be located within Zone C2. A very small part of two proposed embankments on the eastern boundary of the site will be located within Zone C2.

Table 4-3 describes the composition and use of the TAN15 zones to control and manage development. Applying the Flood Risk Vulnerability Classification in Figure 2 of TAN15, the proposed development is classified as ‘less vulnerable’.

Table 4-3 TAN15 Flood Zones.

Description of Zone	Zone	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 Natural Resources Wales 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.

4.7 Fluvial (river) Flooding

The primary flood risk posed to the site is fluvial flooding from the River Usk. Natural Resources Wales have provided results from a 1D/ 2D linked Flood Modeller Pro-TuFLOW hydraulic from the River Usk from upstream of the A4143 (Merthyr Road) bridge to downstream of the A465 crossing.

Figures 4-1 to 4-3 show that the majority of the site will not be inundated with floodwater for all events up to and including the 1 in 100 year (+20%) and 1 in 1000 year events. The majority of the site will be flood free during the defended the 1 in 100 year (+20%) and 1 in 1000 year events. Only a very small proportion of the site may be inundated with floodwater on the eastern boundary of the site.

Table 4-4 shows the defended modelled water levels for the site. While the 1 in 100 year (+25%) water level has not been provided by Natural Resources Wales, it can be inferred, due to the very small difference to be expected between the defended 1 in 100 year (+20%) and 1 in 100 year (+25%) events.

There is an increase in water level of 0.22m from the 1 in 100 year event to the 1 in 100 year (+20%) event or 0.011m per 1% of climate change increase. When this is pro-rated for the 1 in 100 year (+25%) event the water level would be 46.61mAOD, which is less than the 1 in 1000 year water levels for the site. Therefore, during the 1 in 100 year (+25%) event the flood outline will be very similar to the 1 in 100 year (+20%) and 1 in

1000 year events. The majority of the site will not be inundated with floodwater for all events up to and including the 1 in 100 year (+25%) event. The majority of the site will be flood free during the defended the 1 in 100 year (+25%) event.

The majority of the site ground levels are well above 47.00mAOD therefore, the majority of the site will not be inundated with floodwater during the 1 in 100 year (+25%) and 1 in 1000 year events. Only a very small proportion of the site may be inundated with floodwater on the eastern boundary of the site.

The area of the site to the north where car park and shipping containers will be located has been shown to be not located within the 1 in 100 year (+25%) and 1 in 1000 year flood outlines. This area has a minimum ground level of 48.87mAOD which provides a freeboard of 0.27m above the 1 in 1000 year water level, for this location, of 48.60mAOD.

Figure 4-1 Defended 1 in 100 year (+20%) Event Water Depths.

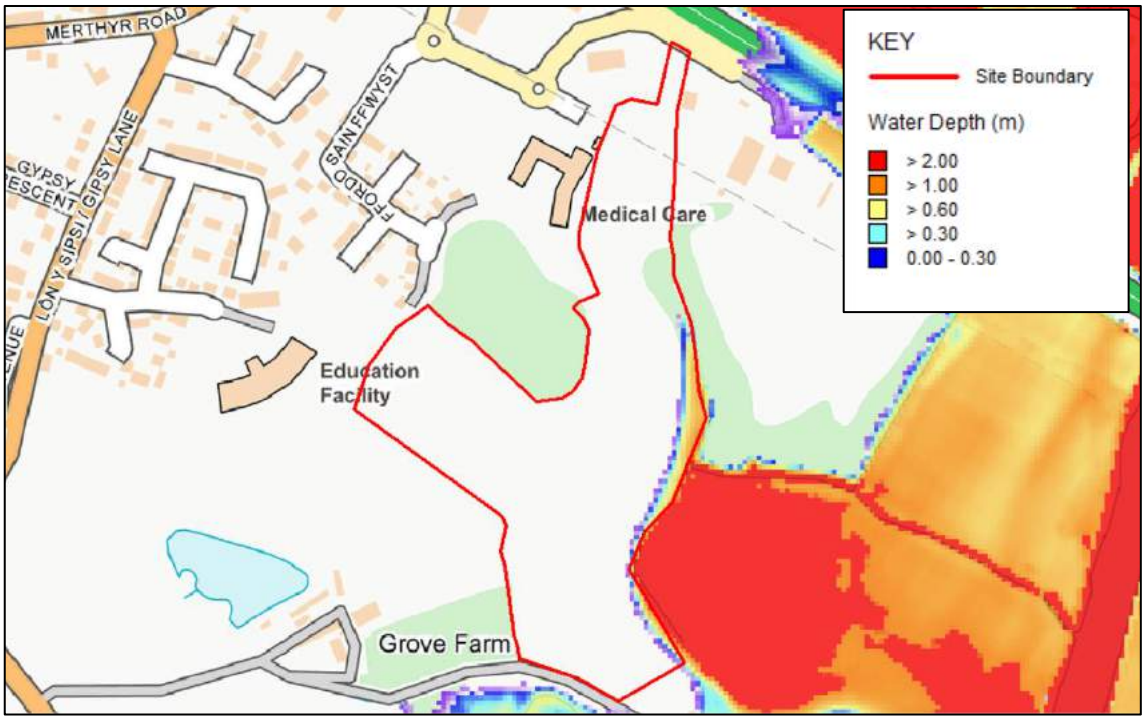


Figure 4-2 Defended 1 in 1000 year Event Water Depths.

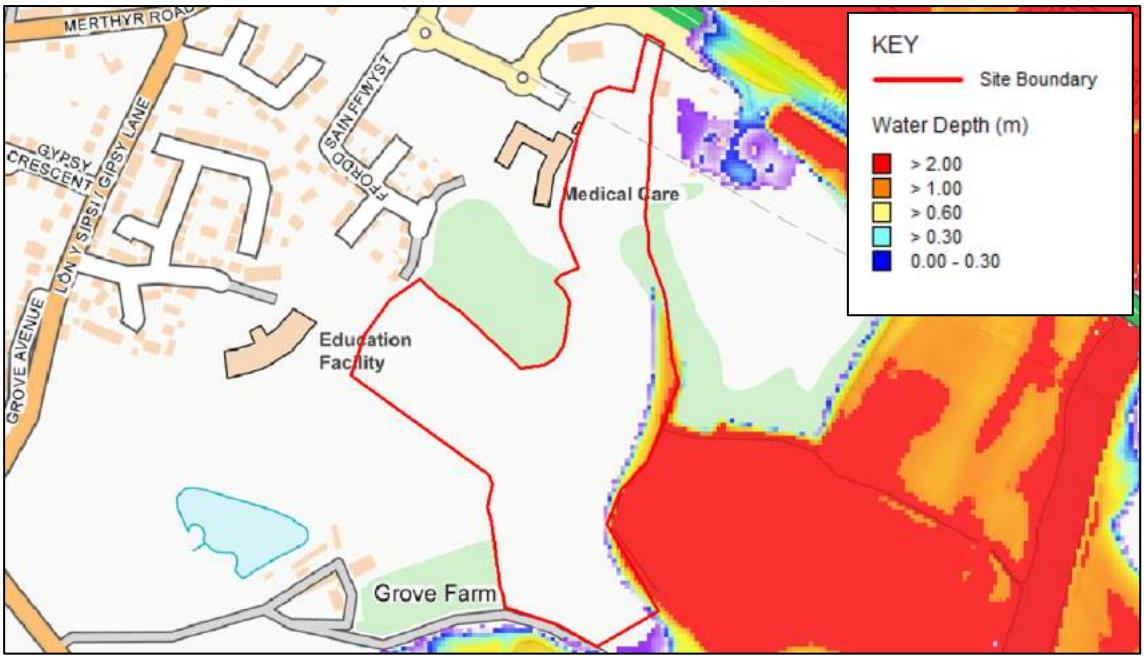


Figure 4-3 Defended 1 in 1000 year Event Hazard Rating.

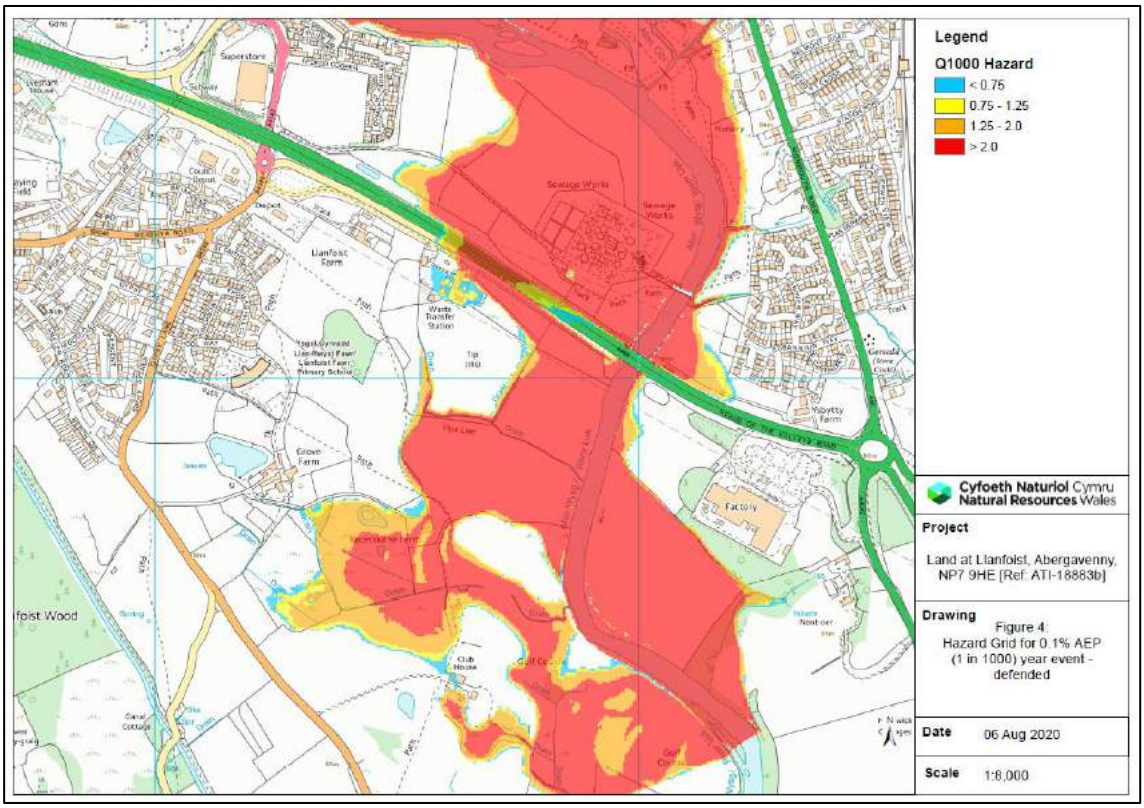


Table 4-4 Defended Modelled Water Levels (mAOD).

Parameter	100	100 +20%	100 +25%	1000
Car Park to the north	Null	Null	Null	48.60
Rest of the site	46.33	46.55	46.61	46.90

Flood risk to the site from the River Usk can be considered to be limited. Any overbank flow would follow the contours of the surrounding area and would flow away from the site rather than flowing towards the site. The flood risk can also be considered to be limited due to the difference in elevations.

Given the scale and nature of the proposed development it has been concluded that flooding from fluvial flooding poses a low flood risk to the site. Therefore, the risk of flooding from fluvial flooding is considered to of **low significance**. The risk of fluvial flooding will be further managed and mitigated by using a number of risk management measures to manage and reduce the overall flood risk at the site (see Section 5.0).

4.8 Tidal (coastal) Flooding

The site is not located within the vicinity of tidal flooding sources and the risk of tidal flooding is considered to be **not significant**.

4.9 Groundwater Flooding

Groundwater flooding is defined as the emergence of groundwater at the ground surface or the rising of groundwater into man-made ground under conditions where the normal range of groundwater levels is exceeded.

Groundwater flooding tends to occur sporadically in both location and time. When groundwater flooding does occur, it tends to mostly affect low-lying areas, below surface infrastructure and buildings (for example, tunnels, basements and car parks) underlain by permeable rocks (aquifers).

The Monmouth County Council PFRA and Monmouth County Council SFCA confirm that the risk of groundwater flooding is considered to be low, and it is not considered to be a significant issue within the catchment. Also no below surface infrastructure and buildings are located or are proposed for the site.

Therefore, the risk of flooding from groundwater flooding is considered to be **not significant**.

4.10 Surface Water (pluvial) Flooding

Surface water flooding tends to occur sporadically in both location and time such surface water. The site is not situated on and adjacent to areas of permeability and areas with geology which may result in surface water flooding.

The Natural Resources Wales Surface Water flood map shows that the site has a very low risk of surface water flooding with a chance of flooding of less than 1 in 1000 (0.1%)

years (see Drawing 4). However, a very small proportion of the site, to the north, is shown to have a low to high risk of surface water flooding. The proposed development is located on greenfield land and the area slopes down gently towards the River Usk. The soils on the greenfield land are permeable and drain naturally via infiltration.

Therefore, the risk of flooding from surface water flooding is considered to be of **low significance**. The risk of surface water flooding will be further managed and mitigated by using a number of risk management measures to manage and reduce the overall flood risk at the site (see Section 5.0).

4.11 Sewer Flooding

Sewer flooding occurs when urban drainage networks become overwhelmed and maximum capacity is reached. This can occur if there is a blockage in the network causing water to back up behind it or if the sheer volume of water draining into the system is too great to be handled. Sewer flooding tends to occur sporadically in both location and time such flood flows would tend to be confined to the streets around the development.

Any existing sewers located within the vicinity of the will inevitably have a limited capacity so in extreme conditions there would be surcharges, which may in turn cause flooding. Flood flows could also be generated by burst water mains but these would tend to be of a restricted and much lower volume than weather generated events and so can be discounted for the purposes of this assessment.

Given the design parameters normally used for drainage design in recent times and allowing for some deterioration in the performance of the installed systems, which are likely to have been in place for many years, an appropriate flood risk probability from this source could be assumed to have a return period in the order of 1 in 10 to 1 in 20 years.

The provision of adequate level difference between the ground levels and the invert levels of sewers would reduce the annual probability from this source to 1 in 100 years or less. The risk of flooding from sewer flooding is considered to be **not significant**.

4.12 Flooding from Artificial Drainage Systems/Infrastructure Failure

The Usk and Talybont reservoirs are located upstream of the site, approximately 62km and 26km away respectively. The Natural Resources Wales Reservoir flood map show that the site is not at risk of flooding from reservoir failure (see Drawing 5). This map shows the largest area that might be flooded if a reservoir were to fail and release the water they holds.

It is understood that the reservoirs are managed by Dwr Cymru who act as ‘undertaker’, under the Reservoirs Act 1975 (and subsequent amendments), ensuring that reservoir safety is maintained through regular monitoring and inspections by qualified civil engineers appointed by Defra.

Whilst the consequences of reservoir breaching can be very high, continuing management of reservoirs under the Reservoirs Act serves to greatly reduce the likelihood of a breach occurring. As such, in line with the scale and nature of the proposed development, it is not considered that any changes to the proposed development are required, over and above those recommended to mitigate against fluvial and coastal flood

The proposed development is located approximately 700 north east of the Monmouthshire and Brecon canal. The canal is situated on a high embankment in the vicinity of the site. The topography of the area suggests that, if the canal were to breach, the site could be at

The Local Flood Risk Management Strategy (LFRMS) produced by Monmouthshire County Council (2013) states that, if the canal was to collapse at Llanfoist (within OS grid square SO 2813, to the west of the site), 10 properties would be at risk of flooding in this area. It is thought highly unlikely that the site would be at risk from a canal breach considering that only 10 properties are thought to be at significant risk if a breach was to occur in the Llanfoist area and that it is unlikely that any breach water would be able to reach this far.

There are no other nearby artificial water bodies, reservoirs, water channels and artificial drainage systems that could be considered a flood risk to the site. The risk of flooding from artificial drainage systems/infrastructure failure is considered to be **not significant**.

4.13 Effect of the Development on Flood Risk

Ground levels within the car park and the very north part of the cycle track, both of which are located within Flood Zone 2, will not change as part of the proposed development (see Figure 4-4). Furthermore, this area of the site, to the north, has been shown to be not located within the 1 in 100 year (+25%) and 1 in 1000 year flood outlines. This area has a minimum ground level of 48.87mAOD which provides a freeboard of 0.27m above the 1 in 1000 year water level, for this location, of 48.60mAOD.

Appendix 6 shows 3 areas where cut and fill will occur. The areas identified as parcels 1 and 2 are shown to be located within Flood Zone 2 however, ground levels are above the 1 in 1000 year water level of 46.90mAOD for these locations. Cut and fill will occur however, it will not occur within the 1 in 1000 year flood outline as ground levels are above the 1 in 1000 year water level.

For parcel 3 the ground level is lower than the 1 in 1000 year water level of 46.90mAOD for this location, cut and fill will occur within the 1 in 1000 year flood outline. Table 4.5 shows that the proposed development will result in an increase in floodplain storage of 136.39m3, as overall there will be more cut than fill during the construction phase.

The design of the lowered area ensures that the performance of the floodplain and the flood hydrograph will remain unaltered and flood risk will not be worsened and replaces the storage lost due to the development at the same level as it is lost. This ensures that the storage is filled at the same time during a flood event as it does under existing conditions.

Supplementary site investigations will be required to confirm ground stability before the design can be finalised. Prior to this work commencing site investigation work is required to ascertain the ground stability before a final scheme can be confirmed.

Overall the proposed development will have no impact on flood risk and the overall direction of the movement of water will be maintained within the developed site and surrounding area. There will be a gain in flood storage capacity. The conveyance routes (flow paths) will not be blocked or obstructed.

Figure 4-4 Areas of Ground Modification within the Flood Zones.

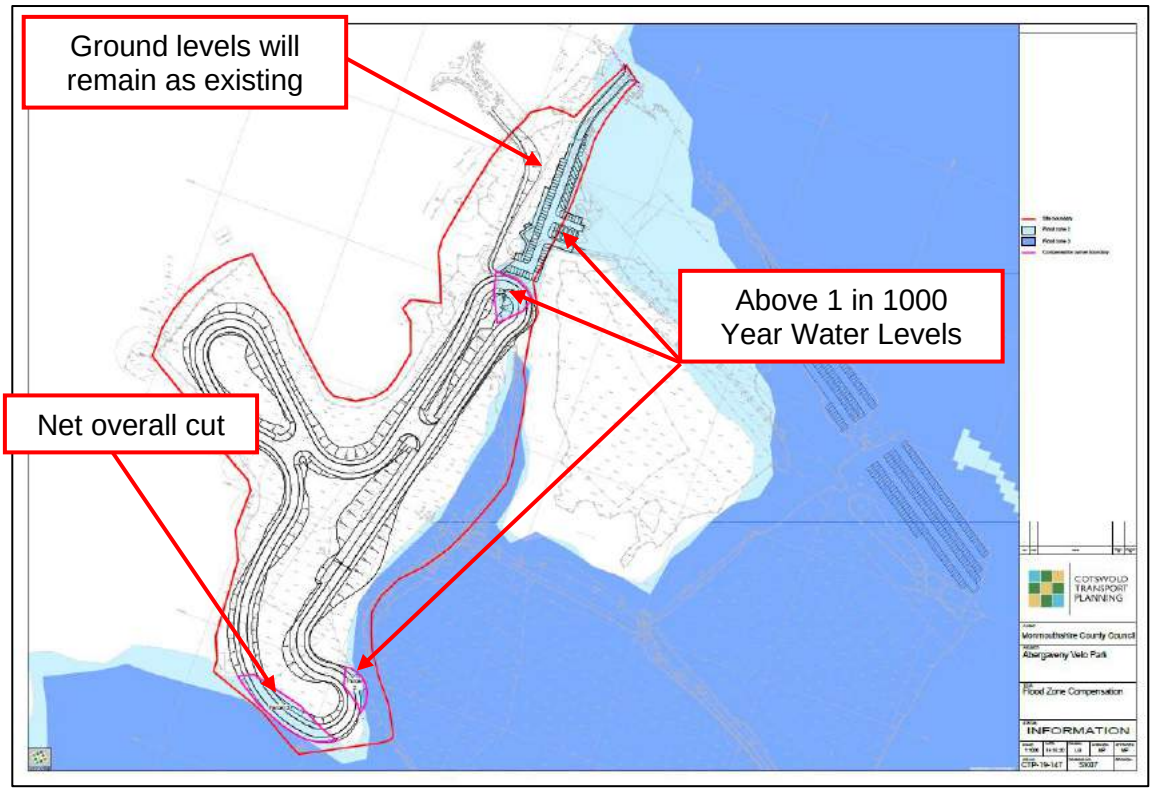


Table 4-5 Cut and Fill Calculations within 1 in 1000 Year Flood Outline

Location	Cut (m^3)	Fill (m^3)	Net (m^3)
Parcel 3	217.87	81.49	Cut - 136.39

4.14 Summary of Site Specific Flood Risk Assessment

A summary of the sources of flooding and a review of the risk posed by each source at the site is shown in Table 4-6.

The site is unlikely to flood except in extreme conditions. The primary, but unlikely, flood risk to the site is fluvial flooding from the River Usk. The proposed development is classified as 'less vulnerable'.

The majority of the site is located within Flood Zone 1 and therefore has a 'low probability' of fluvial flooding. However, a small proportion of the site is located within Flood Zones 2 and 3 and therefore has a 'medium to high probability' of fluvial flooding.

A small area on the eastern and southern boundaries of the site is located within Flood Zone 2 and a very small area of the site on the eastern boundary is located within Flood

Zone 3. However, it should be noted that the vast majority of the proposed development will be located within Flood Zone 1. The proposed car park to the north as well as the very northern part of the cycle track and the very southern part of the cycle track will be located within Flood Zone 2. A very small part of two proposed embankments on the eastern boundary of the site will be located within Flood Zone 3.

The majority of the site is located within DAM Zone A - Considered to be at little or no risk of fluvial or tidal/coastal flooding. However, a small proportion of the site, on the northern and western boundaries of the site, is shown to be located within Zone B - Areas known to have been flooded in the past evidenced by sedimentary deposits. It should be noted that Zone B does not match the historical flood outline at this location.

A small proportion of the site is located within Zone C2, on the eastern and southern boundaries of the site. Zone C2 is defined as areas of the floodplain without significant flood defence infrastructure.

However, it should be noted that the vast majority of the proposed development will be located within Zone A. The proposed car park to the north as well as the very northern part of the cycle track and the very southern part of the cycle track will be located within Zone C2. A very small part of two proposed embankments on the eastern boundary of the site will be located within Zone C2.

The Natural Resources Wales modelled flood outlines show that the majority of the site will not be inundated with floodwater for all events up to and including the 1 in 100 year (+20%) and 1 in 1000 year events. The majority of the site will be flood free during the defended the 1 in 100 year (+20%) and 1 in 1000 year events. Only a very small proportion of the site may be inundated with floodwater on the eastern boundary of the site.

During the 1 in 100 year (+25%) event the flood outline will be very similar to the 1 in 100 year (+20%) and 1 in 1000 year events. The majority of the site will not be inundated with floodwater for all events up to and including the 1 in 100 year (+25%) event. The majority of the site will be flood free during the defended the 1 in 100 year (+25%) event.

The majority of the site ground levels are well above 47.00mAOD therefore, the majority of the site will not be inundated with floodwater during the 1 in 100 year (+25%) and 1 in 1000 year events. Only a very small proportion of the site may be inundated with floodwater on the eastern boundary of the site.

Given the scale and nature of the proposed development it has been concluded that flooding from fluvial flooding poses a low flood risk to the site. Therefore, the risk of flooding from fluvial flooding is considered to of **low significance**. A secondary flooding source has been identified which may pose a **low significant** risk to the site. This is:

- Surface Water (pluvial) Flooding

The flooding sources will only inundate the very south of the site to a relatively low water depth and water velocity, will only last a short period of time, in very extreme cases and will not have an impact on the whole of the proposed development site. The risk from all flooding sources will be further mitigated by using a number of risk management measures to manage and reduce the overall flood risk at the site.

Overall the proposed development will have no impact on flood risk and the overall direction of the movement of water will be maintained within the developed site and surrounding area. There will be a gain in flood storage capacity, as overall there will be

more cut than fill during the construction phase. The conveyance routes (flow paths) will not be blocked or obstructed.

Table 4-6 Risk Posed by Flooding Sources.

Sources of Flooding	Potential Flood Risk	Potential Source	Probability/Significance
Fluvial (river) Flooding	Yes	River Usk	Low
Tidal (coastal) Flooding	No	None Reported	Not significant
Groundwater Flooding	No	None Reported	Not significant
Surface Water (pluvial) Flooding	Yes	Poor Permeability	Low
Sewer Flooding	Yes	Sewers	Not significant
Flooding from Artificial Drainage Systems/Infrastructure Failure	Yes	Usk and Talybont reservoirs, Monmouthshire and Brecon canal	Not significant

5 Risk Management

5.1 Introduction

In this flood zone, developers and local authorities should seek opportunities to reduce the overall level of flood risk in the area through the layout and form of the development and the use of flood mitigation measures.

A number of techniques and mitigation strategies to manage and reduce the overall flood risk in the area will be used. This will ensure the development will be safe and there is:

- Minimal risk to life;
- Minimal disruption to people living and working in the area;
- Minimal potential damage to property;
- Minimal impact of the proposed development on flood risk generally; and;
- Minimal disruption to natural heritage.

5.2 Flood Warning and Evacuation

The site is located in a flood risk area therefore; the site will participate in Natural Resources Wales flood warning telephone service in order to receive Flood Warnings. Natural Resources Wales operate a free flood warning service providing alerts by phone, text or email when flooding is anticipated providing an opportunity to take necessary precautions, giving enough time to be safely evacuated and mitigation measures to be put in place.

A Flood Warden for the site will be appointed, it will be ensured that they have an understanding of the flood mechanisms of the site. The Flood Warden will ensure that the safety of the occupants and visitors will not be compromised.

Natural Resources Wales uses Flood Warnings Codes. They can be issued in any order, usually ending with an 'all clear'. They are issued by Natural Resources Wales through their website and Floodline Warning Service. The flood warning will be passed onto the occupiers and visitors of the site verbally, by telephone and/or in person. It will be ensured that everyone receives the flood warnings when required.

The following points are key to ensuring that the emergency procedures are adhered to:

- The site must be used solely by visitors to the ‘velo’ park’.
- The car park design incorporates barriers to restrict access outside of opening hours.
- The site and car park is to be closed on receipt of a Natural Resources Wales flood warning.

The advance flood warning time for a flood event from the River Usk is a minimum of seven hours. As the car park is only intended for ‘velo park’ users, this is considered to be sufficient time to close and evacuate the car park prior to flooding from the River Usk. Flood warning signs should be displayed prominently in and around the car park, clearly

stating the potential flood risk. The signs should also include details, in both text and map form, of the evacuation route detailed in Section 5.4.

5.3 Flood Plan

A Flood Plan outlining the precautions and actions you should take when a flood event is anticipated to help reduce the impact and damage flooding may cause will be developed. The Flood Plan is a 'living' document and therefore should be periodically reviewed and updated to provide advice and guidance to occupants in the event of an extreme flood. The Flood Plan will therefore reduce the vulnerability of the visitors to flooding and makes them aware of the mechanisms of flooding at the site.

5.4 Safe Access and Egress Route

Access routes should be such that occupants can safely access and exit their buildings in design flood conditions. These routes must also provide the emergency services with access to the development during a flood event and enable flood defence authorities to carry out any necessary duties during the period of flood.

The site is one of the last places in the area to flood and remains flood free when other areas close by are flooded. The site is at such a ground level that it would only flood in the most extreme flood events; the site will remain flood free for the vast majority of flood events during the lifetime of the proposed development.

The typical rainfall profile for this region, in common with much of South-Wales, is a low intensity, long duration event commensurate with frontal weather systems. The limits of speed of inundation and rate of floodwater rise would not be exceeded.

The mechanism for flooding from fluvial flooding is generally prolonged episodes of high rainfall, which affords good time for flood warnings to be issued. The site is located within a low risk area where the onset of flooding is very gradual (many hours) as per Flood Risk Assessment Guidance for New Development Phase 2, R&D Technical Report FD2320/TR2.

The likelihood of a rapid water level rise and possible rapid inundation of urban areas posing a risk to life is considered to be minimal with a forewarning of a minimum of seven hours of a pending flood event. The above factors would, therefore, allow safe access and egress to occur.

In the event of a Flood Warning, vital belongings, including waterproof clothing, necessary medication and essentials will be collected. It should be ensured that all occupiers and visitors to the site are accounted for, and then exit the site using the route shown in Drawing 6, via the site access and then to the west along the A465.

5.5 Flooding Consequences

The site is unlikely to flood except in extreme conditions. The site can be justified in accordance with TAN15 as it can be demonstrated that the consequences of flooding can be managed down to a level which is acceptable for the nature and type of site. The mitigation measures detailed above show that the flood risk can be effectively managed and therefore the consequences of flooding are acceptable.

6 Justifying the Location of the Development

6.1 Justification Test

The Justification Test sets out the details required to justify siting a new development in an area believed to be at risk of flooding and is defined in Section 6 of TAN15.

The site has been designated as suitable in size and location to accommodate the proposed development. Abergavenny has long been regarded as an important centre for cycling in Wales, and the provision of a purpose-built cycling centre or 'velo park' concept in the Abergavenny area has been included as a priority in Welsh Cycling's national facilities strategy. The Council and Welsh Cycling have been seeking to establish a facility in the Abergavenny area since 2013 to enhance the reputation of the town as the main cycling destination in Wales.

A hub, or 'velo park' is proposed with a mix of different cycling facilities built around a core CRC for road-based activity, as well as developing opportunities for other forms of cycling e.g. cyclocross, trails, skills, family use. Ideally, a national standard CRC facility would be achieved (1.50km length), although as a minimum the facility needs to achieve regional standards (1km) that serves at least a one-hour travel-time catchment area.

The potential consequences of a flooding event for the particular type of development have been considered within this FCA. This FCA details the potential consequences of flooding from all sources taking into account the proposed development type has been considered and has been found to be acceptable. The development proposals should be considered by the LPA to satisfy the Justification Test as set out in TAN15.

6.2 Assessment of Acceptability Criteria

New development should be directed away from Zone C and towards suitable land in Zone A, otherwise to Zone B, where river or coastal flooding will be less of an issue. However, in some areas where developable land is in short supply, there can be an overriding need to build in areas that are at risk of flooding.

The Council's objectives are to sustain and enhance the vitality and viability of the region, and to ensure a wide range of employment to which people have easy access by a range of transport therefore, improving the overall quality of life. This is underpinned by the quality of the physical environment, social well-being and economic and environmental improvements. The Council seeks to grant permission for developments that add to the vitality and viability of the region.

This site will help to regenerate the region and will help to deliver these objectives. This site will help encourage economic impetus. The wider area surrounding the proposed development site is affected by a very similar, and in many cases, higher risk of flooding. The application is for a new, suitable flood-resilient design. From the above it is shown that there are overriding sustainability reasons for the development to be granted planning permission within these sites

An assessment of the flood consequences to the site in an extreme flood has been undertaken as per the indicative guidelines as given within Table A1.14 and A1.15 of TAN15.

Figures 4-1 to 4-3 show that the site will not be inundated with floodwater for all events up to and including the 1 in 100 year (+20%) and 1 in 1000 year events. The site will be flood free during the defended the 1 in 100 year (+20%) and 1 in 1000 year events. Therefore, the actual flood risk posed to the site is less than 1 in 1000 years.

During the 1 in 100 year (+25%) event the very south of the site may be inundated with floodwater to a maximum depth of 0.10m. The majority of the site ground levels are well above 47.02mAOD at above 48.00mAOD therefore, the majority of the site will not be inundated with floodwater during the 1 in 100 year (+25%) event.

The mechanism for flooding is generally prolonged episodes of rainfall, which affords good time for flood warnings to be issued. The likelihood of a rapid water level rise and possible rapid inundation of urban areas posing a risk to life is considered to be minimal. The site is located within a low risk area where the onset of flooding is very gradual (many hours) as per Flood Risk Assessment Guidance for New Development Phase 2, R&D Technical Report FD2320/TR2.

Therefore, the site is compliant with A1.14 and A1.15 of TAN15. The consequences of flooding can be acceptably managed for the lifetime of the development recognising the small scale proposal on the edge of floodplain. The development proposals should therefore be considered by the LPA to satisfy the Acceptability Criteria as set out in TAN15.

7 Summary and Conclusions

7.1 Introduction

This report presents an FCA in accordance with TAN15 for the proposed development of Abergavenny Velo Park, Llanfoist, Abergavenny, NP7 9HE.

7.2 Flood Risk

The site is unlikely to flood except in extreme conditions. The primary, but unlikely, flood risk to the site is fluvial flooding from the River Usk. The proposed development is classified as 'less vulnerable'.

The majority of the site is located within Flood Zone 1 and therefore has a 'low probability' of fluvial flooding. However, a small proportion of the site is located within Flood Zones 2 and 3 and therefore has a 'medium to high probability' of fluvial flooding.

A small area on the eastern and southern boundaries of the site is located within Flood Zone 2 and a very small area of the site on the eastern boundary is located within Flood Zone 3. However, it should be noted that the vast majority of the proposed development will be located within Flood Zone 1. The proposed car park to the north as well as the very northern part of the cycle track and the very southern part of the cycle track will be located within Flood Zone 2. A very small part of two proposed embankments on the eastern boundary of the site will be located within Flood Zone 3.

The majority of the site is located within DAM Zone A - Considered to be at little or no risk of fluvial or tidal/coastal flooding. However, a small proportion of the site, on the northern and western boundaries of the site, is shown to be located within Zone B - Areas known to have been flooded in the past evidenced by sedimentary deposits. It should be noted that Zone B does not match the historical flood outline at this location.

A small proportion of the site is located within Zone C2, on the eastern and southern boundaries of the site. Zone C2 is defined as areas of the floodplain without significant flood defence infrastructure.

However, it should be noted that the vast majority of the proposed development will be located within Zone A. The proposed car park to the north as well as the very northern part of the cycle track and the very southern part of the cycle track will be located within Zone C2. A very small part of two proposed embankments on the eastern boundary of the site will be located within Zone C2.

The Natural Resources Wales modelled flood outlines show that the majority of the site will not be inundated with floodwater for all events up to and including the 1 in 100 year (+20%) and 1 in 1000 year events. The majority of the site will be flood free during the defended the 1 in 100 year (+20%) and 1 in 1000 year events. Only a very small proportion of the site may be inundated with floodwater on the eastern boundary of the site.

During the 1 in 100 year (+25%) event the flood outline will be very similar to the 1 in 100 year (+20%) and 1 in 1000 year events. The majority of the site will not be inundated with floodwater for all events up to and including the 1 in 100 year (+25%) event. The majority of the site will be flood free during the defended the 1 in 100 year (+25%) event.

The majority of the site ground levels are well above 47.00mAOD therefore, the majority of the site will not be inundated with floodwater during the 1 in 100 year (+25%) and 1 in 1000 year events. Only a very small proportion of the site may be inundated with floodwater on the eastern boundary of the site.

Given the scale and nature of the proposed development it has been concluded that flooding from fluvial flooding poses a low flood risk to the site. Therefore, the risk of flooding from fluvial flooding is considered to of **low significance**. A secondary flooding source has been identified which may pose a **low significant** risk to the site. This is:

- Surface Water (pluvial) Flooding

The flooding sources will only inundate the very south of the site to a relatively low water depth and water velocity, will only last a short period of time, in very extreme cases and will not have an impact on the whole of the proposed development site. The risk from all flooding sources will be further mitigated by using a number of risk management measures to manage and reduce the overall flood risk at the site.

Overall the proposed development will have no impact on flood risk and the overall direction of the movement of water will be maintained within the developed site and surrounding area. There will be a gain in flood storage capacity, as overall there will be more cut than fill during the construction phase. The conveyance routes (flow paths) will not be blocked or obstructed.

7.3 Risk Management

The flood risk at the site will be reduced by the following risk management measures:

Flood Warning and Evacuation: The site is located in a flood risk area therefore; the site will participate in Natural Resources Wales flood warning telephone service in order to receive Flood Warnings. Natural Resources Wales operate a free flood warning service providing alerts by phone, text or email when flooding is anticipated providing an opportunity to take necessary precautions, giving enough time to be safely evacuated and mitigation measures to be put in place.

The following points are key to ensuring that the emergency procedures are adhered to:

- The site must be used solely by visitors to the ‘velo’ park’.
- The car park design incorporates barriers to restrict access outside of opening hours.
- The site and car park is to be closed on receipt of a Natural Resources Wales flood warning.

Flood Plan: A Flood Plan outlining the precautions and actions you should take when a flood event is anticipated to help reduce the impact and damage flooding may cause will be developed.

Safe Access and Egress Route: The site is one of the last places in the area to flood and remains flood free when other areas close by are flooded. The site is at such a ground level that it would only flood in the most extreme flood events; the site will remain flood free for the vast majority of flood events during the lifetime of the proposed development.

The typical rainfall profile for this region, in common with much of South-Wales, is a low intensity, long duration event commensurate with frontal weather systems. The limits of speed of inundation and rate of floodwater rise would not be exceeded.

The mechanism for flooding from fluvial flooding is generally prolonged episodes of high rainfall, which affords good time for flood warnings to be issued. The site is located within a low risk area where the onset of flooding is very gradual (many hours) as per Flood Risk Assessment Guidance for New Development Phase 2, R&D Technical Report FD2320/TR2.

The likelihood of a rapid water level rise and possible rapid inundation of urban areas posing a risk to life is considered to be minimal. The above factors would, therefore, allow safe access and egress to occur, via the site access and then to the west along the A465.

7.4 Justifying the Location of the Development

The site is compliant with the indicative consequences of flooding as set out in A1.14 and A1.15 of TAN15. The consequences of flooding can be acceptably managed for the lifetime of the development recognising the small scale proposal on the edge of floodplain. The development proposals should therefore be considered by the LPA to satisfy the Justification Test and the Acceptability Criteria as set out in TAN15.

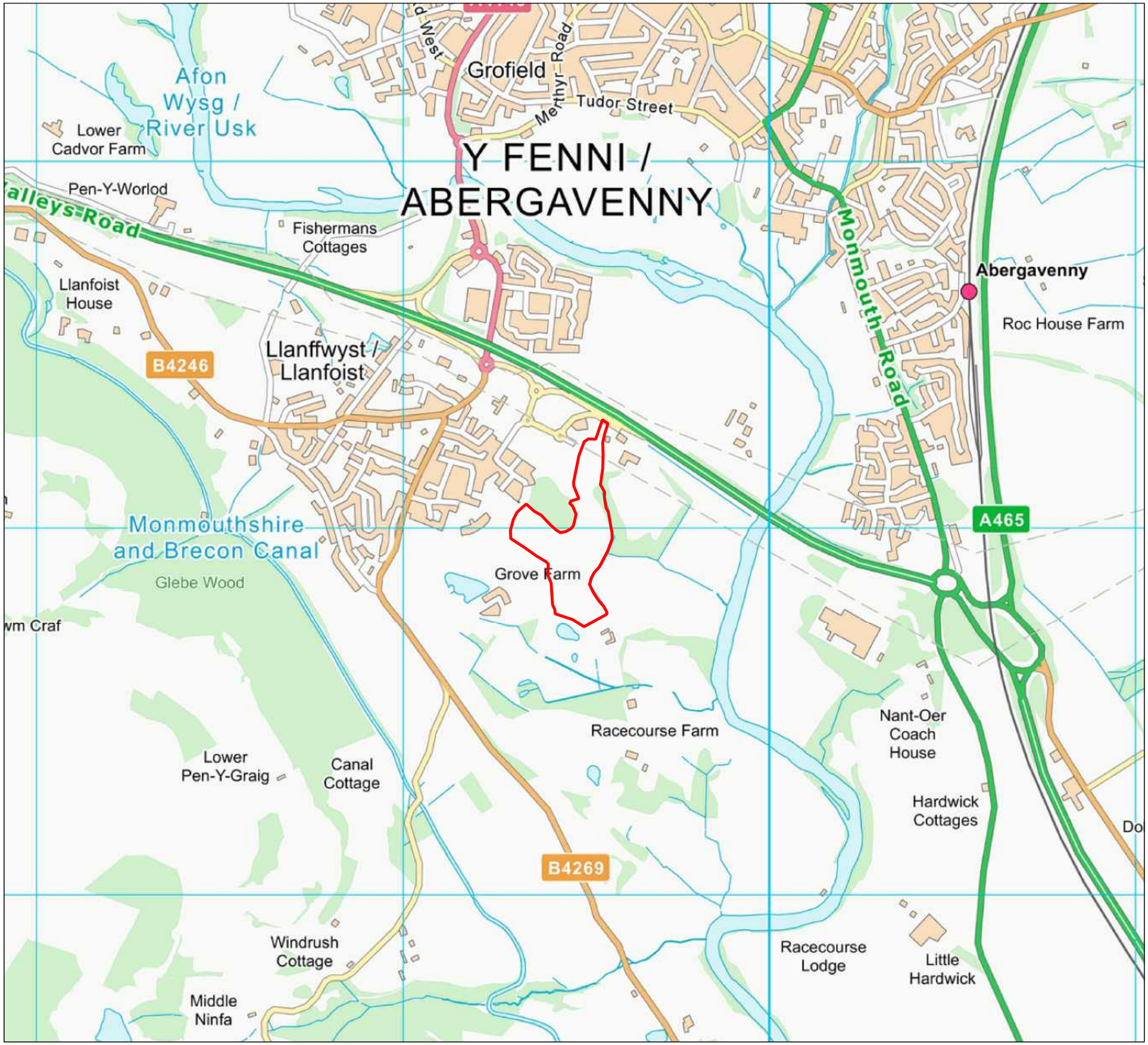
7.5 Conclusion

In conclusion, a ‘velo park’, would be expected to remain dry in all but the most extreme conditions. The proposed development will provide betterment compared to the existing situation.

Providing the recommendations made in this FCA are instigated, flood risk from all sources would be minimised, the consequences of flooding are acceptable, and the development would be in accordance with the requirements of TAN15.

This FCA demonstrates that the proposed development would be operated with minimal risk from flooding, would not increase flood risk elsewhere and is compliant with the requirements of TAN15. The development should not therefore be precluded on the grounds of flood risk.

Drawings



HYDROGEO
Groundwater and Environment

HYG637 Abergavenny Velo Park

DRAWING 1

Site Location Plan

KEY

Site Boundary

© HERE [2020]

200 0 200 400 m

N

Date	By	Paper	Scale	Rev
08 2020	TP	A3	1:2,500	1

HYDROGEO
Groundwater and Environment

HYG637 Abergavenny Velo Park

DRAWING 2

NRW Flood Zones

KEY

- Flood Zone 2
- Flood Zone 3
- Site Boundary

© HERE [2020]

50 0 50 100 m

N

Date	By	Paper	Scale	Rev
08 2020	TP	A3	1:2,500	1

HYDROGEO
Groundwater and Environment

HYG637 Abergavenny Velo Park

DRAWING 3

Development Advice Map

KEY

- Site Boundary
- Development Advice Map - Zone B
- Development Advice Map - Zone C2

© HERE [2020]

50 0 50 100 m

N

Date	By	Paper	Scale	Rev
08 2020	TP	A3	1:2,500	1

HYDROGEO
Groundwater and Environment

HYG637 Abergavenny Velo Park

DRAWING 4

Surface Water Flood Risk

KEY

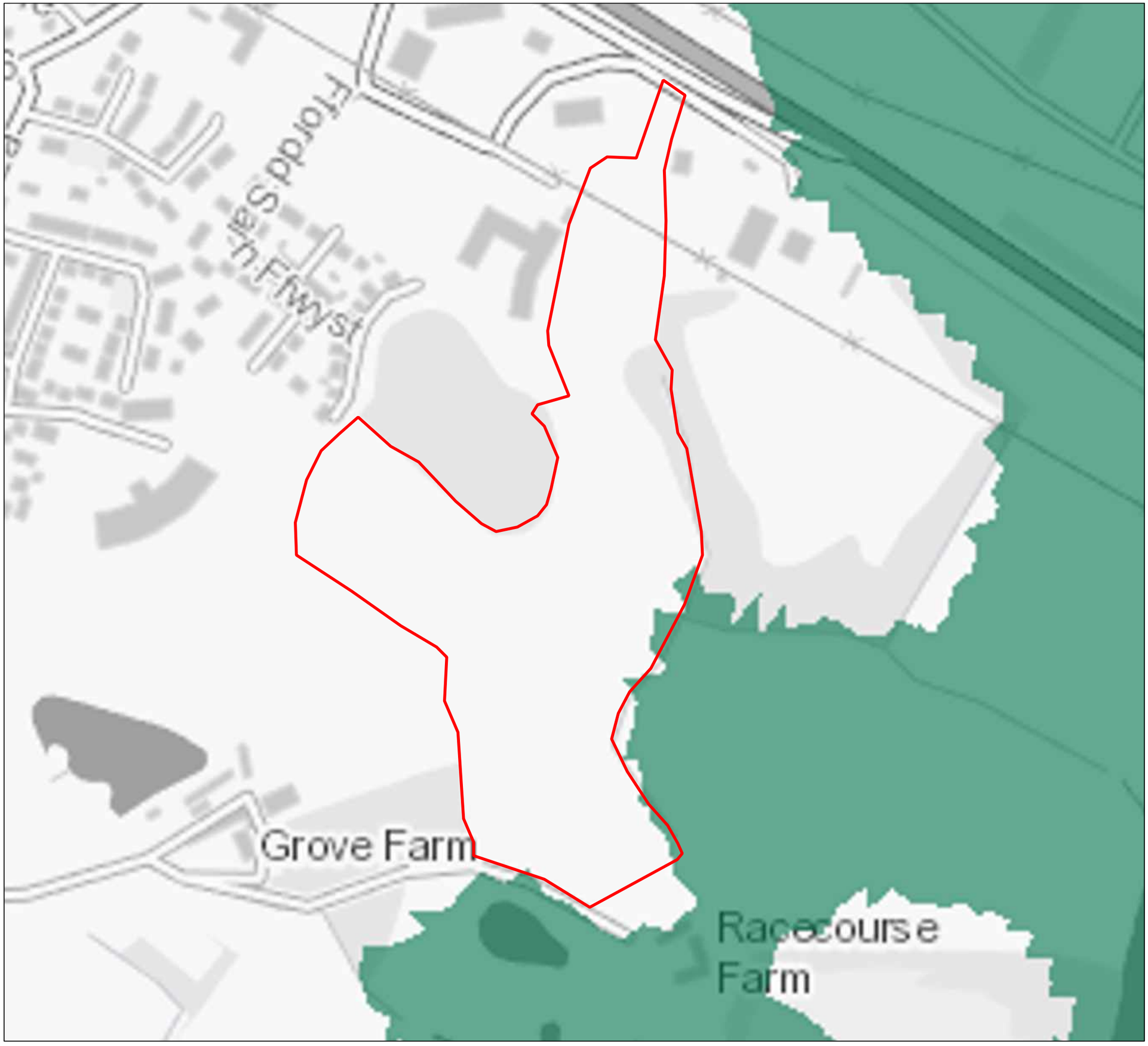
- Site Boundary
- Surface Water and Small Watercourses Flood Extent - High Risk
- Surface Water and Small Watercourses Flood Extent - Medium Risk
- Surface Water and Small Watercourses Flood Extent - Low Risk

© HERE [2020]

50 0 50 100 m

N

Date	By	Paper	Scale	Rev
08 2020	TP	A3	1:2,500	1



HYDROGEO
Groundwater and Environment

HYG637 Abergavenny Velo Park

DRAWING 5

Reservoir Flood Risk

KEY

Site Boundary

Reservoir Flood Risk - Flood Extents

© HERE [2020]

50 0 50 100 m

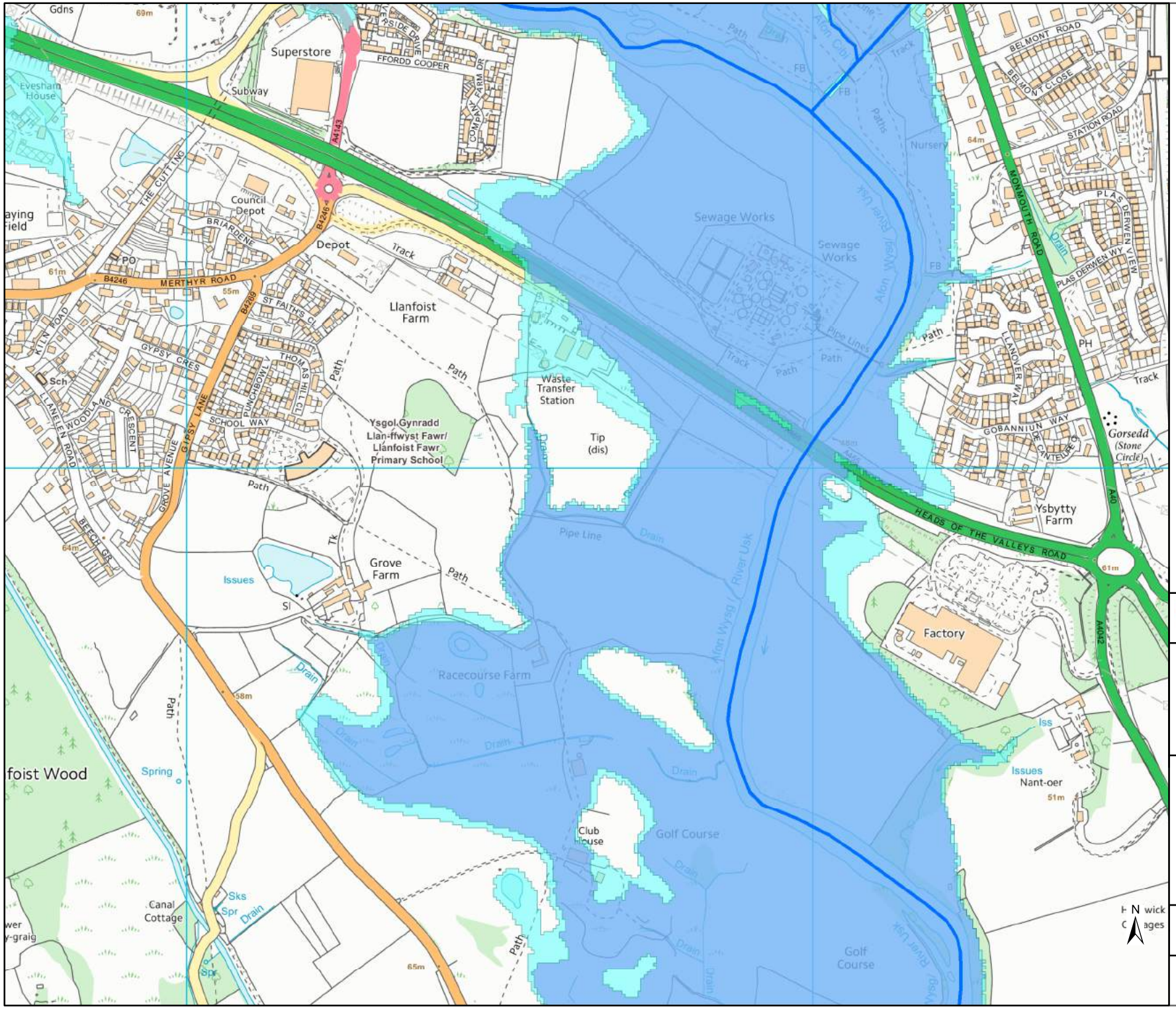
N

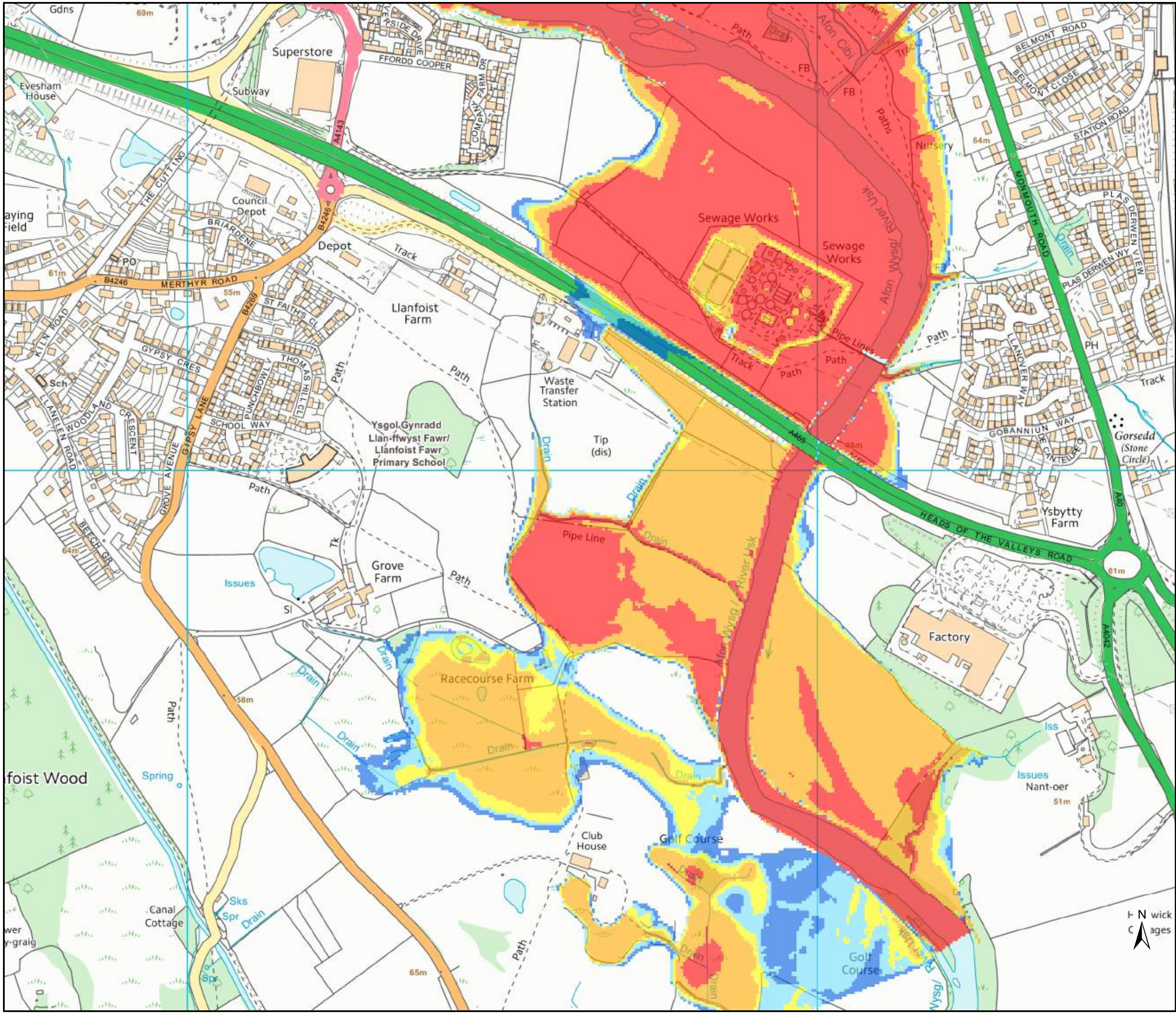
Date	By	Paper	Scale	Rev
08 2020	TP	A3	1:2,500	1

Appendices

Appendix 1

Natural Resources Wales Data


Legend
Defences
Main Rivers
Areas Benefiting from Defences
Flood Storage Areas
Flood Zone 3
Flood Zone 2
Superstore
Subway
Council Depot
Depot
Llanfoist Farm
Waste Transfer Station
Tip (dis)
Ysgol Gynradd Llan-ffwyst Fawr/ Llanfoist Fawr Primary School
Grove Farm
Racecourse Farm
Sewage Works
Golf Course
Club House
Factory
Ysbytty Farm
Gorsedd (Stone Circle)
Nant-oer
Canal Cottage
Afon Wysg / River Usk
B4246
A4143
A40
MERTHYR ROAD
HEADS OF THE VALLEYS ROAD
MONMOUTH ROAD
Cyfoeth Naturiol Cymru
Natural Resources Wales
Project
Land at Llanfoist, Abergavenny, NP7 9HE [Ref: ATI-18883b]
Drawing
Figure 1:
Current Floodmap
[v202001]
Date
06 Aug 2020
Scale
1:8,000


Gdns
Superstore
FFORDD COOPER
Evesham House
Subway
A4143
THE CUTTING
Council Depot
BRIARDENE
Playing Field
B4246
Depot
Track
PO
MERTHYR ROAD
B4269
ST FAITHS CL
Llanfoist Farm
KILN ROAD
GYPSY CRES
THOMAS HILL CL
PUNCHBOWL
Path
Sch
WOODLAND CRESCENT
LANELEN ROAD
GIPSY LANE
SCHOOL WAY
Ysgol Gynradd Llan-ffwyst Fawr/ Llanfoist Fawr Primary School
Waste Transfer Station
Tip (dis)
Drain
Sewage Works
Afon Cibi
FB
Paths
Nursery
River Usk/ Afon Wysg
Pipe Lines
A465
HEADS OF THE VALLEYS ROAD
BELMONT ROAD
BELMONT CLOSE
STATION ROAD
MONMOUTH ROAD
PLAS DERWEN VIEW
PLAS DERWEN WY
LLANOVER WAY
GOBANNIUN WAY
DE CANTELUPE
PH
Track
Gorsedd (Stone Circle)
Ysbytty Farm
A40
Pipe Line
GROVE AVENUE
BEECH DR
Grove Farm
Issues
Racecourse Farm
Factory
A4042
Iss
Nant-oer
foist Wood
Spring
Club House
Golf Course
Canal Cottage
Sks
Spr
Golf Course
N

Legend

Q100+CC Depth (m)

- 0 - 0.3
- > 0.3
- > 0.6
- > 1.0
- > 2.0

Cyfoeth Naturiol Cymru
Natural Resources Wales

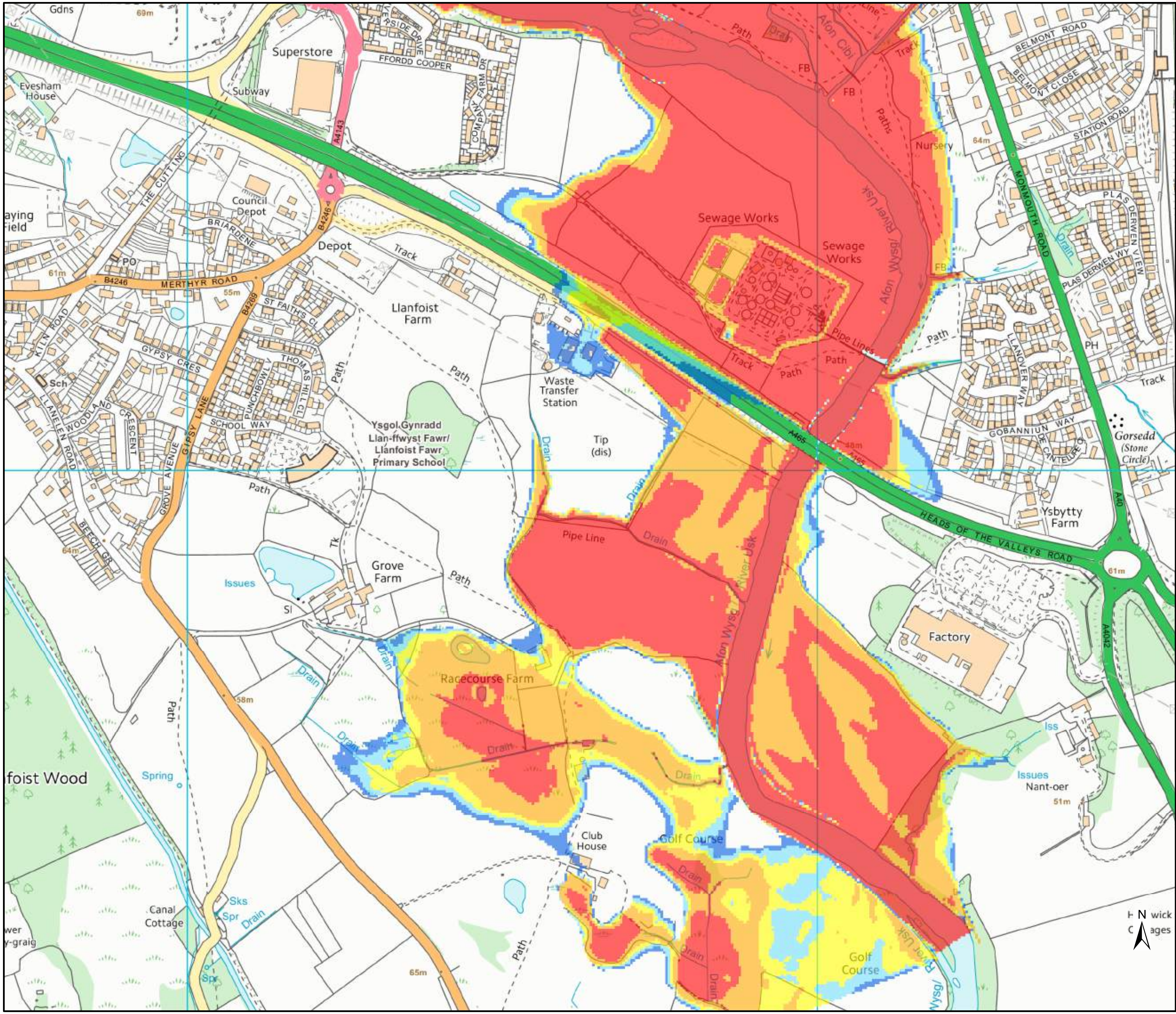
Project

Land at Llanfoist, Abergavenny, NP7 9HE [Ref: ATI-18883b]

Drawing

Figure 2:
Depth Grid for 1% AEP (1 in 100 + 20%) year event plus Climate Change - defended

Date	06 Aug 2020
Scale	1:8,000


Superstore
Subway
FFORDD COOPER
Evesham House
Council Depot
Depot
Track
MERTHYR ROAD
B4246
A4143
B4269
Llanfoist Farm
Sewage Works
Sewage Works
Afon Wysg/ River Usk
Afon Cibi
Nursery
Waste Transfer Station
Tip (dis)
Ysgol Gynradd Llan-ffwyst Fawr/ Llanfoist Fawr Primary School
SCHOOL WAY
GIPSY LANE
GROVE AVENUE
Grove Farm
Issues
Pipe Line
Drain
A465
HEADS OF THE VALLEYS ROAD
MONMOUTH ROAD
BELMONT ROAD
STATION ROAD
GOBANNIUN WAY
Gorsedd (Stone Circle)
Ysbytty Farm
A40
A4042
Factory
Racecourse Farm
Club House
Golf Course
Golf Course
Nant-oer
Spring
Canal Cottage
foist Wood
Path
N

Legend

Q1000 Depth (m)

- 0 - 0.3
- > 0.3
- > 0.6
- > 1.0
- > 2.0

Cyfoeth Naturiol Cymru
Natural Resources Wales

Project

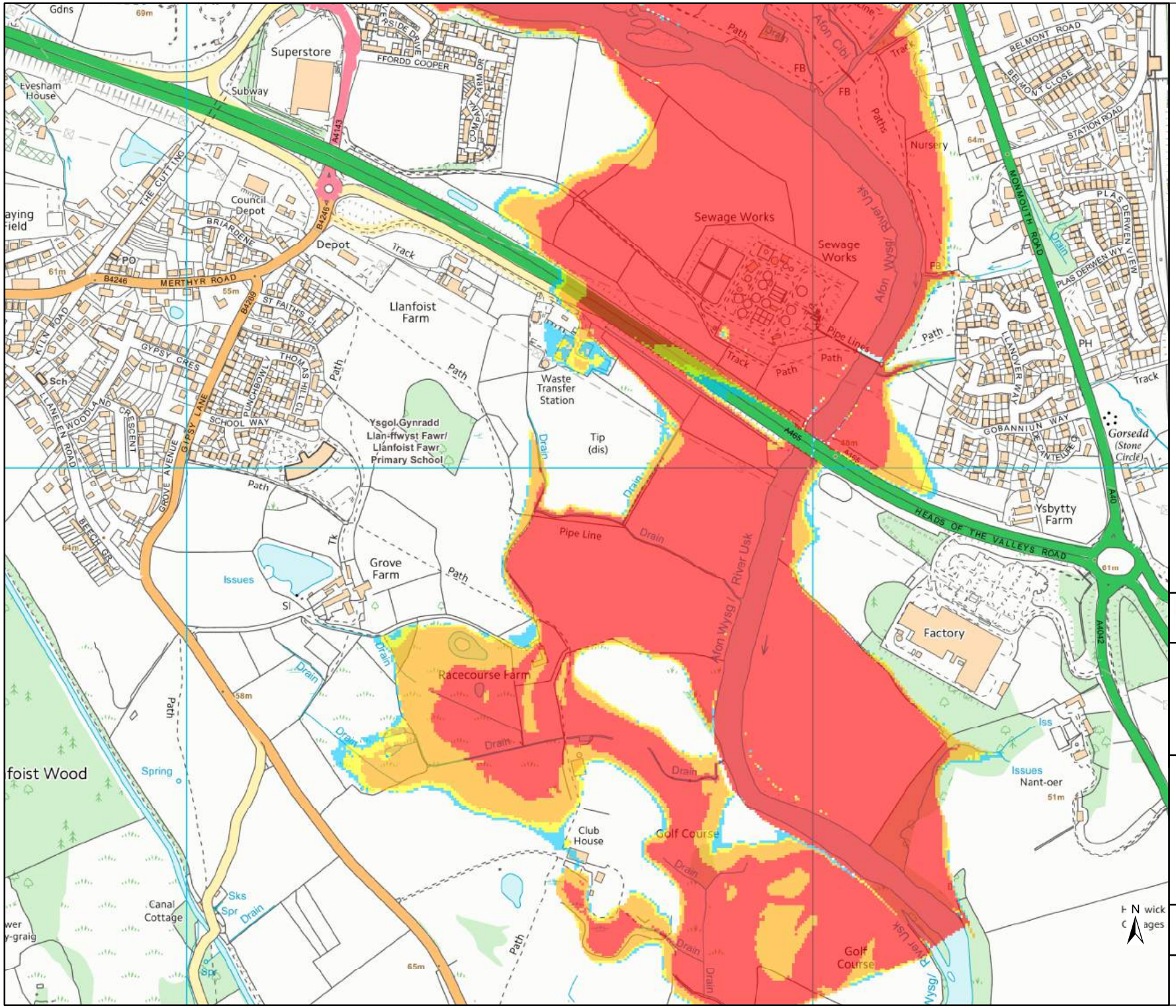
Land at Llanfoist, Abergavenny, NP7 9HE [Ref: ATI-18883b]

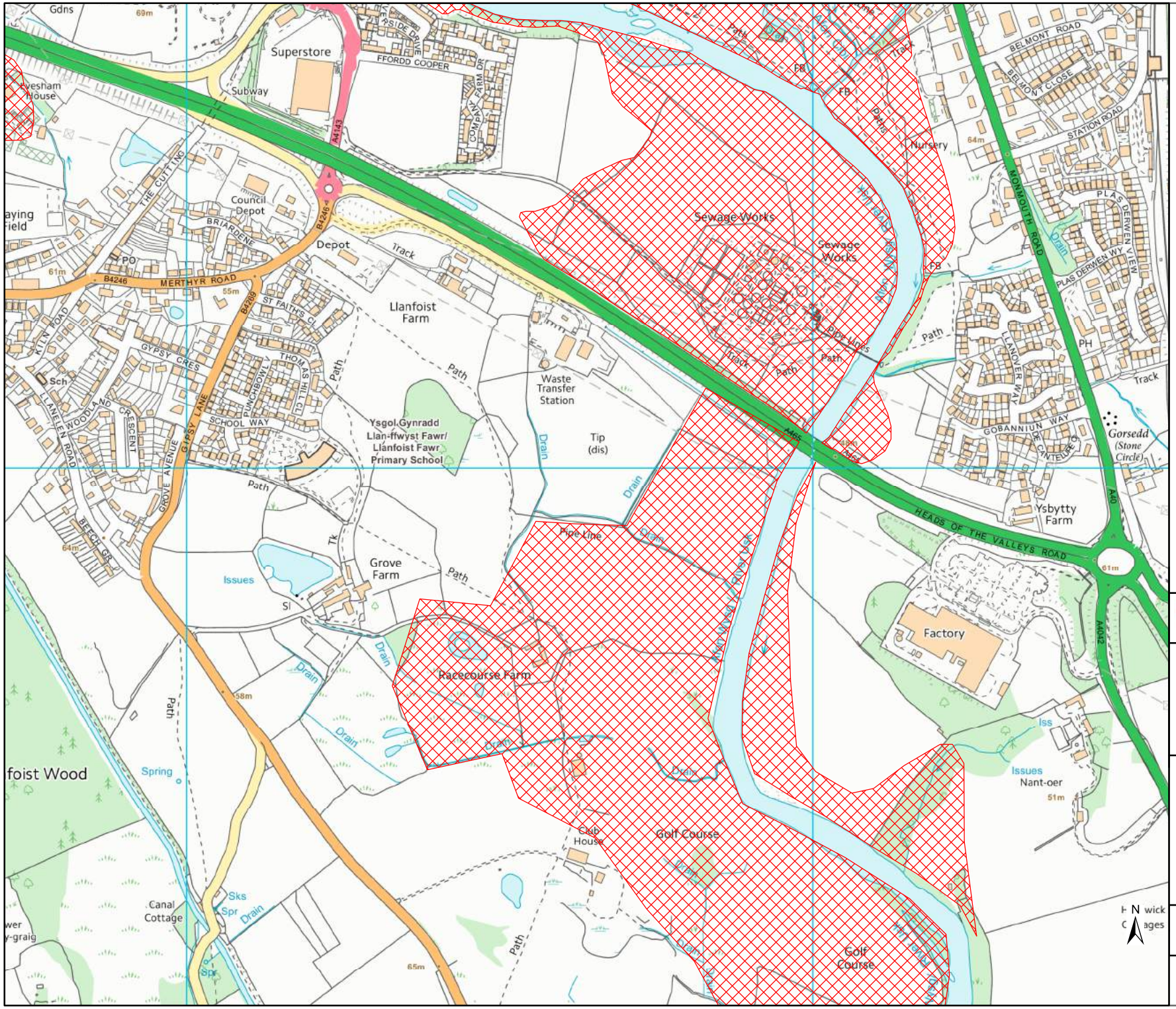
Drawing

Figure 3:
Depth Grid for 0.1% AEP (1 in 1000) year event - defended

Date 06 Aug 2020

Scale 1:8,000


Legend
Q1000 Hazard
< 0.75
0.75 - 1.25
1.25 - 2.0
> 2.0
Cyfoeth Naturiol Cymru
Natural Resources Wales
Project
Land at Llanfoist, Abergavenny, NP7 9HE [Ref: ATI-18883b]
Drawing
Figure 4:
Hazard Grid for 0.1% AEP (1 in 1000) year event - defended
Date
06 Aug 2020
Scale
1:8,000



Legend

Historic Flood Map

Cyfoeth Naturiol Cymru
Natural Resources Wales

Project

Land at Llanfoist, Abergavenny, NP7 9HE [Ref: ATI-18883b]

Drawing

Figure 5:
Historic Floodmap
[v202001]

Date 06 Aug 2020

Scale 1:8,000

Appendix 2

Proposed Site Layout

A1
ORIGINAL
PLOT SIZE

2.4m x 25m
2.4m x 17m
5.5m access road with asphalt concrete finish
Cycle parking (6 no. Sheffield stands)
3 no. shipping containers for secure storage
30m x 3m cellular gravel hardstanding warm up area
Cycle parking (4 no. Sheffield stands)
Car parking (cellular gravel) - 80 spaces including10 disabled and 11 longer spaces to accommodate vans
Cycle parking (6 no. Sheffield stands)
Cutting slope 1:2 along this section
Cut through
Cut through
Embankment slope 1:2 along this section
50m long 3m wide hardstanding
Start / finish line
250m start / finish straight
Potential overspill parking within field for large events (approx. 110 spaces)
Potential overspill parking within field for large events (approx. 210 spaces)

Key

- 6m offset either side of HP gas main to denote assumed extents of easement (to be confirmed with Wales & West Utilities). Works within the gas main easement are to be agreed with WWU and undertaken strictly in accordance with the guidelines and supervision.
- High voltage overhead cables (approximate outline). Works within the vicinity to be undertaken strictly in accordance with National Grid guidance and supervision.
- Approximate route of foul sewers
- Approximate extent of Flood Zone 2
- Approximate extent of Flood Zone 3
- Approximate route of existing PROW from Monmouthshire CC mapping
- Proposed diverted route for PROW
- Proposed footway / cycleway link to Westgate site (3m wide)
- Application boundary

Rev	Date	Details	Drawn by	Checked by
-	-	-	-	-

COTSWOLD TRANSPORT PLANNING

CLIENT:
Monmouthshire County Council

PROJECT:
Abergaveny Velo Park

TITLE:
Track Layout and Levels

STATUS:
INFORMATION

SCALE:	DATE:	DRAWN:	CHECKED:	APPROVED:
1:1000	15.01.20	LG	MP	MP

JOB NO:	DRAWING NO:	REVISION:
CTP-19-147	SK01	E

INDICATIVE

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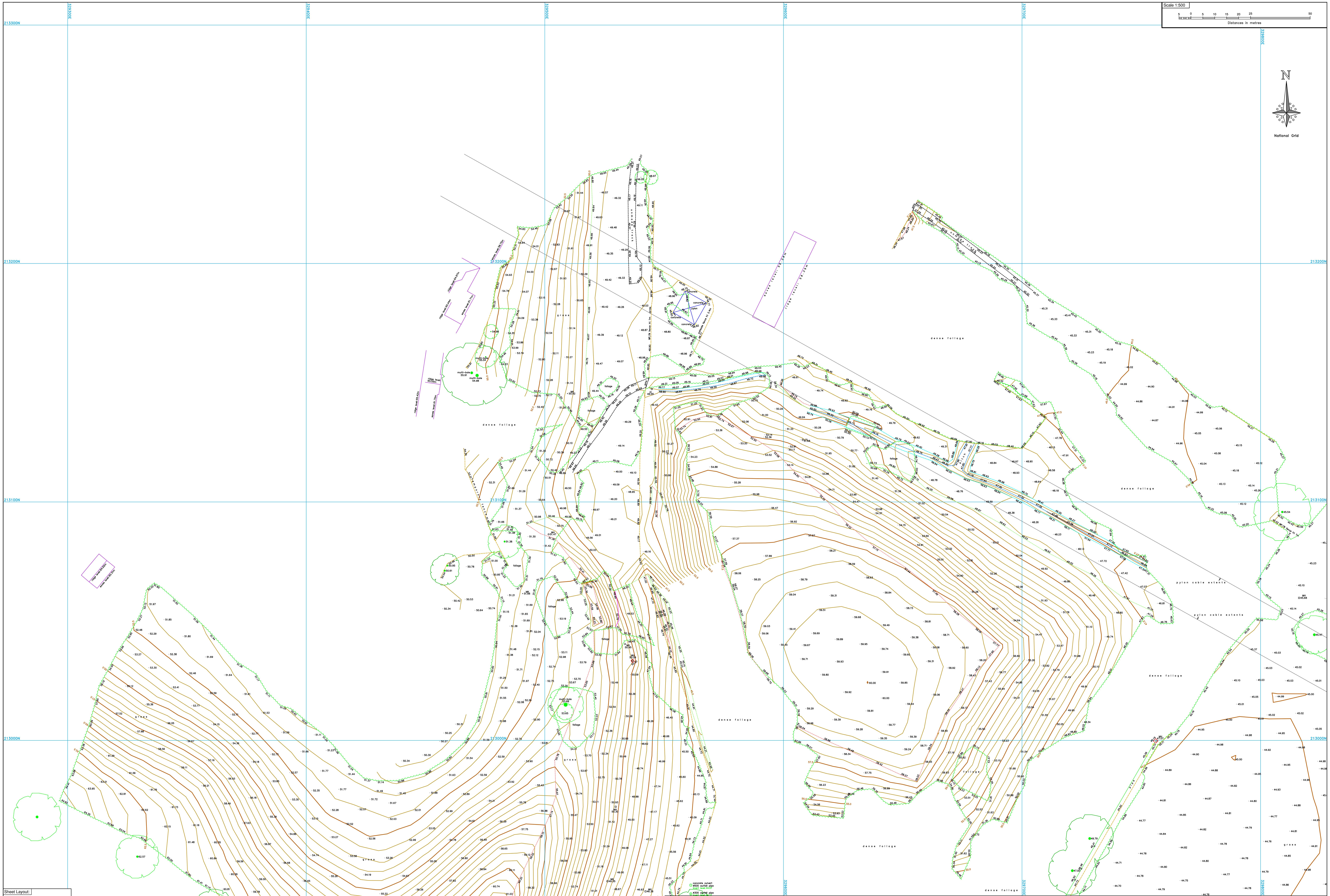
Appendix 3

Topographical Survey



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Notes:

Revisions:

- Topographical Surveys
- Engineering Surveys
- Measured Building Surveys
- Boundary Surveys
- OS Mapping and Data Centre
- Underground Utility Surveys

ALS

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Racecourse Farm
Abergavenny

Topographical Survey - Sheet 1 of 3

Client	Monmouthshire County Council						
Coord Grid	Plane Grid based on National Grid			Level Datum	Level Datum via Active GPS Network		
Scale	1:500@A0	Date	Aug 2018	Status	Final	Job No.	MC3479
Surveyed	A. G.	Drawn	M. F. Watkins	Checked	C. J. Sullivan	Dwg. No.	MC3479-01

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Planning Maps - Vector Mapping - Raster Mapping
Aerial Imagery - Historical Mapping
Environmental Data - Land Registry Title Plans

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Abbreviations:

B/RW	brick retaining wall
BB	Belisha beacon
BI	bollard (illuminated)
BL	bollard
BT	telecom inspection cover
BW	brick wall
C/RW	concrete retaining wall
CATV	cable television cover
CB	close boarded
CM	corrugated metal
conc.	concrete
CP/BW	concrete post & barbed wire
CP/CL	concrete post & chain link
CP/CP	concrete post & panel
CP/W	concrete post & wire mesh
CPS	concrete paving slabs
DC	drainage channel
DK	drop kerb
DR	drain
EP	electricity pole
ER	earthing rod
FB	flower bed
FFL	finished floor level
FS	flagstaff
G/W	gabion wall
GP	gate post
GV	gas valve
HR	handrail
HY	fire hydrant
IC	inspection cover (general)
IR	metal railings
Iwn	interwoven wood slat
JB	junction box
KO	kerb outlet
LP	lamp post
MH	manhole
MK	marker
MM	metal mesh
MP	mile post
NB	name board
O/H	overhead
OB	open boarded
OHC	overhead cable/wire
P/C	post & chain fence
PA	paling
PO	post
RE	rodding eye
RG	road gully
RP	reflector post
RS	road sign
RSJ	rolled steel joist
RWP	rain water pipe
S/RW	stone retaining wall
Sap.	sapling
SP	sign post
SPS	stone paving slabs
stay	stay wire
STN	survey control station
SV	water stop valve
SVP	soil vent pipe
tact.	tactile paving
THL	threshold level
TL	traffic light
TP	telephone pole
TV	cable tv
VP	vent pipe
Wlap	wood lap
WM	water meter
WP/BW	wood post & barbed wire
WP/R	wood post & rail
WP/W	wood post & wire
ht	height (of feature)
↑	arrow indicates up (unless otherwise stated)
▲9002	survey control point

Drainage features:

CL	cover level
ID	invert depth
IL	invert level
FWS	foul water sewer
SWS	storm water sewer
CWS	combined water sewer
UTD	unable to determine
UTL	unable to lift
ø	pipe diameter (mm)
SL	soffit level
←	arrow indicates direction of flow

Notes:

Revisions:

ALS

☐ Topographical Surveys
☐ Engineering Surveys
☐ Measured Building Surveys
☐ Boundary Surveys
☐ OS Mapping and Data Centre
☐ Underground Utility Surveys

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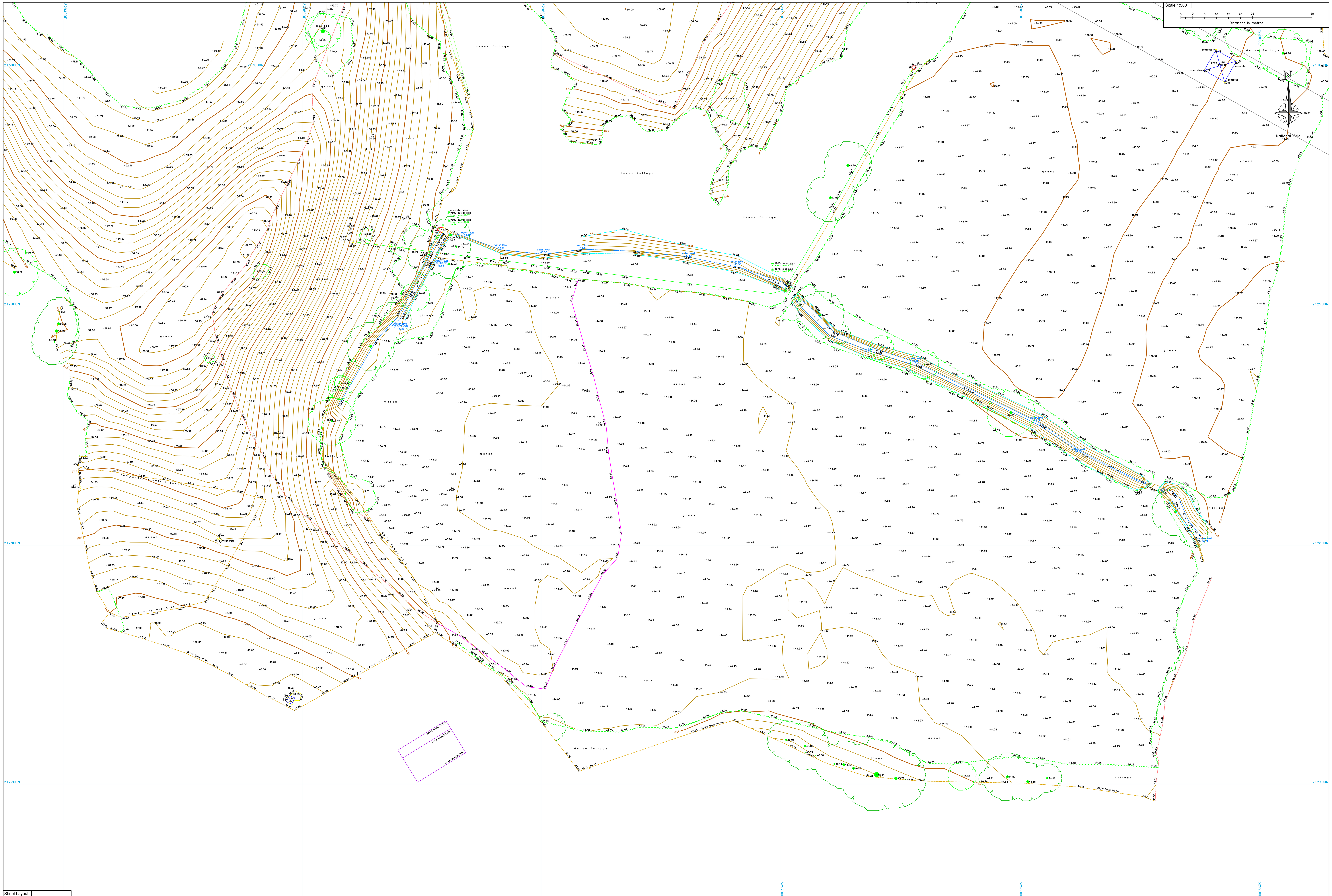
Racecourse Farm
Abergavenny

Topographical Survey - Sheet 2 of 3

Client	Monmouthshire County Council						
Coord Grid	Plane Grid based on National Grid			Level Datum	Level Datum via Active GPS Network		
Scale	1:500@A0	Date	Aug 2018	Status	Final	Job No.	MC3479
Surveyed	A. G.	Drawn	M. F. Watkins	Checked	C. J. Sullivan	Dwg. No.	MC3479-01



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Notes:

Revisions:

- Topographical Surveys
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Racecourse Farm
Abergavenny

Topographical Survey - Sheet 3 of 3

Client	Monmouthshire County Council						
Coord Grid	Plane Grid based on National Grid			Level Datum	Level Datum via Active GPS Network		
Scale	1:500@A0	Date	Aug 2018	Status	Final	Job No.	MC3479
Surveyed	A. G.	Drawn	M. F. Watkins	Checked	C. J. Sullivan	Dwg. No.	MC3479-01

Appendix 4

Public Sewer Plan

Dŵr Cymru
Welsh Water

Racecourse Farm, Llanfoist

N
W E
S

LEGEND(Representative of most common features)

Waste network:

- Foul chamber
- Surface water chamber
- Combined chamber
- Combined sewer overflow
- Special purpose chamber
- Treatment works
- Pumping station
- Outfall
- Lamphole
- Storm Overflow
- Rising main
- Gravity sewer
- Private sewer
- Private sewer subject to Sect. 104 adoption agreement
- Private Sewer Transfer
- Lateral Drain
- Inspection Chamber

NB: Sewer symbol colour indicates the type.
RED - Combined
GREEN - Surface Water
BROWN - Foul
Purple - Former S24 sewers (for indicative purposes only)

Notes:

Whilst every reasonable effort has been taken to correctly record the pipe material of DCWW assets, there is a possibility that in some cases pipe material (other than Asbestos Cement or Pitch Fibre) may be found to be asbestos cement (AC) or Pitch Fibre (PF) . It is therefore advisable that the possible presence of AC or PF pipes be anticipated and considered as part of any risk assessment prior to excavation

Dŵr Cymru Cyfyngedig ('the Company') gives this information as to the position of its underground apparatus by way of general guidance only and on the strict understanding that it is based on the best information available and no warranty as to its correctness is relied upon in the event of excavations or other works made in the vicinity of the company's apparatus. The onus of locating apparatus before carrying out any excavations rests entirely on you. The information which is supplied by the Company, is done so in accordance with statutory requirements of sections 198 and 199 of the Water Industry Act 1991 which is based upon the best information available and, in particular, but without prejudice to the generality of the foregoing, it should be noted that the records that are available to the Company may not disclose the existence of a water main, service pipe, sewer, lateral drain or disposal main and any associated apparatus laid before 1 September 1989, or, if they do, the particulars thereof including their position underground may not be accurate. It must be understood that the furnishing of this information is entirely without prejudice to the provision of the New Roads and Street Works Act 1991 and the Company's right to be compensated for any damage to its apparatus.

Service pipes are not generally shown but their presence should be anticipated.

EXACT LOCATIONS OF ALL APPARATUS TO BE DETERMINED ON SITE.

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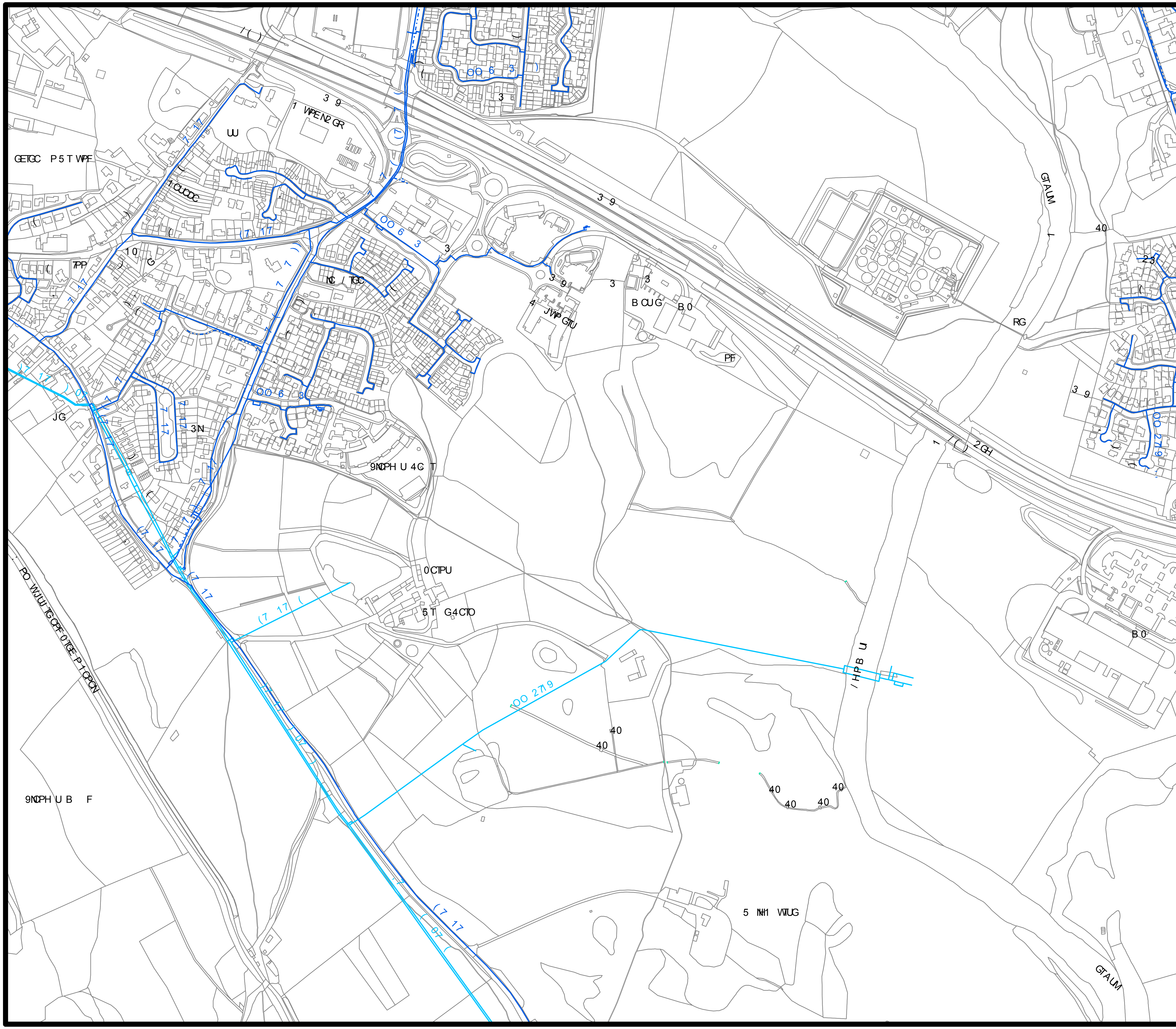
Map Ref:	329500,212915
Map scale:	1:4950
Printed by:	John Emma
Printed on:	27 Jan 2020



Dŵr Cymru
Welsh Water

N
W E
S

LEGEND

Clean network:

Sluice valve		Stop tap	
Pressure reducing valve		Water Treatment Works	
Meter		Water Pumping Station	
Bulk meter		Existing main	
Hydrant	FH	Non-operational main	
Cap end		Raw Water	
Air valve		NB: Water main symbol colour indicates the type.	

LIGHT BLUE - Trunk
DARK BLUE - Distribution
YELLOW - Raw Water

Notes:

EXACT LOCATIONS OF ALL APPARATUS TO BE DETERMINED ON SITE.

Appendix 5

Proposed Layout and Flood Zones

A1
ORIGINAL
PLOT SIZE

2.4m x 25m
2.4m x 17m
5.5m access road with asphalt concrete finish
Cycle parking (6 no. Sheffield stands)
3 no. shipping containers for secure storage
30m x 3m cellular gravel hardstanding warm up area
Cycle parking (4 no. Sheffield stands)
Car parking (cellular gravel) - 80 spaces including10 disabled and 11 longer spaces to accommodate vans
Cycle parking (6 no. Sheffield stands)
Cutting slope 1:2 along this section
Cut through
Cut through
Embankment slope 1:2 along this section
50m long 3m wide hardstanding
Start / finish line
250m start / finish straight
Potential overspill parking within field for large events (approx. 110 spaces)
Potential overspill parking within field for large events (approx. 210 spaces)

Key

- 6m offset either side of HP gas main to denote assumed extents of easement (to be confirmed with Wales & West Utilities). Works within the gas main easement are to be agreed with WWU and undertaken strictly in accordance with the guidelines and supervision.
- High voltage overhead cables (approximate outline). Works within the vicinity to be undertaken strictly in accordance with National Grid guidance and supervision.
- Approximate route of foul sewers
- Approximate extent of Flood Zone 2
- Approximate extent of Flood Zone 3
- Approximate route of existing PROW from Monmouthshire CC mapping
- Proposed diverted route for PROW
- Proposed footway / cycleway link to Westgate site (3m wide)
- Application boundary

Rev	Date	Details	Drawn by	Checked by
-	-	-	-	-

COTSWOLD TRANSPORT PLANNING

CLIENT:
Monmouthshire County Council

PROJECT:
Abergaveny Velo Park

TITLE:
Track Layout and Levels

STATUS:
INFORMATION

SCALE:	DATE:	DRAWN:	CHECKED:	APPROVED:
1:1000	15.01.20	LG	MP	MP

JOB NO:	DRAWING NO:	REVISION:
CTP-19-147	SK01	E

INDICATIVE

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Appendix 6

Cut and Fill in Flood Zones

A1
ORIGINAL
PLOT SIZE

Site boundary
Flood zone 2
Flood zone 3
Compensation parcel boundary

Rev	Date	Details	Drawn by	Checked by
-	-	-	-	-

COTSWOLD TRANSPORT PLANNING

CLIENT:
Monmouthshire County Council

PROJECT:
Abergaveny Velo Park

TITLE:
Flood Zone Compensation

STATUS:
INFORMATION

SCALE:	DATE:	DRAWN:	CHECKED:	APPROVED:
1:1000	14.10.20	LG	MP	MP

JOB NO:	DRAWING NO:	REVISION:
CTP-19-147	SK07	

INDICATIVE

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