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Traston Lane, Newport Flood Consequence Assessment

Version 1

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Contract

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Abbreviations

AEP	Annual Exceedance Probability
AOD	Above Ordnance Datum
BGS	British Geological Survey
FCA	Flood Consequence Assessment
FFL	Finished Floor Level
FMfP	Flood Map For Planning
FRMP	Flood Risk Management Plan
LDP	Local Development Plan
LiDAR	Light Detection And Ranging
NGR	National Grid Reference
NRW	Natural Resources for Wales
OS	Ordnance Survey
OS NGR	Ordnance Survey National Grid Reference
PPW	Planning Policy Wales
SMP	Shoreline Management Plan
TAN-15	Technical Advice Note 15

1 Introduction

1.1 Terms of Reference

JBA Consulting were commissioned by Lisa Way on behalf of Bron Afon Community Housing to undertake a Flood Consequence Assessment (FCA) to support a planning application for 26 residential dwellings, new access works and a new pumping station at Traston Lane, Newport (hereafter referred to as 'the site').

The following FCA supersedes an earlier FCA prepared by PHG Consulting Engineers. This new FCA has been prepared to address concerns raised by Natural Resources Wales (NRW), in their response dated 1st May 2025 (ref. CAS-278776-C6L3). Specifically, this FCA introduces new flood modelling data.

1.2 FCA Requirements

This FCA follows Welsh Government guidance on development and flood risk set out in Technical Advice Note 15: Development and Flood Risk (TAN-15). TAN-15 states that:

'The prime objective of a Flood Consequences Assessment is to develop a full appreciation of:

- The risks and consequences of flooding on the development; and
- The risk and consequences (i.e the overall impacts) of the development on flood risk elsewhere.'

To achieve this, the FCA should establish if suitable avoidance and mitigation measures can be incorporated, in a manner compatible with the placemaking aims of Planning Policy Wales, within the site design to ensure that development is 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 the sustainable management of natural resources.

2 Study Description

2.1 Site Summary

The site is located on land to the south of Traston Lane, Newport, as shown in Figure 2-1.

The site is bound by an unnamed ordinary watercourse to the north and south of the site boundary. To the North of the site is Southern Distributor Road (A48) and the Great Spytty Reen watercourse, east of the site is Nash Road, and Liswerry High School, and west of the site is the River Usk and Langland Way Reevesland Industrial Estate. The River Usk is designated as a Main River by Natural Resources Wales (NRW) and flows in a southerly direction, meeting the Severn Estuary to the south of the site. The Great Spytty Reen is designated by NRW as a Main River.

The site is within an established residential area. Table 2-1 summarises the details of the site.

Table 2-1 Summary of site details

Site Location	Traston Lane, Newport
Site area	0.77 ha
Existing site use	Greenfield site
OS NGR	ST 33730 86326
County	Newport
Country	United Kingdom
Local Planning Authority	Newport City Council
Lead Local Flood Authority	Newport City Council



Figure 2-1 Site Location

2.2 Site topography

A topographic survey has been provided by the client and is included in Appendix A. The topographic survey shows that the site is largely level across the site, with the lowest levels in the eastern part of the site at 5.90m AOD. Levels across the rest of the site range between 6.03m AOD and 6.11m AOD.

In Figure 2-2 NRW 1m Light Detection and Ranging (LiDAR) data¹ shows the general elevation of the site and the surrounding area.

¹ <https://datamap.gov.wales/maps/lidar-data-download/>

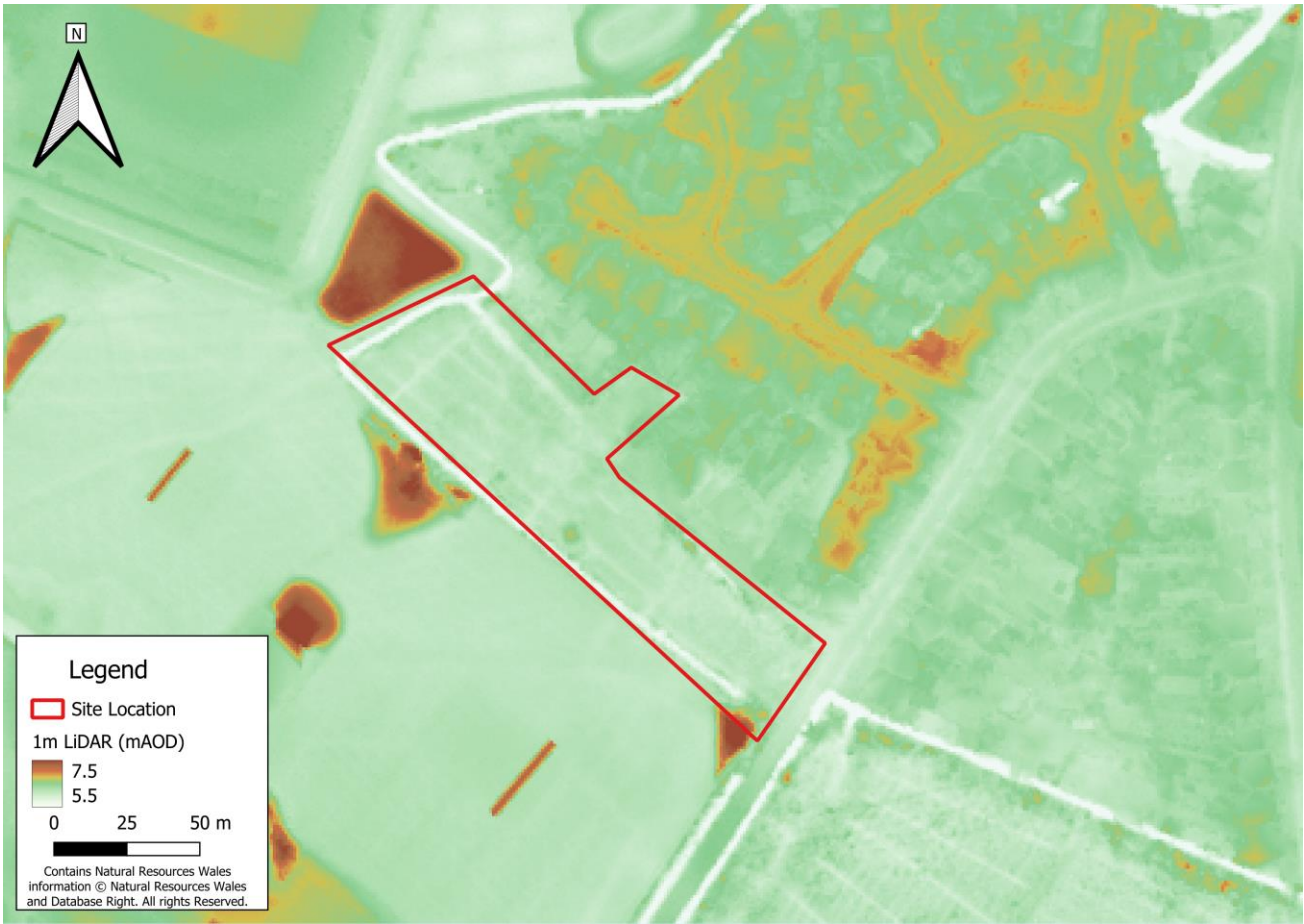


Figure 2-2 LiDAR Digital Terrain Model

2.3 Watercourses and flood defences

There is an unnamed ordinary watercourse that flows around the northern and western boundary of the site, shown in Figure 2-3. The site is located 229 metres east of the Great Spytty Reen, 1.6km metres east of the River Usk and 4.5km metres north of the Severn Estuary. The Great Spytty Reen and River Usk are designated by NRW as Main River's. The location of the Great Spytty Reen and River Usk in relation to the site is shown in Figure 2-4. The River Usk's source is in the western part of the Brecon Beacons in the Black Mountains. The Usk flows in a southerly direction from Abergavenny towards Newport where it meets the Severn Estuary at its mouth. The location of the Severn Estuary is shown in Figure 2-5.

The River Usk is tidally influenced. Flood defences are located on the eastern bank of the River Usk and protect the site from tidal flooding. Much of the area is managed by NRW as part of the Gwent Levels Internal Drainage District, meaning that water levels are actively managed in the area.

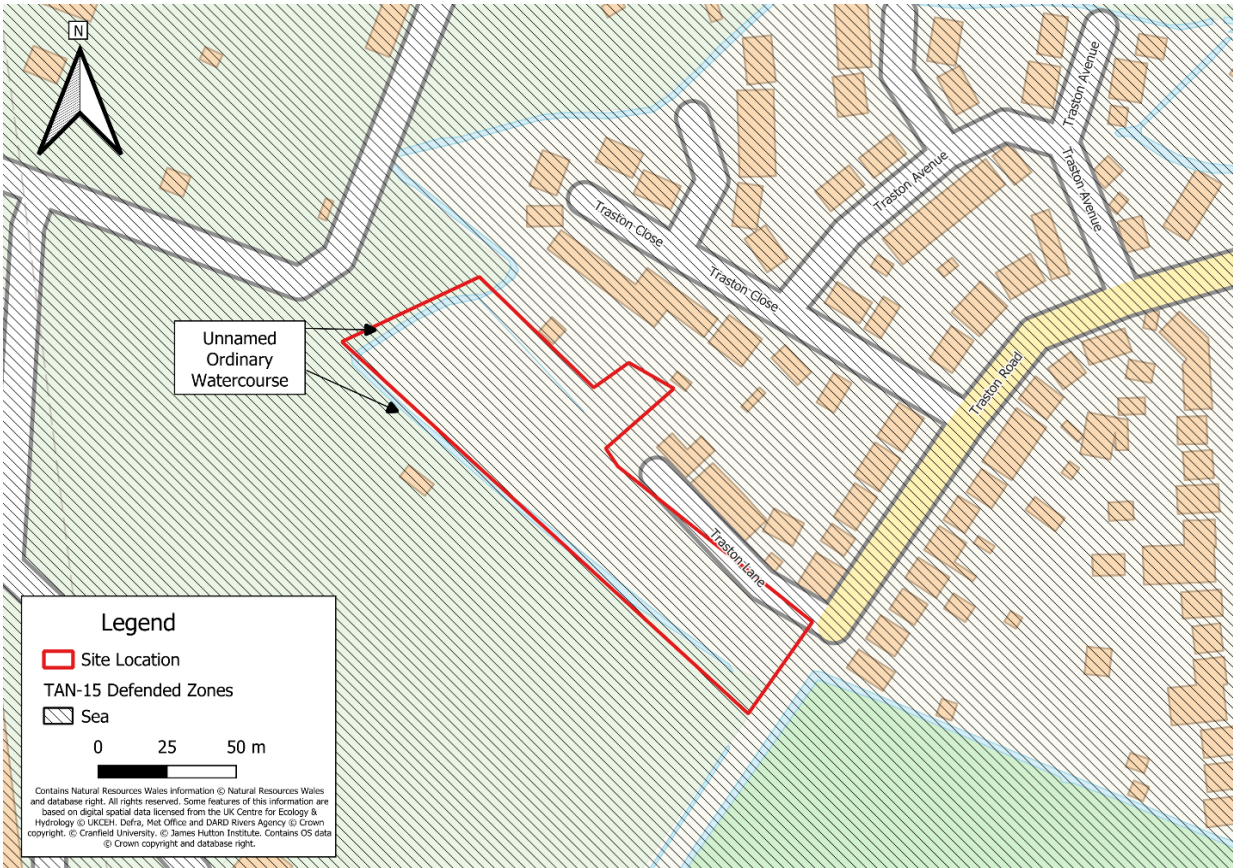


Figure 2-3 Watercourses on site

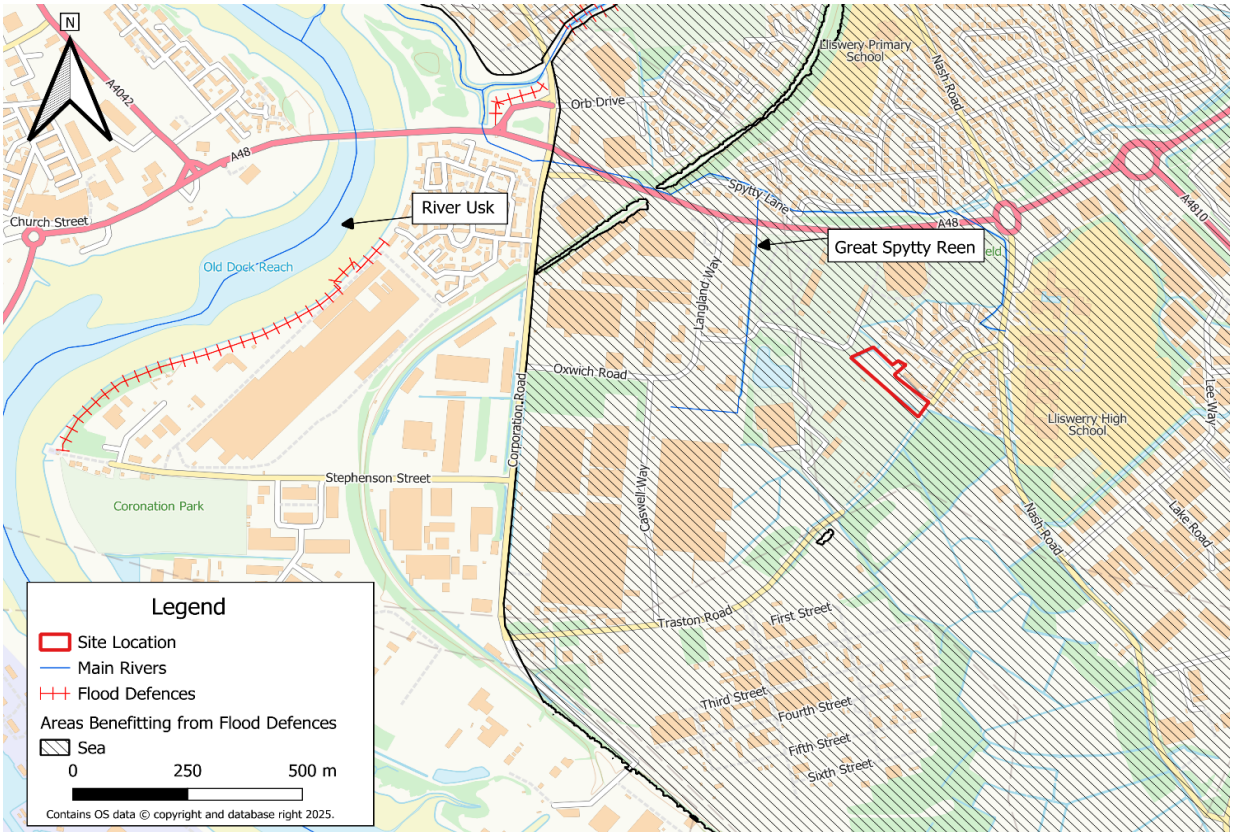


Figure 2-4 Watercourses and flood defences near to the site

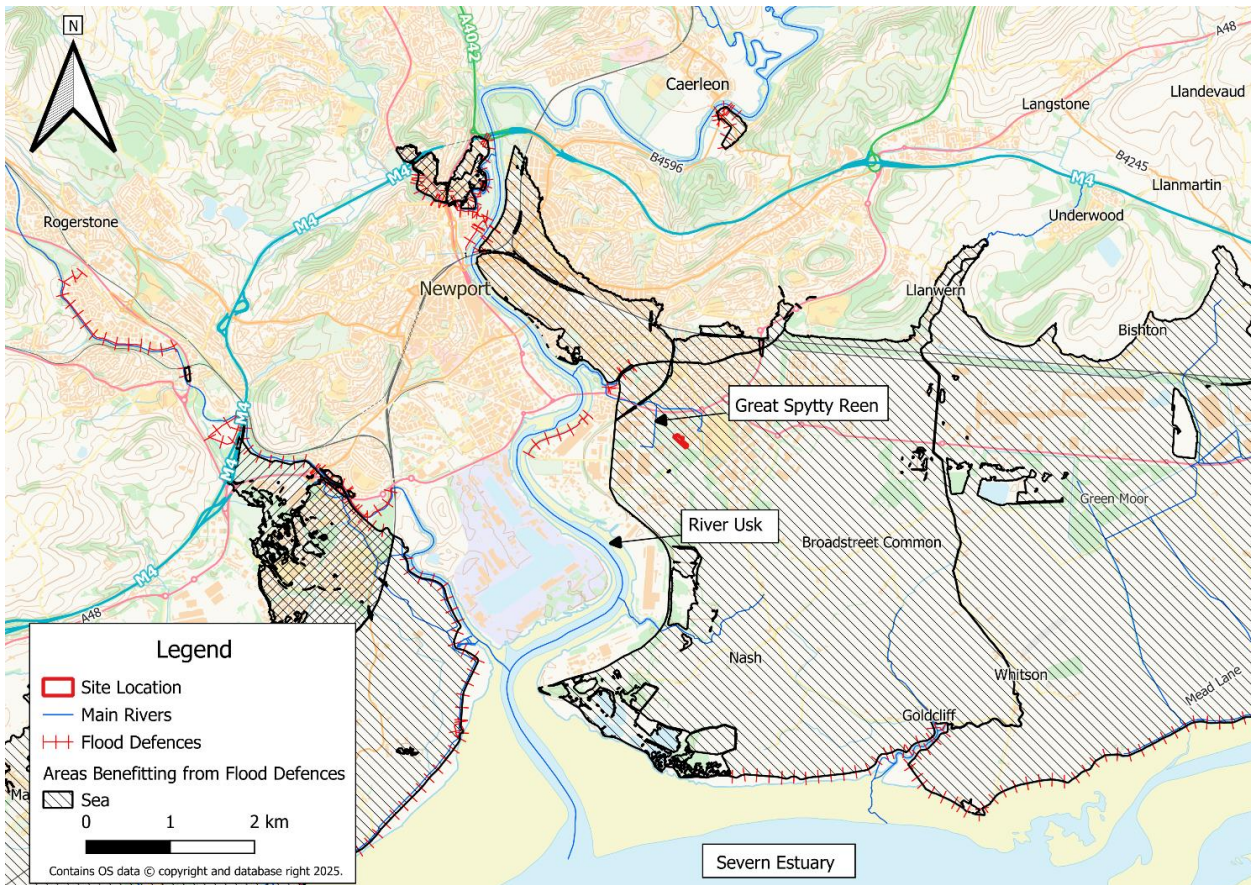


Figure 2-5 Watercourses and flood defences

2.4 Soils and Geology

The geology has been ascertained by reference to the British Geological Survey (BGS) website. British Geological Survey (BGS) data indicates that the site is underlain by mudstone part of the mercia mudstone group. The superficial deposits present at the site include clay and silt which are Tidal Flat Deposits.

The soils have been determined from the Cranfield University Soilscape Viewer² and are described as loamy and clayey soils of coastal flats with naturally high groundwater.

2.5 Development Proposal

The proposed development is for 26 residential dwellings, new access works and an associated pumping station. The proposed site layout is included in Appendix B and an extract of the proposed site layout is shown in Figure 2-6 below.

The residential buildings will have a finished floor level of 7.43m AOD and the ground levels including the front of the properties will be raised to 7.23m AOD and rear of the properties will be raised to 7.28m AOD. The access road through the site will be approximately vary in elevation between 6.20m AOD and 7.20m AOD.

² [LandIS - Land Information System - Soilscape soil types viewer](#)



Figure 2-6 Proposed site plan

3 Planning Policy and Flood Risk

3.1 Planning Context

Planning Policy Wales (PPW)³ sets out the land use planning policies of the Welsh Government. It is supplemented by a series of Technical Advice Notes (TANs), Welsh Government Circulars, and policy clarification letters, which, together with PPW, provide the national planning policy framework for Wales. These policies aim to make all development in Wales sustainable and improve the social, economic, environmental, and cultural wellbeing of Wales as set out in the Wellbeing of Future Generations Act 2015.

Technical Advice Note 15 (TAN-15)⁴, originally introduced by the Welsh Government in 2004 and most recently updated in March 2025, provides technical guidance relating to development planning and flood risk in Wales. TAN-15 provides a framework within which the flood risks arising from rivers, the sea and surface water, and the risk of coastal erosion can be assessed. The approach set out in the most recent update to TAN-15 ensures flooding and coastal erosion are accorded appropriate consideration in plan making and development management decisions.

3.2 Form of Development

TAN-15 recognises two key forms of development. New development and redevelopment. The definition of both terms is provided in Table 3-1.

Table 3-1 Form of Development

Form of Development	Definition
New Development	Any development on greenfield land
Redevelopment	Any development on previously developed land, as defined in Planning Policy Wales

The proposals are classified as new development, due to the greenfield nature of the site.

3.3 Vulnerability Classification

TAN-15 assigns one of three flood risk vulnerability classifications to developments, as shown in Table 3-2. The proposed development best aligns with the Highly Vulnerable Development classification for residential premises.

³ [Planning policy Wales | GOV.WALES](#)

⁴ [Technical advice note \(TAN\) 15: development, flooding and coastal erosion | GOV.WALES](#)

Table 3-2 TAN-15 Vulnerability Classification

Development category	
Highly vulnerable development	<p>All residential premises (including hotels, Gypsy and Traveller sites, caravan parks and camping sites).</p> <p>Schools and childcare establishments, colleges and universities. Hospitals and GP surgeries.</p> <p>Especially vulnerable industrial development (e.g. power generating and distribution elements of power stations, transformers, chemical plants, incinerators), and waste disposal sites.</p> <p>Emergency services, including ambulance stations, fire stations, police stations, command centres, and emergency depots.</p> <p>Buildings used to provide emergency shelter in time of flood.</p>
Less vulnerable development	<p>General industrial, employment, commercial and retail development. Transport and utilities infrastructure.</p> <p>Car parks.</p> <p>Mineral extraction sites and associated processing facilities (excluding waste disposal sites).</p> <p>Public buildings including libraries, community centres and leisure centres (excluding those identified as in Highly Vulnerable category and emergency shelters).</p> <p>Places of worship.</p> <p>Cemeteries.</p> <p>Equipped play areas. Renewable energy generation facilities (excluding hydro generation).</p>
Water Compatible Development	<p>Boatyards, marinas and essential works required at mooring basins.</p> <p>Development associated with canals.</p> <p>Flood defences and management infrastructure. Open spaces (excluding equipped play areas).</p> <p>Hydro renewable energy generation.</p>

3.4 Lifetime of development

Section 10.28 of TAN-15 advises that "*Generally, it is appropriate to think of new dwellings as having a lifetime of 100 years.*"

The proposed development is for 26 residential dwellings, which is a highly vulnerable development. In accordance with the guidance, a 100-year lifetime has been considered in this assessment.

3.5 Local Development Plan

The Local Development Plan (LDP) is a land-use document in which the council sets out its land use development over a 15-year period. The current LDP for Newport was adopted in 2015⁵ and provides a framework to guide future development and set out where, when, and how much new development can take place within the plan period (2011-2026).

Within the LDP, Objective 4 states that Newport aims to deliver approximately 10,350 new homes. The proposed development, therefore, supports this key objective by providing new dwellings, which will contribute to the number of homes required by the LDP.

The site has been allocated in the adopted local development plan as having extant planning permission for 21 residential units. This is identified in Table H1 under reference H23 in Newport's local development plan (2011-2026).

3.6 Severn Estuary Shoreline Management Plan

The site is located within the Newport, River Usk Theme area of the Severn Estuary SMP in Figure 3-1. The site is within Management Unit NEW 5 - River Usk (East bank). This management unit has a Hold the Line policy for the 50-100-year epoch (year 2105).

Hold the line is defined as "keeping the line of defence in approximately its current location. This may mean repairing or replacing defences".

⁵ <https://www.newport.gov.uk/en/Planning-Housing/Planning/Planning-policy/Local-Development-Plan/Local-Development-Plan.aspx>

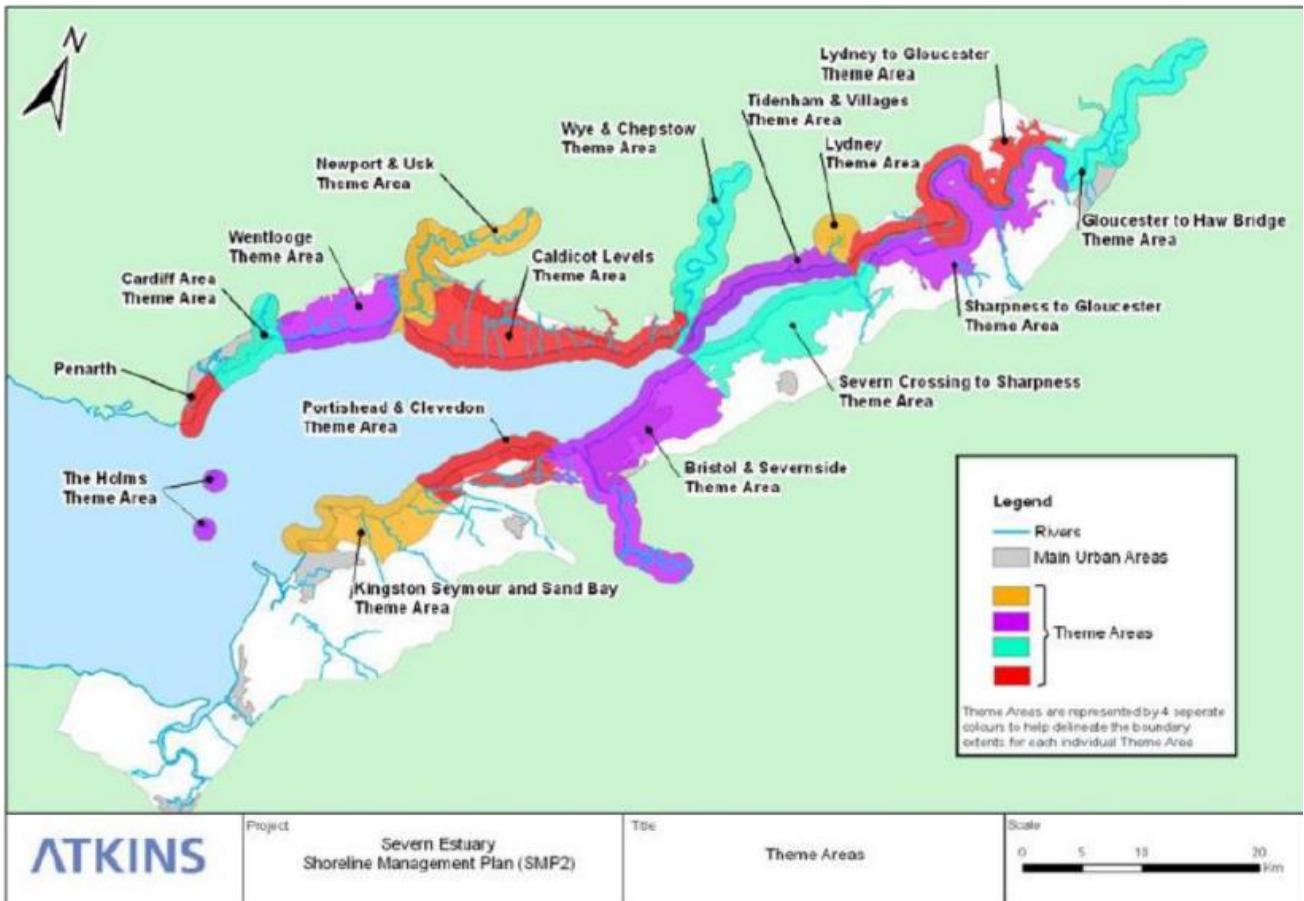


Figure 3-1 Theme Areas - Severn Estuary Shoreline Management Plan

3.7 Flood Map for Planning Classifications

The Flood Map for Planning (FMfP) is the starting point for the consideration of flood risk in the planning system. The map uses flood zones to indicate the degree to which land is at risk of flooding from rivers, the sea, surface water and small watercourses. The main zones are Flood Zone 1, Flood Zone 2, Flood Zone 3 and the Defended Zone. The FMfP displays predicted future flood risk with an allowance made for climate change.

Proposals for development located partially or wholly in Flood Zone 2 or 3 must be supported by a Flood Consequences Assessment (FCA).

3.7.1 Flood Map for Planning- Rivers

The site is located in Flood Zone 1 for Rivers, as shown in Figure 3-2. Flood Zone 1 represents areas that have a less than 0.1% AEP (1 in 1000 year) chance of flooding.



Figure 3-2 Flood Map for Planning - Rivers

3.7.2 Flood Map for Planning - Sea

The site is located in a TAN 15 Defended Zone for the Sea, as shown in Figure 3-3. This indicates areas where flood risk management infrastructure provides a minimum standard of protection against flooding from the sea up to the 1 in 200-year event.

This source of flood risk is assessed in more detail in [Section 5](#) of the FCA.



Figure 3-3 Flood Map for Planning - Sea

3.7.3 Flood Map for Planning- Flood Risk from Surface Water and Small Watercourses

The site is predominantly located in Flood Zone 1 of flood risk from surface water and small watercourses, as shown in Figure 3-4. Small areas around the edge of the site, following the unnamed watercourse, are located in Flood Zone 2.

Flood Zone 1 represents areas that have a less than 0.1% AEP (1 in 1000 year) chance of flooding from surface water or small watercourses. Flood Zone 2 indicates areas which have a less than 1% AEP but greater than 0.1% AEP chance of surface water flooding in any given year, including climate change.

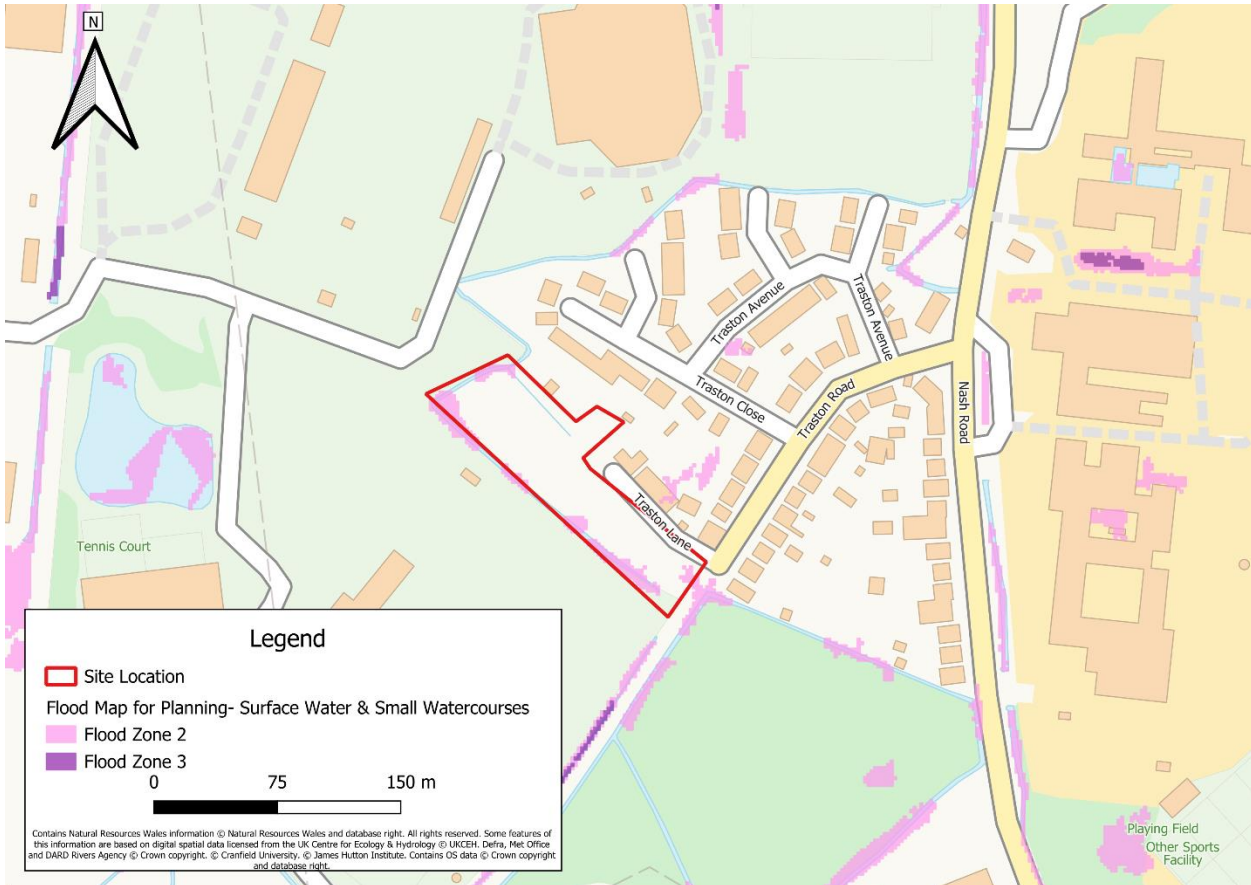


Figure 3-4 Flood Map for Planning- Surface Water & Small Watercourses

4 Flood Risk Assessment

This section assesses the risk to the proposed development from all sources of flooding, the risk of increased flooding to others because of the proposed development, and how flood risk can be managed. This section of the FCA is based solely on desk-based analysis of existing flood risk data.

4.1 Summary of Flood Risk

A summary of flood risk at the site is summarised in Table 4-1 below

Table 4-1 Summary of flood risk

Source of Flooding	Onsite Presence	Risk / Description
Flood Risk from Rivers	✘	Very Low - Located in an area at very low risk of river flooding
Flood Risk from the Sea	✓	Refer to Chapter 5 for a detailed assessment
Flood Risk from Surface Water and Small Watercourses	✓	Low - The site is at low risk of surface water flooding.
Flood Risk from Groundwater	✘	Very Low - The site is at low risk of flooding from groundwater.
Flood Risk from Reservoirs	✓	Very Low - The site is at low risk of flooding from reservoirs.
Flood Risk from Sewers	✘	Low - The site is at low risk of flooding from sewers.

4.2 Historical Flooding

NRW's map of recorded flood extents shows that there is no record of historic flooding on the site.

Newport City Council's Preliminary Flood Risk Assessment⁶ and Flood Risk Management Strategy identified no other historic flooding records at the site.

4.3 Flood Risk from Rivers

Flood risk should be considered for a site with appropriate consideration for climate change. Within the available NRW datasets, it is considered that the FMfP provides the most up-to-date assessment of flood risk, with an allowance for climate change included.

⁶ Newport City Council - Preliminary Flood Risk Assessment (2011). Retrieved from: <https://www.newport.gov.uk/documents/Planning-Documents/Flood-risk/PreliminaryFlood-Risk-Assessment-Report-April-2011.pdf>

As shown in Figure 3-2, the FMfP for Rivers shows that the development site is at very low risk of flooding from these sources (i.e. Flood Zone 1). This means there is a less than 1 in 1000 (<0.1% AEP) chance of flooding in any given year, including with an allowance with climate change.

Therefore, the risk of flooding is concluded to be **very low**.

4.4 Flood Risk from Surface Water and Small Watercourses

The FMFP for Surface Water and Small Watercourses is informed by the National Flood Risk Assessment for Wales mapping, a national-scale mapping exercise undertaken in 2019. This modelling used the LiDAR data available at the time to identify the topographic levels across Wales. Surface water flooding is likely to be predicted in any topographical depression, as is the case on the western and southern parts of this site along the boundary of the unnamed ordinary watercourse.

As shown in Figure 3-4, the Flood Map for Planning Surface Water and Small Watercourses mapping shows that the proposed development site is predominantly at very low risk of flooding from these sources (ie. Flood Zone 1). This means that there is a less than 1 in 1000 (<0.1% AEP) chance of flooding in any given year, including with an allowance with climate change. Parts of the site are shown to be at risk of flooding (located in Flood Zone 2). This means that there between a 1 in 1000 (0.1% AEP) and 1 in 100 (1% AEP) chance of flooding in any given year, including an allowance with climate change.

The risk of surface water and small watercourse flooding will be further reduced by the proposed raising of the site and implementation of SuDS drainage. Consequently, the risk of flooding from this source will be **very low**.

4.5 Flood Risk from Groundwater

Groundwater flooding is caused when excess water emerges at the ground surface or within a manmade structure, such as a basement. The risk of groundwater flooding is determined by a site's geological strata and local topography. Groundwater flooding tends to be more persistent than surface water flooding, in some cases lasting for weeks of months, and can result in damage to property.

Newport City Council's Local Flood Risk Management Strategy⁷ (FRMP) notes 'groundwater is not considered to be a significant flood risk and is considered to rise and fall relatively slowly'.

The risk of surface water and small watercourse flooding will be further reduced by the proposed raising of the site. Consequently, the risk of groundwater flooding at the site shall be **very low**.

⁷ <https://www.newport.gov.uk/sites/default/files/media/media-documents/Easy%20read%20version%20-%20Newport%20Local%20Flood%20Risk%20Management%20Strategy%20v5.pdf>

4.6 Flood Risk from Reservoirs

The NRW FRAW Flood Risk from Reservoirs map illustrates that the site is at risk of flooding from reservoirs, as shown in Figure 4-1. The site is at risk of flooding from the Sloblands Lagoons located 3.3km south of the site.

However, as a result of regular inspections covered by the 1975 Reservoir Act, it is extremely unlikely that a reservoir would fail, and due to the location of the reservoirs in relation to the site, substantial warning time would be available. Furthermore, the partial flooding of the site suggests that flooding would be shallow and therefore eliminated by the proposed raising of the site. Therefore, the risk of reservoir flooding is considered to be **very low**.

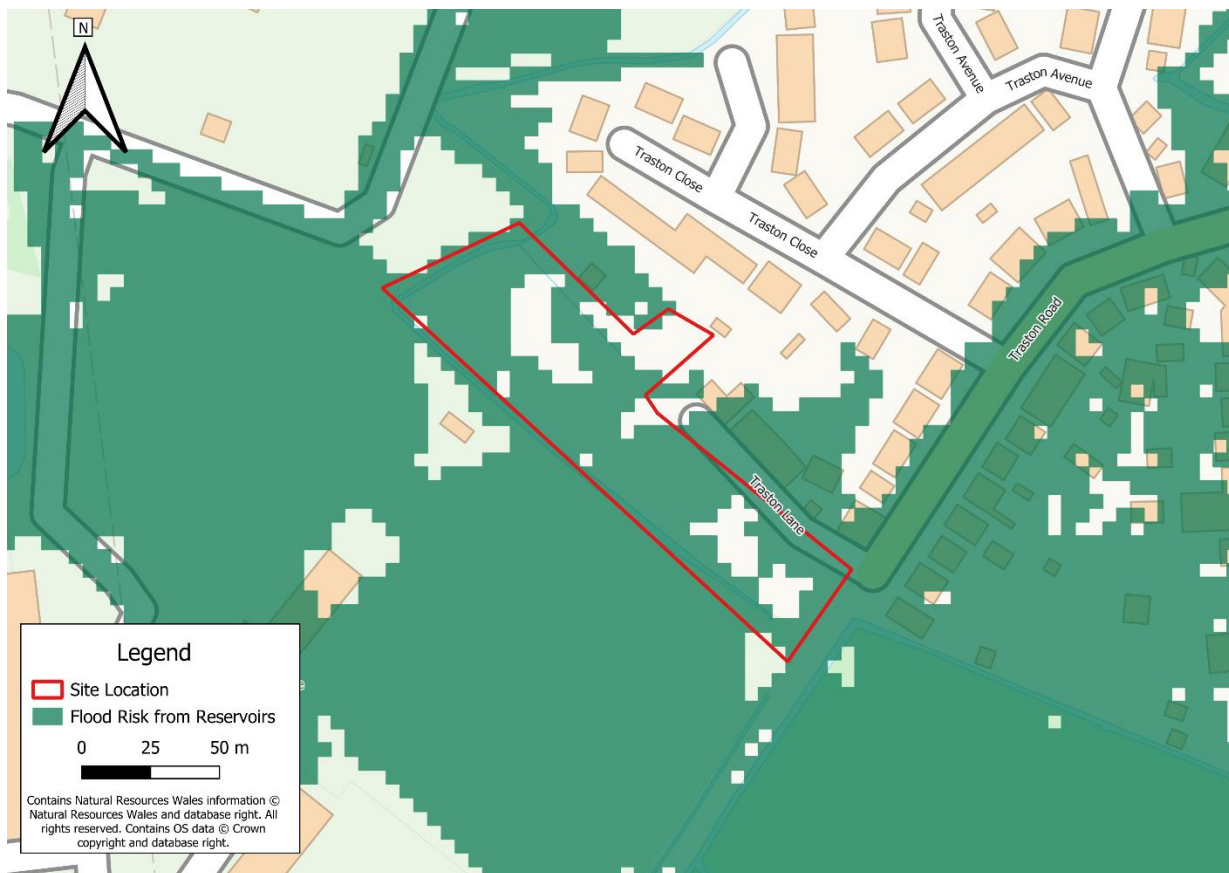


Figure 4-1 Risk of flooding from reservoirs

4.7 Flood Risk from Sewers

The Local Flood Risk Management Strategy notes 'DCWW maintains a register of historical property sewer flooding events which shows that there have been 417 incidents of localised sewer flooding within the borough'. No evidence is provided that the site has previously experienced sewer flooding. Therefore, it is concluded that the site has a **low** risk of flooding from sewers.

5 Detailed Tidal Flood Risk Assessment

As identified in Sections 3 and 4, the predominant source of flood risk to the site is from the sea (tidal). Therefore, to better understand the risk of tidal flooding posed to the site and the potential implications of climate change, further assessment using detailed hydraulic modelling is provided in this section.

5.1 Hydraulic modelling availability

Tidal flooding of the site can occur through two separate but associated flood mechanisms. The first is tidal flooding of the open coast; the second is tidal flooding of the River Usk. These two mechanisms have been separately modelled by NRW, although the extents of the models overlap and so does the modelling of the boundary conditions. Tidal flood risk from the Usk is modelled by the model 'Newport_5_V8.0_2022' and coastal modelling by 'CaldicotAndWentlooge_5_V1.0_2016'.

Both models have been inspected to identify which model provides the worst-case scenario for Traston Lane. This exercise concluded that greatest risk (depths) of flooding would be associated with flooding from the coast, as predicted by the Caldicot and Wentlooge Coastal Modelling Study.

The Caldicot and Wentlooge Coastal Modelling Study was developed by JBA for Natural Resources Wales (NRW) in 2016. The 2016 study generated detailed and comprehensive coastal flood risk modelling of the Caldicot and Wentlooge Levels. Specifically, the Caldicot model covers the southeast of Newport.

Since 2016 a range of datasets have changed, including LiDAR, climate change predictions and Coastal Boundary Conditions. Furthermore, the resolution of the model was inherently limited by the size of the model, introducing key modelling and flood risk definition limitations at the site of interest.

To facilitate a detailed assessment of flood risk the 2016 NRW flood model was updated to support this FCA (and others in the area). In summary, these updates and improvements included:

- Updates to the tidal boundary conditions utilising the latest version of the UK Coastal Flood Boundary Dataset⁸ (CFBD). The tidal boundary calculated assumes a 100 year lifetime of development. Given the period in which JBA has advised on site in the area, 2023 was set as the present-day year and 2123 for 100 years from now.
- Updates to Climate Change allowances to comply with the latest version of Welsh Government guidance⁹.

⁸ Coastal Design Sea Levels - Coastal Flood Boundary Extreme Sea Levels. Environment Agency, 2018

⁹ Flood Consequences Assessments: Climate change allowances. Welsh Government, 2021

- Updates to initial water levels within the model simulation.
- Update the model to the latest software version of TUFLOW.
- Updated breach modelling (see Section 5.3)

The model was used to simulate both the 0.5% and 0.1% AEP design events for 100 years of climate change (2123). Given the small scale of the development, the small total footprint of proposed buildings, and the tidal nature of the flooding event, the displaced volume of flooding and the impact of displaced water are expected to be negligible. Consequently, the proposed development has not been directly modelled, and the effectiveness of the proposed flood mitigation measures will be assessed from the baseline results.

The 2023 JBA model provides a substantial update to the 2016 NRW model. The results of this modelling are presented in the following sections

5.2 Detailed Tidal Model Results

5.2.1 2123 0.5% AEP plus climate change event with central estimate

During the 2123 0.5% AEP flood event with a central estimate for climate change applied the site is predicted to flood to a maximum level of 7.09m AOD. The flood depths during this flood event are shown in Figure 5-1 and Figure 5-2. The maximum flood depth on site (pre-development) is predicted to be 1.65m in the northwestern corner of the site adjacent to the unnamed watercourse.

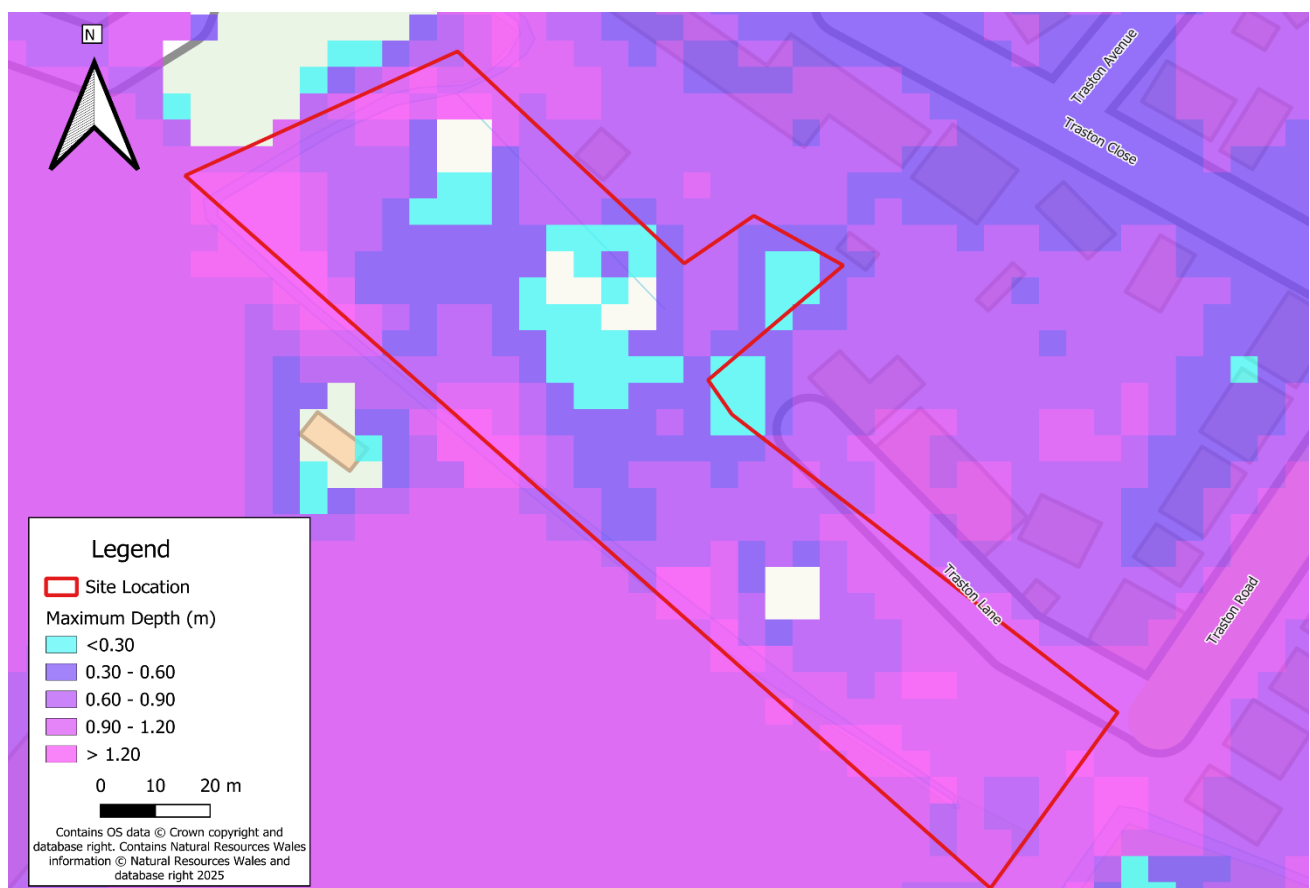


Figure 5-1 2123 0.5% AEP maximum flood depths

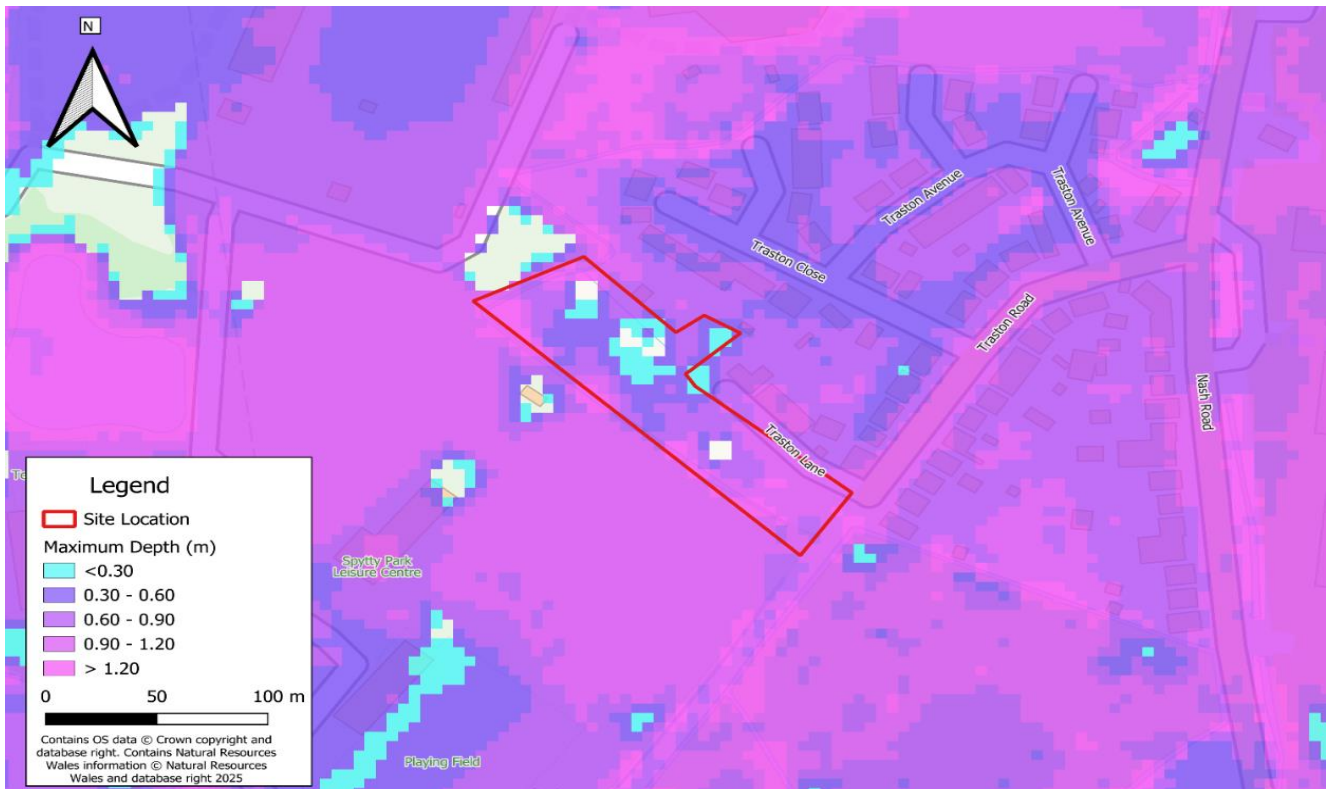


Figure 5-2 2123 0.5% AEP maximum flood depths zoomed out

As noted in Section 2.5, the proposed development site will be raised to reduce the risk of flooding. Table 5-1 post-development flood depths considers the predicted flood depths during the 2123 0.5% AEP event following development, demonstrating that the entire residential curtilage will be flood free in this event.

As the proposed dwellings will remain flood-free in this design event, the proposed development satisfies the requirements of Figure 5 of TAN-15.

Table 5-1 post-development flood depths 2123 0.5% AEP central estimate

	Design Level (m AOD)	Flood Level (m AOD)	Flood Depth (m)
Ground level of the proposed front and rear gardens	7.23-7.28	7.09	Flood free
Access road through the site	6.20 - 7.20	7.09	From flood free to up to 0.89 where the access joins the existing highway
Finished floor level of proposed buildings	7.43	7.09	Flood free

In front of the residential properties, the access road level ranges from 7.20m - 6.80m AOD the access road are necessary to tie into the property levels and existing highway.

5.2.2 2123 0.1% AEP plus climate change event

During the 2123 0.1% (1 in 1000-year event), the site is predicted to flood to a maximum level of 7.39m AOD, as shown in Figure 5-3. Table 5-2 tabulates the component flood levels and depths across the site. The proposed dwellings on site will remain flood-free during the flood event, as the proposed FFLs are to be set at a level of 7.43m AOD.

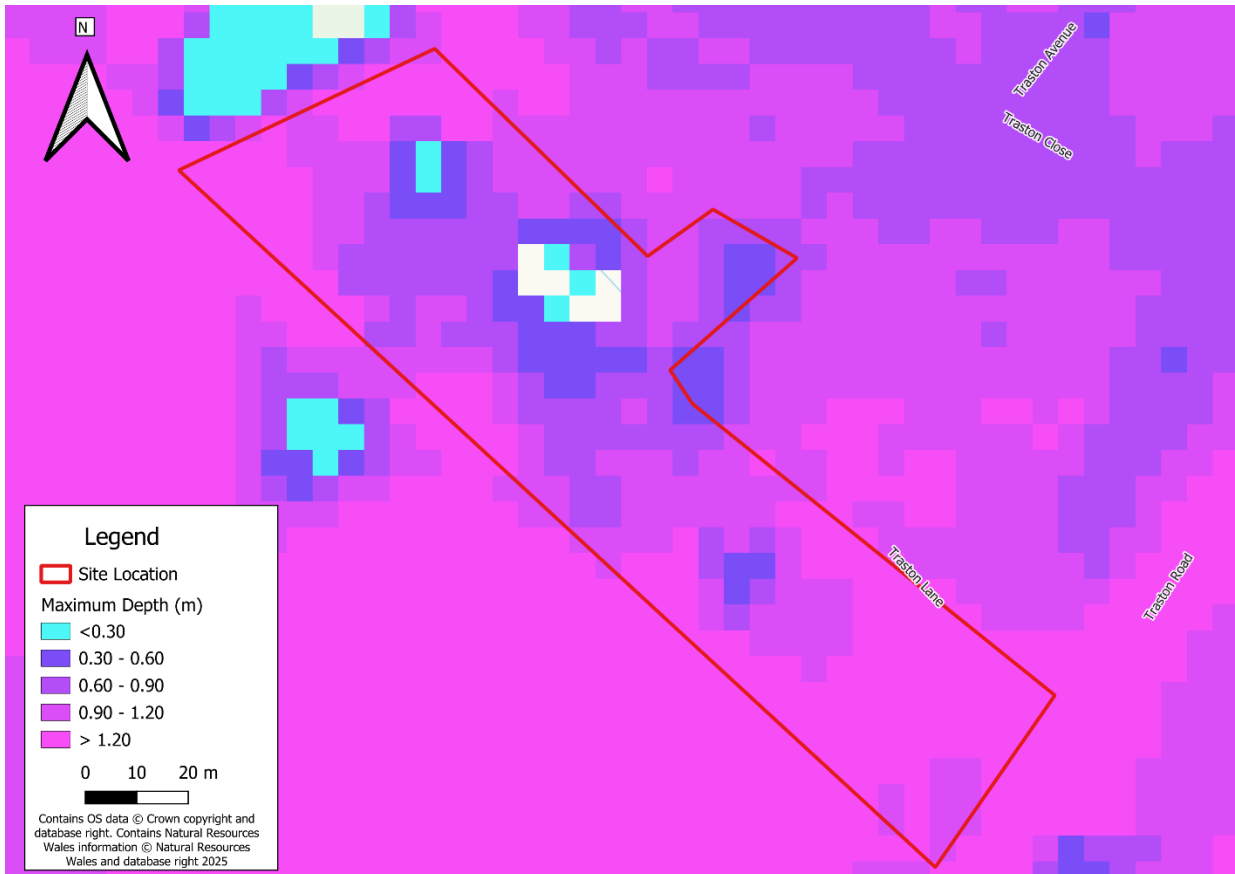


Figure 5-3 2123 0.1% AEP maximum flood depths

Table 5-2 post-development flood depths 2123 0.1% AEP

	Design Level (m AOD)	Flood Level (m AOD)	Flood Depth (m)
Ground level of proposed front and rear gardens	7.23-7.28	7.39	Up to 0.16
Access road through the site	6.20 - 7.20	7.39	Up to 1.19
Finished floor level of proposed buildings	7.43	7.39	Flood free

5.2.3 2123 0.5% AEP plus climate change event with higher end estimate

In line with the recently updated TAN-15 and to satisfy the requirements of Section 4.3 of TAN-15 the upper end estimate of climate change has been applied to the 2123 0.5% AEP (1 in 200-year event). Flood depth during this event are shown in Figure 5-4.

During the 0.5% AEP (1 in 200-year event), with the upper estimate for climate change applied, the maximum flood level on site is 7.41mAOD. This is 20mm above the 0.1% AEP 2123 flood level. However, the flood level remains below the finished floor level of the proposed dwellings. Table 5-3 tabulates the component flood levels and depths across the site in this design event.

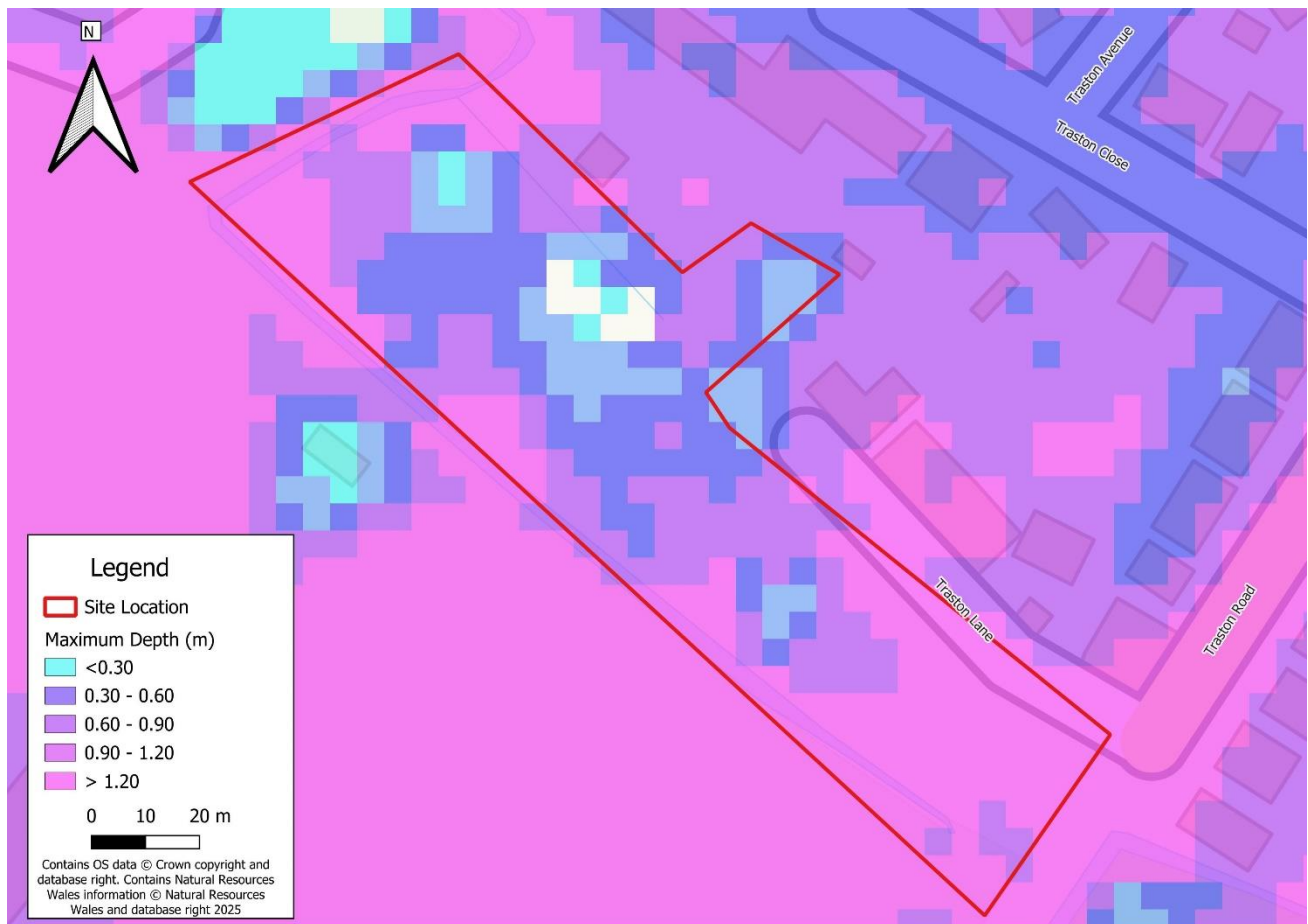


Figure 5-4 2123 0.5% AEP upper end estimate of climate change maximum flood depths

Table 5-3 Post-development flood depths 2123 0.5% AEP upper end estimate

	Design Level (m AOD)	Flood Level (m AOD)	Flood Depth (m)
Ground level of proposed front and rear gardens	7.23-7.28	7.41	Up to 0.18
Access road through the site	6.20 - 7.20	7.41	Up to 1.21
Finished floor level of proposed buildings	7.43	7.41	Flood free

5.3 Tidal defence breach modelling

As the site currently benefits from being in a TAN-15 defended zone, breach modelling has been undertaken in accordance with Section 10.26 of TAN15 to consider the residual risk of failure in the NRW flood defence.

5.3.1 Breach methodology

The JBA 2023 baseline model that had been used to run the 'As Existing' scenario was adapted to simulate the breach risk as follows.

- The two closest breaches that had previously been modelled for the NRW/JBA 2016 Caldicot and Wentlooge Coastal Modelling Project were chosen for the breach locations. These had previously been labelled as Breach 16 and Breach 32a, referencing that has been retain for consistency (see Figure 5-5).
- The setup of the breaches was carried over from the 2016 NRW study.
- Each breach was modelled separately during both 0.5% and 0.1% AEP in 2123 events (i.e. a total of four simulations was undertaken).
- Each model simulation was run for three tidal cycles with the peak (surcharged) level occurring during the central cycle.
- The breaches were modelled as follows.
 - Breach 16 was modelled as a 50-metre-wide opening (with a toe level of 6.1m AOD) in the estuary earth flood embankment. The breach was open for the duration of the model simulation, adopting a simplified precautionary approach.
 - Breach 32a was modelled as a 20-metre-wide opening (with a toe level of 6.0m AOD) in the defence wall at Goldcliff. The breach was open for the duration of the model simulation, adopting a simplified precautionary approach.

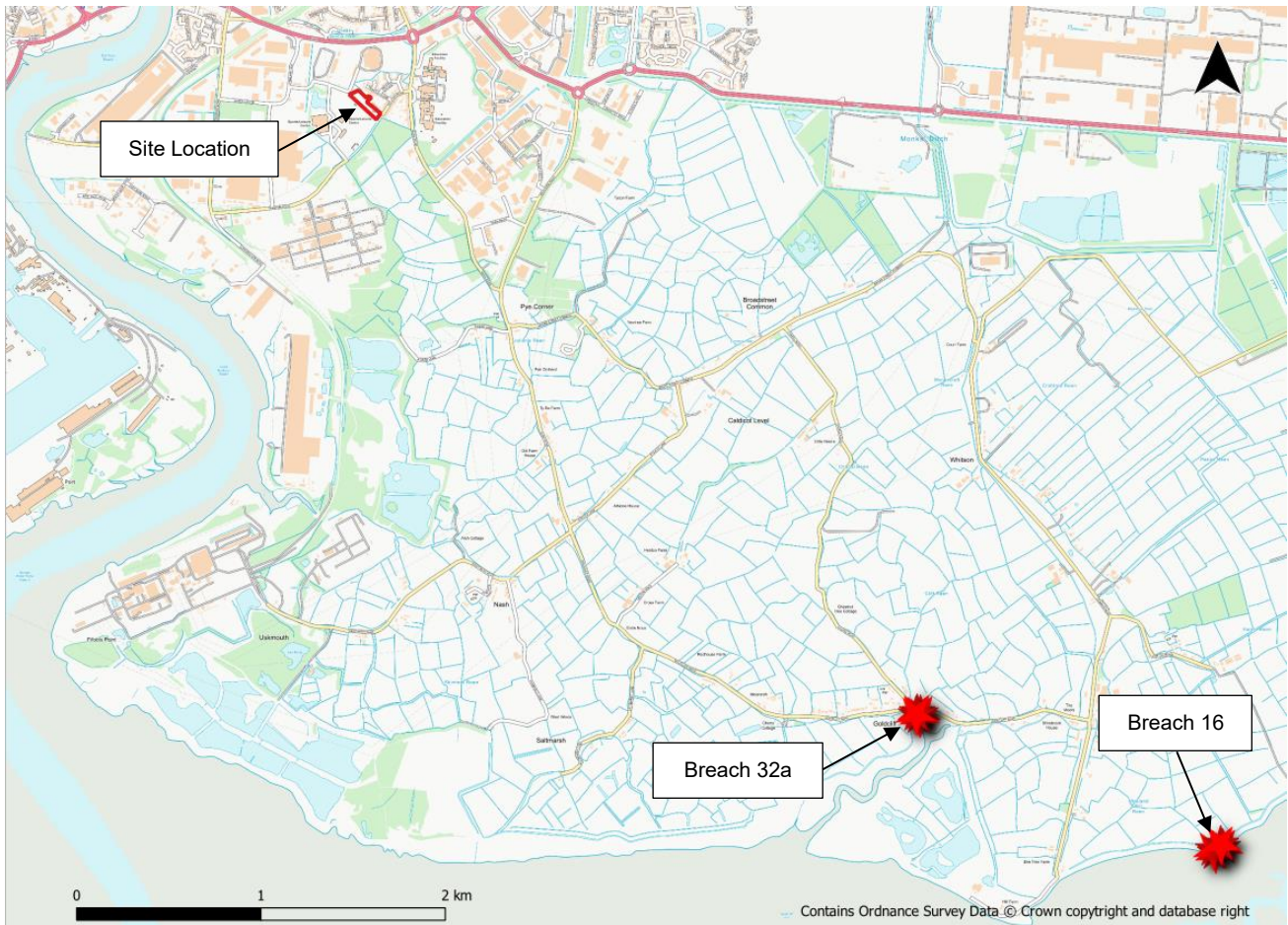


Figure 5-5 Modelled Breach Locations

5.3.2 Results

The 2123 epoch 0.5% AEP scenario plus climate change and 0.1% AEP scenario plus climate change has been considered to assess residual flood risk to the site from a breach of the tidal defences that protect Newport.

The maximum flood depth and levels on site during the breach scenario for the 0.5% AEP and 0.1% AEP flood events are presented in Table 5-4 and Table 5-5.

Table 5-4 Flood depths on site with and without breach scenario

Epoch	Breach Location	0.5% AEP without breach scenario (m)	0.5% AEP breach scenario (m)	0.1% AEP without breach scenario (m)	0.1% AEP breach scenario (m)
2123	16	1.65	1.65	1.95	1.95
2123	32a	1.65	1.65	1.95	1.94

Table 5-5 Flood levels on site with and without breach scenario

Epoch	Breach Location	0.5% AEP without breach scenario (mAOD)	0.5% AEP breach scenario (mAOD)	0.1% AEP without breach scenario (mAOD)	0.1% AEP breach scenario (mAOD)
2123	16	7.09	7.09	7.39	7.38
2123	32a	7.09	7.09	7.39	7.37

The breach scenarios show negligible change in flood levels compared to the baseline results. Therefore, the results have not been presented as maps, as these would appear identical to the maps already presented in Section 5.2.

The breach assessment shows that due to the massive overtopping of the coastal flood defences, a failure of the flood defence will have little or no impact on the flood risk at the site.

6 Flood Risk Resilience

TAN15 promotes the flood resilience of existing communities and the incorporation of flood resilience measures for development sites where there remains an element of flood risk. The development site is shown to be at risk of tidal flooding during the 0.1% AEP plus climate change event, and flood resilience is therefore integral to whether the consequences of flooding can be safely managed at a site.

Section 13.6 of TAN15 guides assessments to industry standard advice on incorporating resistance and resilience into development through design. This section has therefore been prepared in accordance with the CIWEM Code of Practice for Property Flood Resilience and the Ciria Code of Practice for Property Flood Resilience. The code of practice sets out recommendations for mitigation in categories defined as: realignment, resistance, resilience and response. Mitigation in relation to each category and how it can be applied to the proposed development is considered below.

6.1 Realignment

Opportunities to realign the flood receptor (i.e. the proposed development) and realign the flood pathways are set out in Table 6-1.

Table 6-1 Realignment Mitigation

Measure	Description	Feasibility
Realign flood receptor	Sequential approach in layout	The development proposes all dwellings to be raised so they are flood-free in all design events.
	Raise finished floor levels	Ground levels and finished floor levels shall be retained as close to typical existing levels as possible to avoid the potential for detriment to third parties as a result of the proposals.
	Locate vulnerable elements to first floor	More vulnerable aspects of the development, such as sleeping accommodation, are located on the upper floor of the properties.
	Restrict use of building	Highly vulnerable parts of the development are raised and designed to be flood-free in all design events.
Realign flood pathway	Redirect flow pathway	Given the extensive nature of flooding to the site and wider area in the extreme event, no opportunities arise to redirect flow paths to and around the site. To do so may result in detriment to third parties.

Measure	Description	Feasibility
	Change ground levels	Not feasible without increasing the risk of flooding elsewhere. For this reason, ground levels across the site are typically maintained as per the baseline scenario and to tie in with surrounding road levels to the site.
	Sustainable Drainage Systems (SuDS)	Given the extensive nature of flooding to the site and wider area in the extreme event, SuDS are unlikely to be sufficient to manage flood flows/volumes.

6.2 Resistance and Resilience

Further to the consideration of realignment measures, it is normally recommended that developments should adopt flood resistance measures, where applicable, in accordance with the CIRIA Property Flood Resilience Code of Practice. However, in this instance, the residential dwellings are predicted to be flood-free in all design events, with the FFLs raised above the extreme tidal flood level. Consequently, the application of PFR measures is not recommended for this development.

6.3 Response

Preparation for how to respond in the event of a flood is a critical mitigation measure.

Residents should be encouraged to sign up for NRW’s flood warnings to facilitate timely preparations and evacuation of the site before a flood event. The site is covered by the 'Usk Estuary' flood alert area and 'Usk Estuary at South Liswerry' flood warning area.

NRW flood warnings for tidal surge events are typically provided 24-48 hours in advance of a flood event. Flood warnings give notice that “flooding is expected” and “immediate action is required”. Such significant lead times provide ample time for residents to prepare and respond to a flood warning – particularly given that any flooding would not directly impact the residential dwellings. On the receipt of a flood warning, residents would be advised to evacuate the site or very closely monitor the situation around high tide; following the advice of the emergency services.

In the event that insufficient warning is provided, residents should enact a 'stay put' strategy, remaining in their properties until the flood event has passed.

The effectiveness, accuracy and lead-in time for flood warnings can reasonably be expected to improve over time and may be significantly improved when the site’s flood risk becomes more significant (50+ years time).

It is recommended that a Flood Response Plan (FRP) is prepared to inform the occupants of the risk of flooding and detail actions before, during and after a flood event. At a minimum, the Flood Response Plan should cover adequate flood warning, evacuation and access/egress routes in the event of flooding for the lifetime of the development. NRW

provide guidance¹⁰ for the production of flood emergency plans. This guidance should be used to inform flood response procedures at the site.

6.4 Flood Defences

The modelling included as part of this FCA identifies that parts of the proposed development site and access from the proposed site will flood in the 0.5% AEP and 0.1% tidal events as a result of climate change, along with large areas of Newport when existing defences are overtopped.

The lifetime of the development is 100 years, and therefore this future flood risk will need to be appropriately managed as sea levels rise. As discussed in Section 3.6, the proposed development site is located on the border of Policy Units NEW5 of the Severn Estuary Shoreline Management Plan, which is subject to a 'Hold the Line' policy. Policy Unit NEW5 covers a large section of Newport, on the eastern bank of the River Usk from the Spytty Pill to the Uskmouth Power Station adjacent the River Severn and therefore contain a high number of properties and businesses. As such, there is an overwhelming business case for addressing future tidal flood risk in Newport on a strategic scale. The proposed development site is located in an area benefitting from existing defences and will therefore benefit from the future actions stated in the Severn Estuary SMP.

It is likely that future flood risks to the development site will be at least partially mitigated by future flood defence improvements, aimed at protecting existing properties in the area. This shall also support a sustainable future for Newport, allowing sites such as the proposed development site to proceed in compliance with TAN-15. We therefore believe that a pragmatic approach should be taken when considering this planning application in terms of its future flood risk.

¹⁰ <https://naturalresources.wales/flooding/preparing-for-a-flood/?lang=en>

7 Flooding and the Plan Led System

7.1 Application of Flood Zones to Development Management Decisions

When considering a site for development, TAN-15 sets out the requirements for the form of development in any given flood zone.

It is understood that the presence of the site within the TAN-15 Defended Zone supplants the sites' location within Flood Zones 3, regardless of the source of risk.

TAN15 10.17 [*In Defended Zones*] Applications for new development on Greenfield sites are not appropriate in Defended Zones unless they are allocated in development plans. On brownfield sites redevelopment proposals should not over intensify use neither should they reduce the area's ability to absorb flood water nor cause problems with flooding elsewhere. All applications should consider opportunities to incorporate flood resilient design as appropriate and any proposal involving highly vulnerable development must be compliant with the tolerable conditions set out in section 11. The development proposals are for 26 residential dwellings, new access works and a new pumping station.

As a greenfield site located in a Defended Zone and benefiting from an appropriate allocation in the current LDP, the principle of development is established.

Provided that the principle of development is justified, development must demonstrate compliance with the acceptability considerations set out within Section 11 of TAN-15. This is demonstrated in section 7.2.

7.2 Acceptability of Flood Consequences

Whether a development should proceed or not will depend upon whether the consequences of flooding can be safely managed, including its effects on flood risk elsewhere. TAN-15 sets out the key conditions that should be met to demonstrate that development is appropriate for its location.

The site has been assessed against the Acceptability Criteria of Section 11 of TAN-15, as shown in Table 7-1.

Table 7-1 Assessment of Acceptability Criteria

TAN-15 Acceptability Criteria	Comments	Achieved
No increase in flooding elsewhere.	Given the small scale of the development, the small total footprint of proposed buildings, and the tidal nature of the flooding event, the displaced volume of flooding and the impact of displaced water are expected to be negligible. Consequently, the proposed development has not been directly modelled, and the effectiveness of the proposed flood mitigation measures will be assessed from the baseline results.	Yes
Occupiers aware of flood risk	The site owners will be provided with information on the risk to the site in the form of this report.	Yes
Escape/evacuation routes present	As the risk to the site is from tidal flooding, there would be flood warnings with significant (24-48hr) lead times, which would allow residents to prepare, monitor and evacuate the site as necessary. If evacuation is not possible for whatever reason, the properties are predicted to remain flood-free for the lifetime of the development.	Yes
Flood emergency plans and procedures agreed and in place	It is recommended that a Flood Response Plan be developed and provided to residents.	Yes
Flood resistant and resilient design	All properties are to have raised floor levels which means that they are shown to be flood-free up to the 2123 epoch 0.1% AEP flood event.	Yes
Acceptable consequences for type of use	Detailed in section 7.2.	Yes

7.2.1 Frequency thresholds: designing development to be flood-free

The required design standard for new development is to be flood-free during the 0.5% AEP tidal event, plus an allowance for climate change over the lifetime of development, as stated in section 11.7 of TAN-15.

The proposed dwellings are proposed to be flood-free during the 0.5% AEP flood event with the central estimate and upper end estimate for climate change applied.

As demonstrated in section 5 of this report, the proposal meets this frequency threshold.

7.2.2 Tolerable conditions: managing consequences in an extreme flood event

The flood-free thresholds relate to very serious but not extreme flood events. During extreme flood events, there is recognition that it may not be possible to keep development flood-free. Figure 6 of TAN-15 provides indicative tolerable flood depth and velocity conditions for the 0.1% AEP event, including an allowance for climate change. Up to 600mm of flooding is considered tolerable within More Vulnerable Developments.

All proposed dwellings will be flood-free during the 0.1% AEP event, plus an allowance for climate change over the lifetime of the development, with the majority of the site predicted to flood within the tolerable 600mm flood depth. Some areas of the site, including the highway connection, are predicted to flood to greater depths, which is unavoidably required to provide level access to the highway and surrounding infrastructure.

It is therefore concluded that the proposals meet the tolerable conditions as outlined in Figure 6 of TAN-15.

8 Conclusions

JBA Consulting were commissioned by Bron Afon Community Housing to undertake a FCA to support a planning application for 26 residential dwellings, new access works and a new pumping station on land adjacent to Traston Lane, Newport.

The development proposals are classified as Highly Vulnerable Development under TAN-15.

The site is located in TAN 15 Defended Zone for the Sea which is protected against flooding from the sea up to the 1 in 200 year event.

The site is low risk of flooding from surface water and sewers and at very low risk of flooding from rivers, groundwater and reservoirs.

In order to manage the risk of flooding, the ground floor of the proposed residential buildings shall be raised to 7.43mAOD. The front and rear garden levels will vary between 7.23-7.28m AOD and the access road level through the site will range in levels between 6.20-7.20mAOD to tie in with Traston Road.

NRW's Caldicot and Wentlooge Coastal Model has been updated to support the assessment. This modelling has provided detailed information on flood levels and depths for the full range of TAN15 design events, including assessment of the residual risk of flood defence failure. The proposed flood mitigation measures have been informed by this modelling.

Following the raising of site levels and development of the site, it is predicted that the proposed dwellings will be flood-free in all design events, including the 2123 0.1% AEP event with flood defence breach.

Considering the risk of tidal flooding across the site, it is recommended that a Flood Plan is prepared for future occupants of the buildings. At a minimum, the flood response plan should cover adequate flood warning, evacuation and access/egress routes in the event of flooding for the lifetime of the development. The properties will be owned and managed by Bron Afon Community Housing, who as a housing association, are well placed to prepare, maintain, communicate and support implementation of a flood response plan.

The proposed development shall not increase flood risk elsewhere, due to the extensive and massive volume of tidal flooding across Newport.

In conclusion, the FCA has found that in respect to flood risk, the development meets the requirements set out in TAN-15 and the aims of Planning Policy Wales.

A Topographic Survey

B Development Proposal



Legend

- Proposed Rising Main
- Proposed Surface Water Sewer (SAB)
- Proposed Welsh Water Foul Sewer (Section 104)
- Existing Welsh Water Combined Sewer
- Raingarden overflow
- ▭ SuDS Bioretention (serves highway and is adoptable by the SAB)
- ▭ SuDS Attenuation Basin
- ▭ SuDS Permeable Paving (private only serving a single plot)
- ▭ SuDS Permeable Paving (adoptable)
- ▭ SuDS Private Raingarden (private only serving a single plot)
- < Precast headwall
- ▭ Proposed Cellular Attenuation
- ▭ Finished Floor Level (FFL) minimum 7.430m
- ▭ Retaining Wall
- ▭ SuDS planter

- GENERAL NOTES**
- Do Not Scale
 - The contractor is to check and verify all buildings and site dimensions and levels, including sewer invert levels, before works start on site. The contractor is to comply in all aspects with the current building legislation, British Standards, building regulations etc.
 - Positions of existing services/statutory undertakers apparatus adjacent to or crossing proposed excavations are to be checked by the contractor prior to starting work
 - This drawing is to be read in conjunction with and checked against all other drawings, Engineering Details, Specification and any structural, geotechnical or other specialist document provided.
 - Any anomaly or contradiction between any of the above is to be reported to the Client.
 - This drawing is schematic for clarity only, positions of pipe runs and manholes may vary on site due to site conditions.

- ROAD AND SEWER ADOPTION NOTES**
- All works for adoption under a Section 38 agreement shall be carried out to the approval of the Newport Council.
 - All works for adoption under a section 104 agreement shall be carried out to the national water council guide "sewers for adoption" 7th edition (SIAT) and the requirements of Dwr Cymru Welsh Water as the statutory sewerage undertaker and the Welsh ministers build standard.
 - A Section 106 application to connect must be made to DCWW, the developer shall give 21 days notice prior to connection, the works may only be undertaken by a DCWW health & safety approved contractor.
 - An accredited contractor by the British Plastics Federation will be used to lay any adoptable plastics pipes, a copy of the accreditation certificate to be supplied to DCWW before any order is placed or work commences on site.
 - Streetlighting positions to be pegged on site and agreed by the Local Authority PRIOR to erection commencing.

LEVELS SHOWN ON THIS DRAWING ARE FOR PLANNING PURPOSES, DETAILED DESIGN LEVELS MAY DIFFER

REV.	DATE	DETAILS	AMENDMENTS	BY	CHK.
P04	18.05.25	External spot levels added.		SJD	TOR
P03	08.04.25	Road levels amended		TOR	SJD
P02	07.04.25	FFLs raised above the 1 in 200 yr - CC flood event		TOR	SJD
7	05.12.24	First Issue		TOR	SJD

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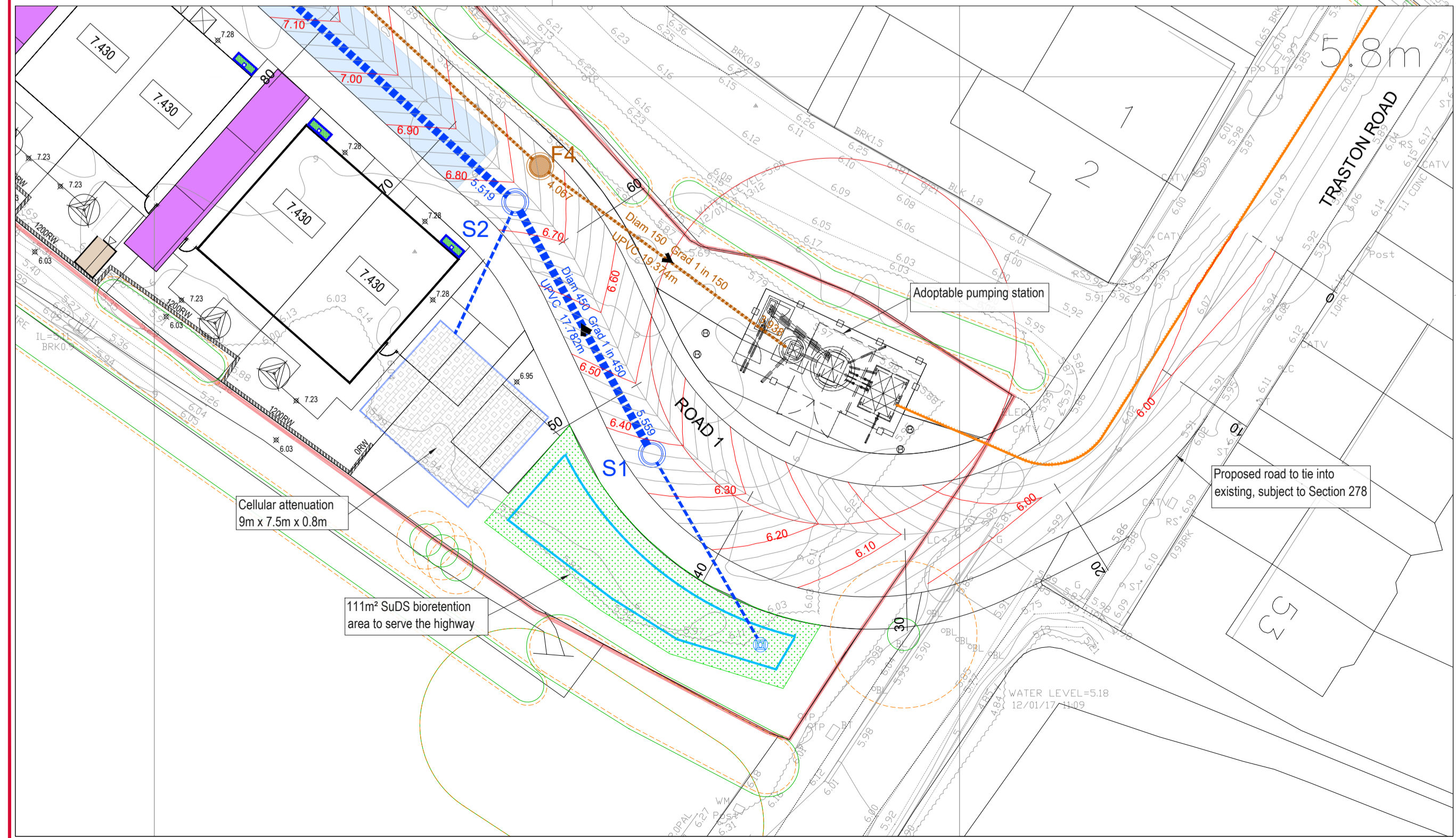
PROJECT: **Traston Road, Newport**

DRAWING TITLE: **Engineering Layout**

DRG NO: PROJECT ORIGIN VOLUME LEVEL TYPE ROLE NUMBER

2595-PHG-XX-XX-DR-C-0001

DRAWN:	CHK:	PHG JOB NO:	SCALE(S) AT A1:
TOR	SJD	2595	1:200
DATE:	SUBMITTER:	REV:	STATUS:
05.12.24	Planning	P04	S1

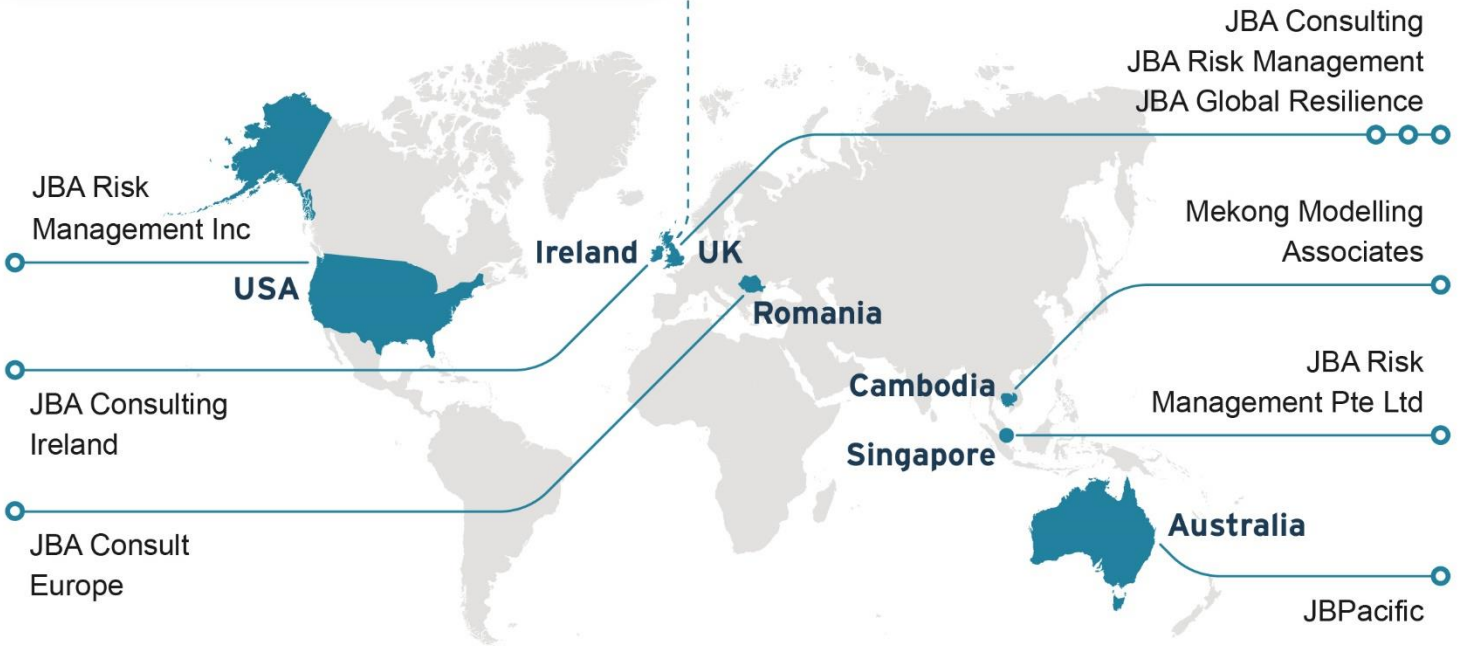


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