

LORETO CONVENT, ABBEY ROAD, LLANDUDNO,
CONWY, LL30 2EL

FLOOD CONSEQUENCES ASSESSMENT

Final Report v1.0
February 2025

Report Title **Loreto Convent, Abbey Road, Llandudno, Conwy, LL30 2EL**
Flood Consequences Assessment
Final Report v1.0

Client Enfys Development Limited

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List of Abbreviations

AEP	Annual Exceedance Probability	LFRMS	Local Flood Risk Management Strategy
AOD	Above Ordnance Datum	LiDAR	Light Detection and Ranging
ASGWF	Areas Susceptible to Groundwater Flooding	LLFA	Lead Local Flood Authority
bgl	Below Ground Level	LPA	Local Planning Authority
BGS	British Geological Survey	l/s	Litres per Second
BRE	Building Research Establishment	m	Metres
BSI	British Standards Institute	m ²	Square Metres
CC	Climate Change	m ³	Cubic Metres
CCMA	Coastal Change Management Area	NFM	Natural Flood Management
CFMP	Catchment Flood Management Plan	NGR	National Grid Reference
CIRIA	Construction Industry Research and Information Association	NRW	Natural Resources Wales
CRT	Canal and River Trust	NVZ	Nitrate Vulnerable Zone
DCWW	Dŵr Cymru Welsh Water	OS	Ordnance Survey
DEFRA	Department for Environment, Food and Rural Affairs	PFRA	Preliminary Flood Risk Assessment
DS	Drainage Statement	PPW	Planning Policy Wales
EA	Environment Agency	QBAR	Mean annual maximum runoff rate
FCA	Flood Consequences Assessment	QMED	Median annual maximum runoff rate
FCADS	Flood Consequences Assessment and Drainage Statement	RBD	River Basin District
FCERM	Flood and Coastal Erosion Risk Management	RBMP	River Basin Management Plan
FFL	Finished Floor Level	RFI	Request for Information (to NRW)
FMP	Flood Management Plan	RMA	Risk Management Authority
FRMP	Flood Risk Management Plan	RoFSW	Risk of Flooding from Surface Water
FWA	Flood Warning Area	SAC	Special Area of Conservation
FWEP	Flood Warning and Evacuation Plan	SFCA	Strategic Flood Consequences Assessment
FWMA	Flood and Water Management Act	SMP	Shoreline Management Plan
FWS	Flood Warning System	SoP	Standard of Protection
GSPZ	Groundwater Source Protection Zone	SSSI	Site of Special Scientific Interest
ha	Hectare	SAB	SuDS Approving Body
IDD	Internal Drainage Districts	SuDS	Sustainable Drainage System
km	Kilometres	SWMP	Surface Water Management Plan
		TAN15	Technical Advice Note 15
		WFD	Water Framework Directive

1 INTRODUCTION

1.1 Purpose of Report

Weetwood Services Ltd ('Weetwood') has been instructed by Enfys Development Limited to prepare a FCA report to accompany a full planning application for the proposed redevelopment of the western part of Loreto Convent, Abbey Road, Llandudno ("the site") for residential use.

The assessment has been undertaken in accordance with the requirements of TAN15 dated July 2004 and taking into account the revised (draft) version of TAN15 (January 2023).

1.2 Structure of the Report

The report is structured as follows:

- Section 1** Introduction and report structure
- Section 2** Provides background information relating to the development site
- Section 3** Presents national and local flood risk planning policy
- Section 4** Assesses the potential risk of flooding to the development site
- Section 5** Presents a summary of key findings and the recommendations

1.3 Relevant Documents and Planning Policy

The assessment has been informed by the following documents, policy and information:

- Technical Advice Note 15: Development, Flooding and Coastal Erosion, Welsh Government, January 2023 (Consultation Version)
- Stage 1 Strategic Flood Consequences Assessment, Conwy County Borough Council, November 2022;
- Flood Consequences Assessments: Climate Change Allowances, Welsh Government, September 2021, https://gov.wales/sites/default/files/publications/2021-09/climate-change-allowances-and-flood-consequence-assessments_0.pdf
- Replacement Local Development Plan 2018-2023: Preferred Strategy, Conwy County Council, July 2019;
- Conwy Local Development Plan 2007-2022, Conwy County Borough Council, October 2013;
- Conwy Local Flood Risk Management Strategy, Conwy County Borough Council, February 2013;
- West of Wales Shoreline Management Plan 2, June 2012;
- Preliminary Flood Risk Assessment, Conwy County Borough Council, June 2011;
- Technical Advice Note 15: Development and Flood Risk, Welsh Government, July 2004;
- Soilscales, Soil and AgriFood Institute, Cranfield University, www.landis.org.uk/soilscales/;
- National Geoscience Data Centre's Single Onshore Borehole Index, <https://www.bgs.ac.uk/products/onshore/SOBI.html>;
- BGS Mapping of Surface Geology, <https://www.bgs.ac.uk/map-viewers/geoindex-onshore/>.

1.4 Third Party Surveys, Drawings and Assessments

The assessment has been informed by the following third party surveys, drawings and assessments:

- Proposed Site Plan, Matthew Jones Architects, D-1420-07/23 PL00, Rev.C, October 2024 (**Appendix A**);
- Topographical Survey, Malcolm Hughes Land Surveyors, Drawing no. 17080/1 Rev. A - Survey undertaken in May 2015 (**Appendix B**).

1.5 Explanatory Note on Flood Probability

This report refers to the likelihood of a flood event occurring in terms of an AEP expressed as a percentage. This terminology is consistent with the definition of the development advice zones presented in Figure 1 of TAN15 (2004) and the flood zones on the Flood Map for Planning (refer to **Section 4.2** of this report).

The AEP is the reciprocal of the return period which describes the rarity of an event in terms of its statistical reoccurrence interval in years. For example, a '1 in 30 year flood' has a $1/30 = 0.033$ (3.3%) probability of

occurring or being exceeded in any one year, whilst a '1 in 100 year flood' has a $1/100 = 0.010$ (1.0%) probability of occurring or being exceeded in any one year.

AEP	AEP (expressed as a %)	Return Period (years)	Alternative Expression
0.033	3.3%	30	1 in 30
0.010	1.0%	100	1 in 100
0.005	0.5%	200	1 in 200
0.001	0.1%	1,000	1 in 1,000

2 SITE DETAILS AND PROPOSED DEVELOPMENT

2.1 Site Location

The approximately 0.6 ha site is located north of Abbey Road at OS NGR SH 772 822 as shown in **Figure 1**.

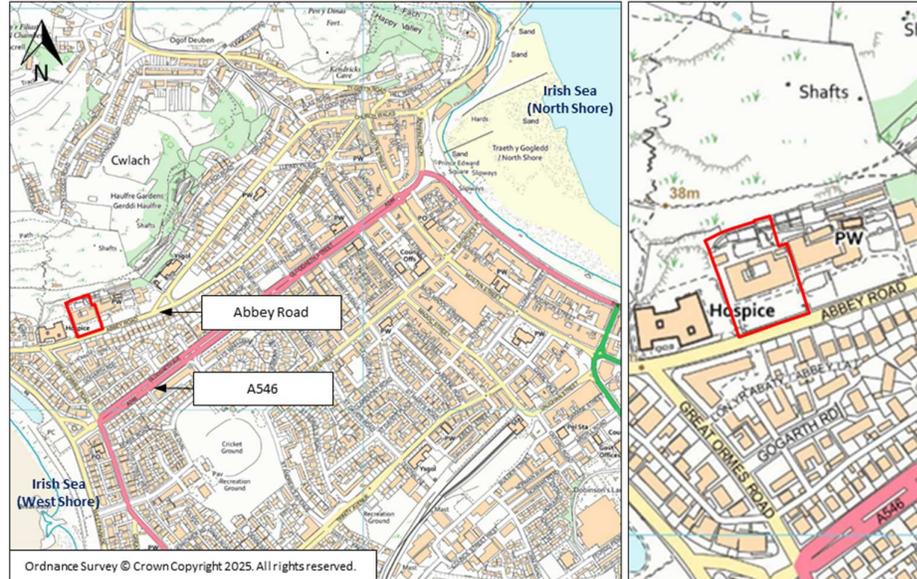


Figure 1: Site Location and Location of Surface Waterbodies

2.2 Existing and Proposed Development

The existing site is currently occupied by the western part of the Loreto Convent Centre with car parking to the front (south) of the building. An existing rendered wall is present along the southern boundary of the site, adjacent to Abbey Road, with existing access points to the west and east.

The proposals are for the demolition of the existing building to allow the construction of a new building comprising thirty apartments over three-floors with associated facilities, three no. bungalows, car parking and landscaping. Access to the site will continue to be provided via Abbey Road to the south-east.

The proposals include the removal of the existing wall along the southern boundary of the site and the re-instatement of a new stone faced retaining wall. The existing opening to the west will be removed as part of the new retaining wall construction, with the wall also extending along the western site boundary.

The proposed site plan is provided in **Appendix A**.

TAN15 classifies residential development as Highly Vulnerable to flood risk.

2.3 Surface Waterbodies in the Vicinity of the Site

The Irish Sea is located approximately 250 m south-west (West Shore) and 950 m north-east (North Shore) of the site.

2.4 Topographic Levels

A topographic survey of the site has been undertaken by Malcolm Hughes Land Surveyors (**Appendix B**) and LiDAR data has been used to develop a digital terrain model of the site and surrounding area as illustrated in **Figure 2**.

The topographic survey indicates that ground levels within the vicinity of the existing Loreto Convent Centre building are in the region of 9.4 - 14.0 m AOD, falling to 7.1 - 7.6 m AOD within the area of the existing car park to the south. The existing rendered wall along the southern boundary of the site is indicated to be at a

height of 7.4 - 7.8 m AOD. Two low spots are indicated to the west and east of the wall, representing the existing access points into the site. Ground levels within these areas are indicated to be in the region of 5.7 - 6.9 and 6.0 - 7.1 m AOD respectively, rising quickly to the north.

Ground levels on Abbey Road are indicated to be in the region of 5.3 - 5.7 m AOD adjacent to the site, rising to 6.2 m AOD to the east.

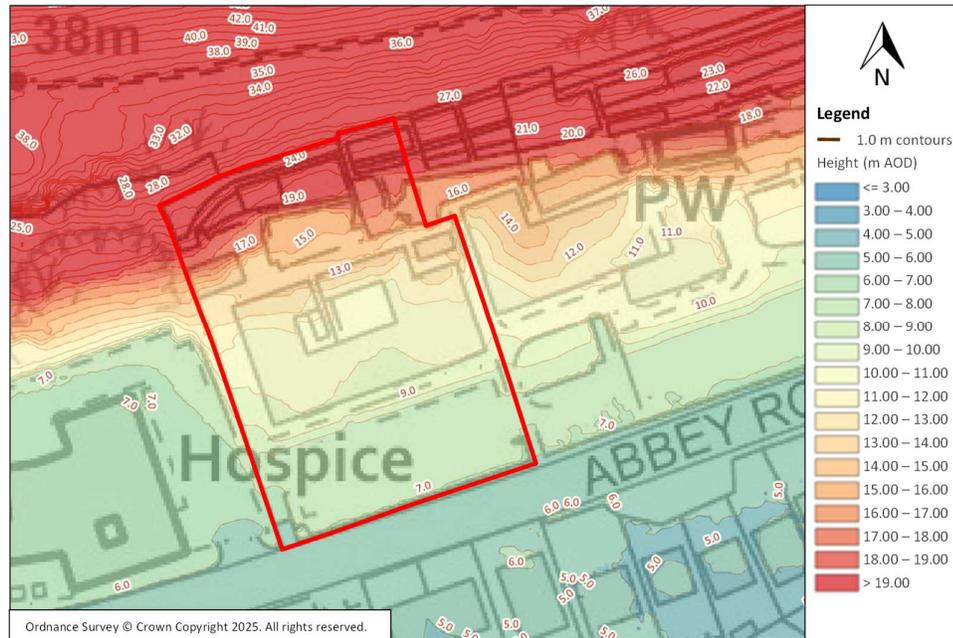


Figure 2: Digital Terrain Model from LiDAR Data

2.5 Ground Conditions

According to the Soilsapes soils dataset produced by the Cranfield Soil and AgriFood Institute¹, soil conditions at the site and within the surrounding area are described as sand dune soils.

BGS mapping of surface geology² indicates the underlying bedrock formation comprises Llanarmon Limestone Formation - Dolostone, overlain by Till, Devensian - Diamicton superficial deposits.

According to the BGS and NRW aquifer designation dataset³ the superficial deposits at the site are classified as a Secondary A aquifer whilst the underlying bedrock is classified as a Principal aquifer. The site is not shown to be located within a designated GSPZ⁴.

¹ www.landis.org.uk/soilsapes/

² <https://www.bgs.ac.uk/map-viewers/geoindex-onshore/>

³ <https://www.bgs.ac.uk/map-viewers/geoindex-onshore/>

⁴ https://datamap.gov.wales/layers/inspire-nrw:NRW_Source_Protection_Zones

3 PLANNING POLICY AND GUIDANCE

3.1 National Planning Policy and Policy Guidance

Future Wales - the National Plan 2040 sets out the national development framework for Wales with a strategy for addressing key national priorities through the planning system, including sustaining and developing a vibrant economy, achieving decarbonisation and climate-resilience, developing strong ecosystems and improving the health and well-being of our communities.

Policy 8 - Flooding states that *“flood risk management that enables and supports sustainable strategic growth and regeneration in National and Regional Growth Areas will be supported. The Welsh Government will work with Flood Risk Management Authorities and developers to plan and invest in new and improved infrastructure, promoting nature-based solutions as a priority. Opportunities for multiple social, economic and environmental benefits must be maximised when investing in flood risk management infrastructure. It must be ensured that projects do not have adverse impacts on international and national statutory designated sites for nature conservation and the features for which they have been designated”*.

PPW sets out government's planning policies for Wales and how these are expected to be applied. TAN15 (2004) provides technical guidance which supplements the policy within PPW and seeks to ensure that flood risk is taken into account at all stages in the planning process and is appropriately addressed.

The general approach of TAN15 (2004) is to set out a precautionary framework to guide planning decisions in areas at high risk of flooding. The overarching aim of the framework is, in order of preference, to:

- Direct new development away from those areas which are at a high risk of flooding.
- Where development has to be considered in high risk areas (i.e. zone C) only those developments which can be justified should be located in such areas.

In accordance with paragraph 6 of TAN15 (2004), development will only be justified if it can be demonstrated that:

- i. Its location in zone C is necessary to assist, or be part of, a local authority regeneration initiative or a local authority strategy required to sustain an existing settlement; **or**,
- ii. Its location in zone C is necessary to contribute to key employment objectives supported by the local authority, and other key partners, to sustain an existing settlement or region;

and,

- iii. It concurs with the aims of PPW and meets the definition of previously developed land (PPW Figure 2.1); and,
- iv. The potential consequences of a flooding event for the particular type of development have been considered, and in terms of the criteria contained in sections 5 and 7 and appendix 1 found to be acceptable.

A revised version of TAN15 and updated Flood Map for Planning are due to be published in the near future (albeit the timing is yet to be confirmed by Welsh Government). The Flood Map for Planning currently holds no formal weight as it is not yet national policy, but Welsh Government advise that this best available information may be regarded as a material consideration.

National policy requires that planning applications for new development proposals should incorporate SuDS to appropriate operational standards and with maintenance arrangements in place unless there is clear evidence that this would be inappropriate.

Statutory standards for sustainable drainage were published by Welsh Government in October 2018 in relation to the design, construction, operation and maintenance of sustainable drainage systems serving new developments of more than one house or where the construction area is equal to or greater than 100 m². These standards set out how surface water runoff generated during the 100%, 3.3% and 1% AEP rainfall events and for events exceeding the 1% AEP event should be managed, how peak runoff rates should be restricted and how runoff volumes should be controlled. Approval is subsequently required from the SAB before construction can commence.

3.2 Local Planning Policy

The Conwy Local Development Plan 2007-2022 was adopted by Conwy County Borough Council in October 2013. Strategic Policy DP/1 Sustainable Development Principles states that *“All developments are required to...f) Take account of and address the risk of flooding...”*. Strategic Policy DP/4 Development Criteria states that *“Planning permission will not be granted where the proposed development would have an unacceptable adverse impact...g) On flooding and flood risk”*.

Conwy County Borough Council is currently preparing a Replacement Local Development Plan 2018-2033. The Preferred Strategy was published in July 2019 and consulted on between July-September 2019. Strategic Objective 13 is to *“Support growth, regeneration and development opportunities in Coastal Areas, whilst at the same time being aware and responsive to the challenges resulting from natural pressures”*.

Strategic Policy 26 Flooding states:

“To be globally responsive by ensuring long-term protection and adaption to flood risk as well as de-risking in line with national guidance, whilst achieving wider landscape, habitat, air quality, biodiversity and sustainable travel goals. New development should reduce, and must not increase, flood risk arising from river and/or coastal flooding on and off the development site itself.

The priority should be to protect the undeveloped or unobstructed floodplain from development and to prevent the cumulative effects of incremental development”.

3.3 Water Framework Directive

The WFD provides a legal framework for the protection, improvement and sustainable use of inland surface waters, groundwater, transitional waters, and coastal waters across England, and seeks to:

- Prevent deterioration in the status of surface water and groundwater bodies;
- Protect, enhance and restore surface water and groundwater bodies (except artificial or heavily modified water bodies) with the aim of achieving good ecological, chemical and groundwater quantitative status by December 2021;
- Protect and enhance artificial and heavily modified water bodies with the aim of achieving good ecological potential and good chemical status by December 2021;
- Progressively reduce or phase out the release of individual pollutants or groups of pollutants that present a significant threat to the aquatic environment and progressively reduce pollution of groundwater.

The WFD applies to any proposed development which has the potential to impact on a waterbody. Where this is the case, the EA may require evidence demonstrating that the proposed development does not compromise the aims of the WFD.

4 REVIEW OF FLOOD RISK

4.1 Historical Records of Flooding

The Flood Map for Planning - Recorded Flood Extents and associated database⁵ indicates that there are no records of flooding at or within the immediate vicinity of the site.

4.2 Flood Risk from the Sea (Tidal / Coastal)

Figure 1 of TAN15 (2004) defines three development advice zones as follows:

- Zone A: Considered to be at little or no risk of fluvial or tidal/coastal flooding
- Zone B: Areas known to have been flooded in the past evidenced by sedimentary deposits
- Zone C: Based on the NRW flood outline, equal to or greater than 0.1% (river, tidal or coastal). Zone C is subdivided into the following two zones:
 - Zone C1: Areas of the floodplain which are developed and served by significant infrastructure, including flood defences
 - Zone C2: Areas of the floodplain without significant flood defence infrastructure

The development advice zones are shown on the Development Advice Map⁶ and are defined by the predicted extent of the 0.1% (sea and rivers) AEP event (zone C) and BGS drift data (zone B). The zones do not take account of the possible impacts of climate change and consequent changes in the future probability of flooding.

The Development Advice Map (**Figure 3**) indicates that most of the site is located in zone A; however, the south-western corner is shown to partially fall within zone C1.

The Flood Map for Planning - Rivers and Sea (**Figure 4**) indicates that the site is not at risk from flooding from rivers or the sea except for the southern boundary, which is shown to be in flood zone 3 (sea) and in a TAN15 defended zone.

The flood zones are defined as follows and include the effects of climate change:

- Flood zone 1 (Rivers and Sea): Less than a 0.1% chance of flooding from rivers and the sea in a given year
- Flood Zone 2 (Rivers): Areas with a 0.1% to 1.0% chance of flooding from rivers in a given year
- Flood Zone 3 (Rivers): Areas with more than a 1.0% chance of flooding from rivers in a given year
- Flood Zone 2 (Sea): Areas with a 0.1% to 0.5% chance of flooding from the sea in a given year
- Flood Zone 3 (Sea): Areas with more than a 0.5% chance of flooding from the sea in a given year
- TAN15 Defended Zones: Areas that benefit from RMA flood defences with a present day 1.0% AEP and 0.5% AEP SoP for rivers and the sea respectively.

⁵ https://datamap.gov.wales/layers/inspire-nrw:NRW_HISTORIC_FLOODMAP

⁶ <https://naturalresources.wales/evidence-and-data/maps/long-term-flood-risk/?lang=en>

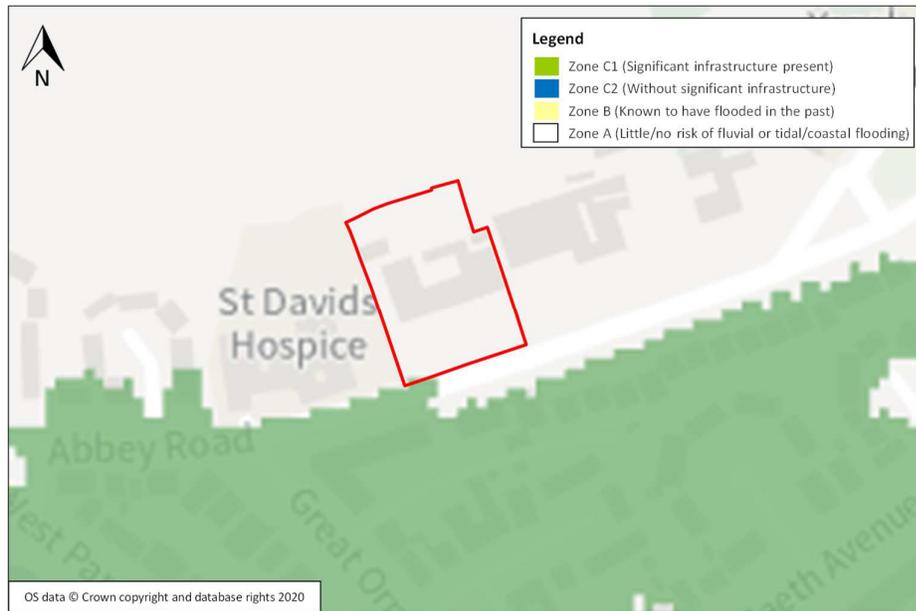


Figure 3: Development Advice Map
Source: NRW website; Accessed: February 2025

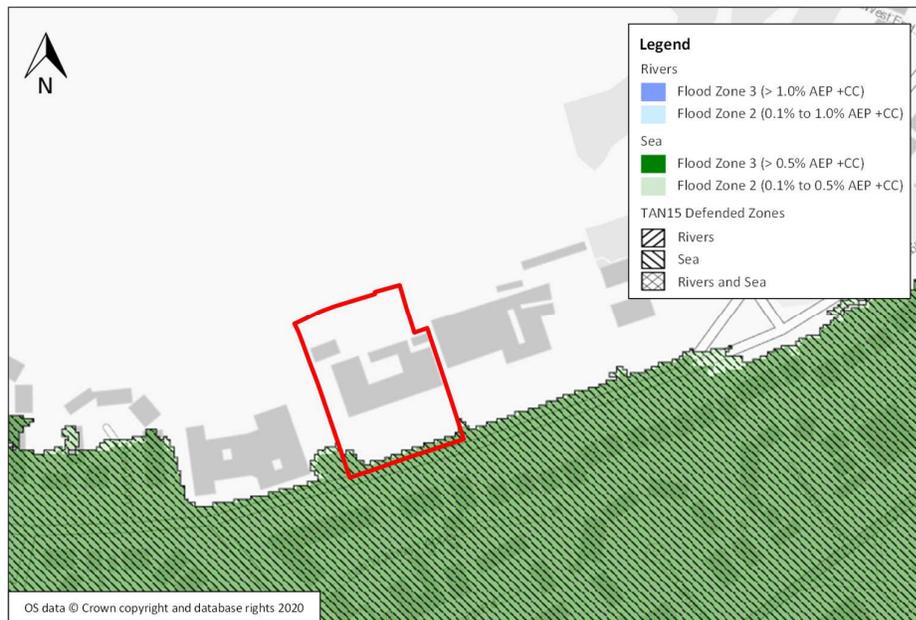


Figure 4: Flood Map for Planning - Rivers and Sea
Source: NRW website; Accessed: February 2025

Tidal flood defences are present along the North and West Shore of Llandudno (refer to **Figure 5**). As indicated on the DataMapWales⁷ these comprise the North Shore Promenade on the North Shore, which comprises a stepped sea wall, promenade and dwarf wall. The defence is approximately 2,030 m in length, and the stepped sea wall/ promenade is indicated to have a crest level of 6.50 m AOD and is considered to be in “good condition”.

⁷ https://datamap.gov.wales/layergroups/geonode:nrw_flood_defence_structures

The West Parade Sea Wall affords protection on the West Shore, is approximately 710 m in length and is indicated to have a crest level of 6.75 m AOD. The defence is considered to be in “fair condition”. Higher ground is also present to the south of the defence, which rises to in excess of 10.0 m AOD.

The Conwy Tidal Flood Risk Assessment⁸ provides further details regarding the above-mentioned flood defences as summarised in **Table 1**.

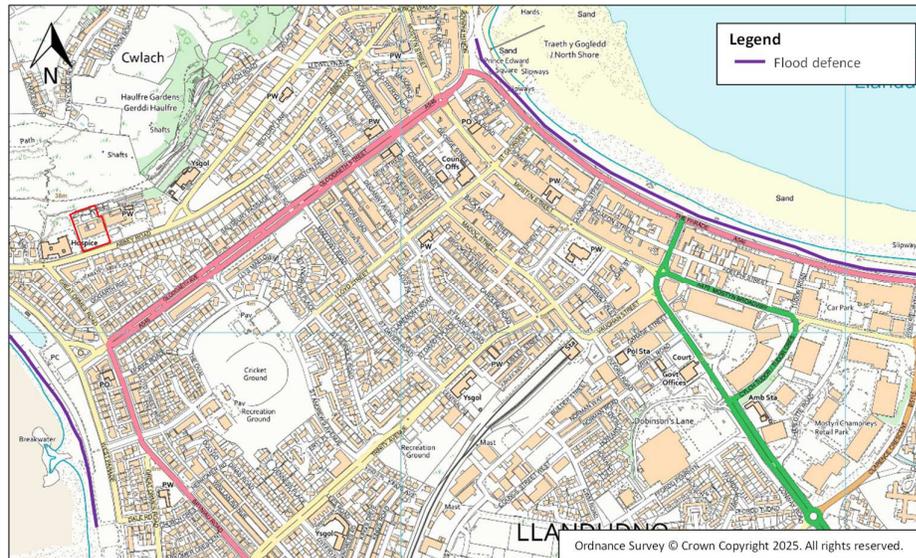


Figure 5: Flood Defence Assets

Source: NRW website; Accessed: February 2025

Table 1: Conwy Tidal Flood Risk Assessment Defence Details

Source: Conwy Tidal Flood Risk Assessment Stage 1, Conwy County Borough Council, May 2008

Defence	Existing Defence Details			Crest Level (m AOD)		
	Primary	Secondary	Tertiary	Primary	Secondary	Tertiary
North Shore Promenade (Llandudno Promenade)	Recharged Beach	Stepped Sea Wall	Promenade and Dwarf Wall	5.00 - 5.80	5.70 - 6.60	7.00 - 7.80
West Parade Sea Wall (Llandudno West Promenade)	Recharged Shingle Beach	Stepped Sea Wall	Wave Return Wall	5.25 - 5.50	5.90	6.70

According to the EA’s Coastal Flood Boundary Conditions for the UK: 2018 Update⁹, the peak still tidal levels presented in **Table 2** are expected adjacent to the site.

TAN15 requires an allowance for climate change to be made. Using the allowance set out in Welsh Government guidance and a development lifetime of 100 years, this allowance has been calculated as 0.98 m (70th Percentile; 70P) and 1.36 m (95th Percentile; 95P). The peak still tidal levels accounting for climate change are also presented in **Table 2**.

The Welsh Government climate change guidance states “as a minimum, development proposals should be assessed against the relevant regional 70th percentile... to inform design levels. An assessment should also be made against the 95th percentile to inform mitigation measures, access and egress routes and emergency evacuation plans”.

⁸ Conwy Tidal Flood Risk Assessment Stage 1 - Final Report, Conwy County Borough Council, May 2008 (Ref: EX 4667 (Release 3.0))

⁹ <https://data.gov.uk/dataset/73834283-7dc4-488a-9583-a920072d9a9d/coastal-design-sea-levels-coastal-flood-boundary-extreme-sea-levels-2018>

Table 2: Peak Still Tidal Levels

AEP Event	Peak Still Tidal Level (m AOD)	
	North Shore	West Shore
0.5% (2017)	5.33	5.24
0.1% (2017)	5.53	5.44
0.5% plus CC - (2125 - 70P)	6.31	6.22
0.1% plus CC - (2125 - 70P)	6.51	6.42
0.5% plus CC - (2125 - 95P)	6.69	6.60
0.1% plus CC - (2125 - 95P)	6.89	6.80

Wave overtopping and inundation analysis was assessed by HR Wallingford (on behalf of Conwy County Borough Council) as part of the Llandudno North and West Shore Coastal Flood Risk Analysis (January 2024) for the 0.5% and 0.1% AEP events (2022) utilising the peak still tidal levels taken from the EA's Coastal Flood Boundary Conditions for the UK: 2018 Update. Climate change was also considered for three epochs: 2040, 2070 and 2122 for the 70P scenario using the latest Welsh Government guidance (September 2021).

Two scenarios were considered as part of the modelling study for both the North and West Shore:

- “Business as Usual” assumes that the formal defences are maintained (overtopping); and
- “Walkaway” presents a scenario where the defences fail. This has been achieved by removing approximately 2 km of flood walls for the North Shore scenario, and removing the secondary flood walls for the West Shore scenario.

It should be noted that the “Walkaway” scenario represents a scenario that is considered to be unrealistic and far more conservative than what would ordinarily be required for planning purposes. In this case, a 50 m-wide breach would be more appropriate according to NRW guidance; however, no such breach scenarios have been assessed as part of the modelling study.

The available modelled outputs are provided in **Figure 6** and **Figure 7** respectively.

The modelled outputs indicate that no flooding of the site is expected from the North and West Shore during the “Business As Usual” (overtopping) scenario in up to a 0.1% AEP event +CC (2122, 70P).

Flooding along the southern boundary of the site is indicated during the “Walkaway” (conservative defence failure) scenario, with a maximum flood level of 7.26 and 7.38 m AOD expected at the site during the North Shore “Walkaway” scenario in a 0.5% and 0.1% AEP event +CC (2122, 70P) respectively. With ground levels in the existing car park typically indicated to be in the region of 7.1 - 7.6 m AOD and the presence of the existing rendered wall to the south at a height of 7.4 - 7.8 m AOD, flooding of only the lowered access points to the south-west and south-east of the site would be expected (where the site ties into existing highway levels). Flood extents at the site have been assessed more accurately using LiDAR data in comparison with the aforementioned modelled flood levels, as presented in **Figure 8**. This confirms that flooding is limited to the access points during the 0.5% AEP event +CC (2122, 70P) “Walkaway” scenario, with additional flooding in the north-west corner of the existing car parking area to depths below 100 mm during the 0.1% AEP event +CC (2122, 70P).

No flooding of Abbey Road is indicated from the North Shore “Business As Usual” (overtopping) scenario in up to a 0.1% AEP event +CC (2122, 70P). Whilst some flooding is indicated from the West shore, the maximum flood depth is not expected to exceed 0.2 m, with dry access available approximately 30 m to the east of the proposed site entrance.

The additional increase in sea level rise between the modelled year 2122 and the anticipated lifetime of the development (2125) is 0.03 m and is therefore unlikely to significantly affect the flood levels and depths indicated at the site.

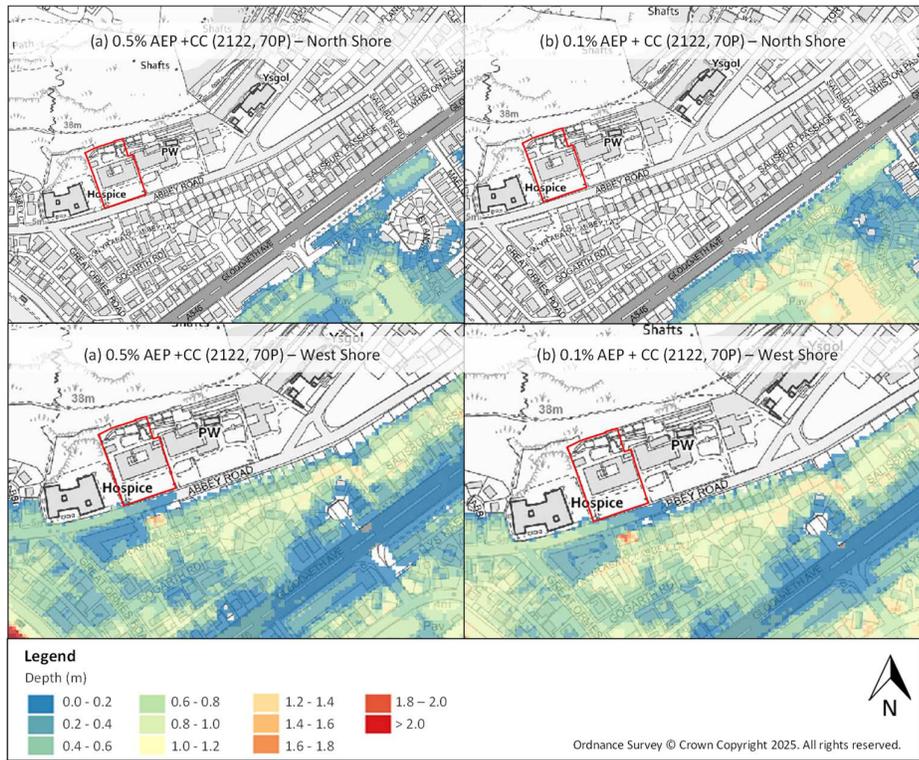


Figure 6: Llandudno North and West Shore Modelled Flood Extents - Business as Usual (Overtopping)

Source: Llandudno North and West Shores Coastal Flood Risk Analysis, HR Wallingford, January 2024

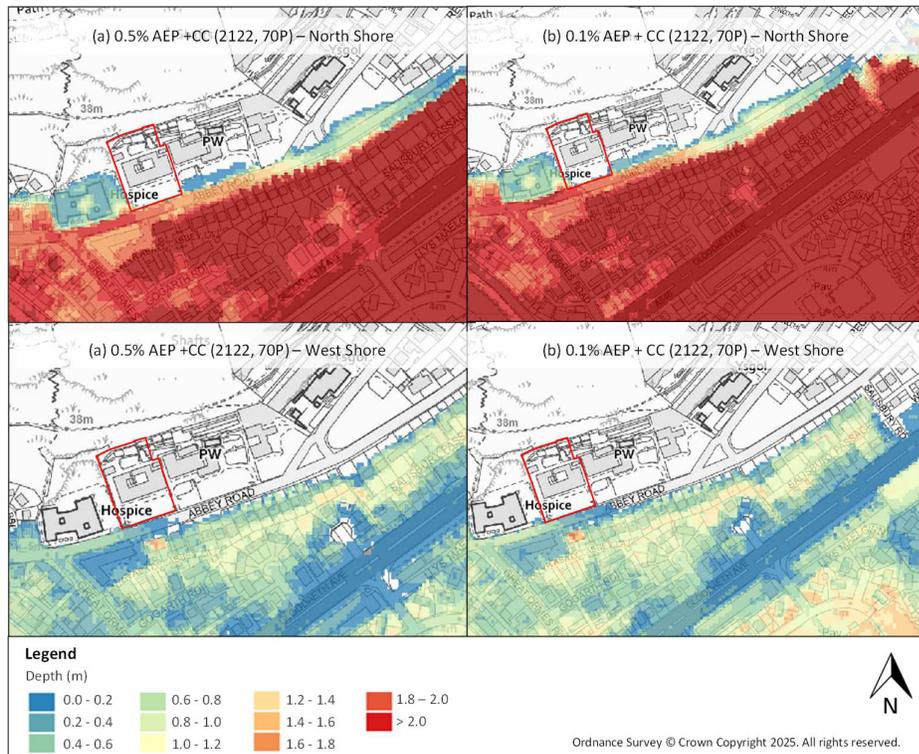


Figure 7: Llandudno North and West Shore Modelled Flood Extents - Walkaway

Source: Llandudno North and West Shores Coastal Flood Risk Analysis, HR Wallingford, January 2024



Figure 8: LiDAR Data Showing Land Above or Below Threshold Level

4.3 Flood Risk from Small Watercourses and Surface Water (Pluvial)

There are no small watercourses located within the vicinity of the site.

The Flood Map for Planning - Surface Water and Small Watercourses (**Figure 9**) indicates that the majority of the site is not at risk of flooding from pluvial surface water, except for the lowered courtyard in the centre of the existing building, which is shown to be in flood zone 3 and flood zone 2.

However, it is important to recognise that the Flood Map for Planning - Surface Water and Small Watercourses map is indicative and does not accurately represent local drainage systems in place. The topographic survey indicates the presence of manholes within the existing courtyard and as such, this is unlikely to be accounted for and consequently the indicated flood risk may be overestimated.

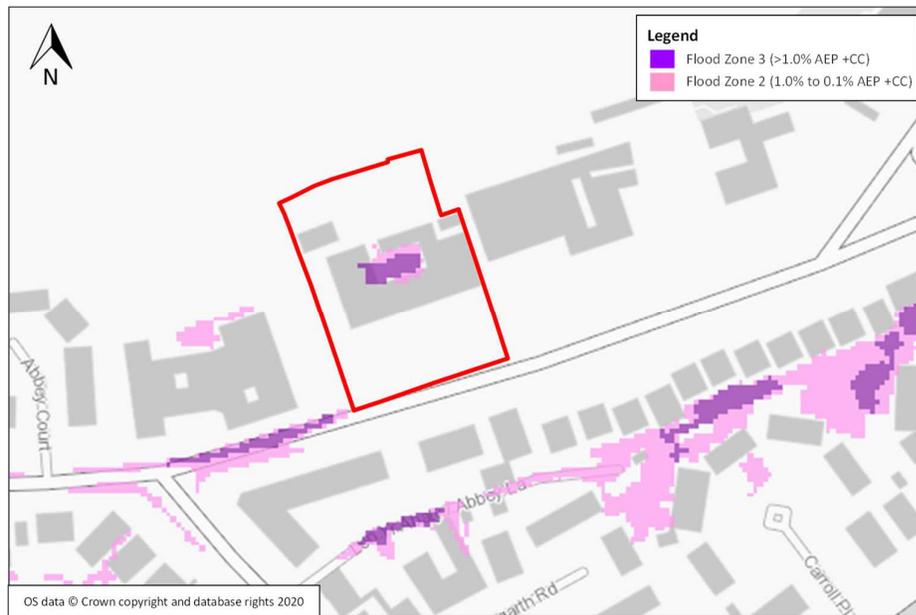


Figure 9: Flood Map for Planning - Surface Water and Small Watercourses

Source: NRW website; Accessed: February 2025

4.4 Flood Risk from Reservoirs, Canals and Other Water Impounding Structures

There are no canals or other impounded waterbodies located within the immediate vicinity of the site. The Flood Map for Planning - Flood Risk from Reservoirs (not shown) indicates that the site is not at risk of flooding from such sources.

4.5 Flood Risk from Groundwater

The JBA Groundwater Flood Risk Indicator map (**Figure 10**) indicates that groundwater levels within the southern and central part of the site may be between 0.5 - 5 m bgl (defined as Low risk), and >5 m bgl (defined as Very low risk) in the northern part, during a 1.0% AEP groundwater flood event.

Furthermore, given the extensive hardstanding nature of the existing site and surrounding area the emergence of groundwater at the surface is expected to be limited.

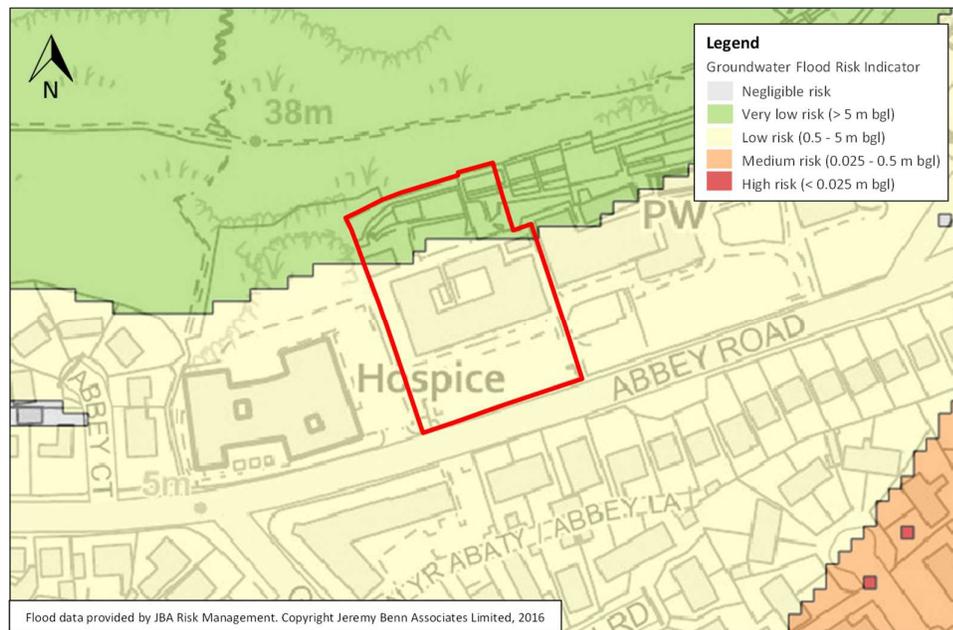


Figure 10: JBA Groundwater Flood Risk Indicator Map
Source: Blue Sky Maps; Accessed: February 2025

4.6 Flood Risk Mitigation

The risk of flooding to the proposed development from all identified sources is assessed to be low / negligible, with the exception of the unrealistic defence failure “Walkaway” scenario on the North Shore of Llandudno (tidal / coastal).

The risk of flooding to the proposed development will be mitigated through the implementation of the following measures:

- In accordance with A1.14 of TAN15 (2004), site levels including all ancillary areas should be set at a minimum of 7.26 m AOD. This is the maximum flood level expected at the site in a 0.5% AEP “Walkaway” event +CC (2122 - 70P). This will also ensure that the proposed development complies with A1.15 of TAN15 (2004) during a 0.1% AEP “Walkaway” event +CC (2122 - 70P). The following should be noted:
 - The proposals are to set ground levels on site at a minimum of 7.435 m AOD, with the car park to the east of the proposed bungalows set at a level of 7.350 m AOD (refer to black and white datum markers in **Appendix A**).
 - The new proposed retaining wall along the southern boundary of the site will be at a level of 7.500 m AOD, extending along the western boundary and to the west of the proposed access road this will infill the existing gap to the south-west of the site. This will subsequently prevent floodwater encroaching onto the site from the south during the modelled “Walkaway” scenarios.
 - To allow level access off Abbey Road, the proposed access road will fall below the recommended minimum level of 7.26 m AOD in the south; however, this will rise quickly above this to the north.
- FFLs should be set at a minimum of 7.64 m AOD, which is 380 mm above the flood level expected at the site in a 0.5% AEP “Walkaway” event +CC (2122 - 70P). - *Modelled flood levels for the 0.5% AEP “Walkaway” event +CC (2122 - 95P) are not available; however, a 380 mm difference between the 70P and 95P scenario sea levels was calculated within **Table 2** and this freeboard is therefore considered to be sufficient. It should also be noted that the “Walkaway” scenario is very conservative.*
- FFLs should be at least 0.15 m above adjacent ground levels following any reprofiling of the site, with ground levels sloping down from the buildings.
- It is recommended that a FWEP is prepared in consultation with Conwy County Borough Council emergency planning team. The site is included in a NRW flood alert and warning area. This provides the

opportunity for the relevant response procedures set out in the plan to be invoked in response to receipt of a flood warning from NRW.

These measures will, subject to the implementation of an appropriately designed surface water drainage scheme (prepared and reported separately by another consultancy), enable any potential overland flows to be conveyed safely across the site without affecting property.

4.7 Flood Risk Elsewhere

In accordance with A1.2 of TAN15 (2004) developers must ensure there will be no loss of flood flow or flood storage capacity for floods up to the severity of the 0.1% AEP event. Whilst not specified by TAN15 (2004), NRW generally recommends that this should be the case over the lifetime of development (i.e. should take into account climate change) and should consider breach where necessary.

Compensatory storage is generally not required for the loss of floodplain storage or conveyance during a tidally dominated event where the predicted water level is an extension of the water level within the sea.

This could be considered applicable for the North Shore “Walkaway” (conservative defence failure) scenario where all defences have been removed.

Nevertheless, an assessment of the impact of the proposals on flood risk elsewhere has been undertaken.

As previously stated, flooding at the site access points is indicated during the “Walkaway” (conservative defence failure) scenario, with a maximum flood level of 7.26 and 7.38 m AOD expected at the site during the 0.5% and 0.1% AEP event +CC (2122, 70P) respectively. Also, some shallow flooding may occur to part of the existing car park during the 0.1% AEP event +CC (2122, 70P).

As the access configuration along the eastern portion of the site is to be similar to the existing site post-development, no floodplain storage is expected to be lost within that area. Conversely, the western access is to be removed and raised. The flood extents within the western part of the site during the 0.5% and 0.1% AEP event +CC (2122, 70P) are measured to be approximately 90 and 200 m² in area respectively (as per **Figure 8**). The average ground level within those flooded areas is calculated to be 6.56 and 6.97 respectively, and based on the aforementioned flood levels this would equate to average flood depths of 0.70 and 0.41 m respectively. As such, the volume of displaced floodwater is calculated to be 63 and 82 m³ respectively for the 0.5% and 0.1% AEP events +CC (2122, 70P).

As topography falls away from the site to the south, floodwater would be expected to be displaced to the wider tidal flood extent occupying land at a lower level than the site. There is an approximate 2,224,600 m² area that is lower lying than the site located within the tidal flood extent. Displacing 82 m³ over this area would result in a negligible increase of 0.00004 m assuming that this would be uniformly spread across the floodplain. It is therefore considered unlikely that the proposals will have any material impact on flood risk elsewhere. It should also be considered that this is all based on the “Walkaway” (conservative defence failure) scenario, which is far in excess of what would ordinarily be required for planning purposes and the impact of a typical defence breach scenario would be expected to be significantly less.

5 SUMMARY AND RECOMMENDATIONS

This report has been prepared on behalf of Enfys Development Limited and relates to the proposed redevelopment of the western part of Loreto Convent, Abbey Road, Llandudno for residential use.

The Development Advice Map indicates that most of the site is located in zone A; however, the south-western corner is shown to partially fall within zone C1.

The Flood Map for Planning - Rivers and Sea indicates that the site is not at risk from flooding from rivers or the sea except for the southern boundary, which is shown to be in flood zone 3 (sea) and in a TAN15 defended zone.

An assessment of flood risk from all identified potential sources of flooding has been undertaken using best available information. The risk of flooding to the proposed development is assessed to be negligible / low with the exception of flooding from the unrealistic defence failure (“Walkaway”) scenario from the North Shore of Llandudno (tidal/ coastal), where some flooding could impact the access points to the site (although the vast majority of the site would be expected to remain dry).

The risk to the proposed development will be mitigated through the implementation of the following measures:

- Site levels including all ancillary areas to be set at a minimum of 7.26 m AOD - *To allow level access off Abbey Road, the proposed access road will fall below the recommended minimum level in the south; however, this will rise quickly above this to the north.*
- FFLs to be set at a minimum of 7.64 m AOD and at least 0.15 m above adjacent ground levels following any reprofiling of the site, with ground levels sloping down from the buildings.
- FWEP to be developed in consultation with Conwy County Borough Council

The proposals would not be expected to have an adverse impact on flood risk elsewhere.

APPENDIX A

Proposed Site Plan

- PROPOSED BUILDINGS
- LANDSCAPED AREAS
- PAVING
- TARMAC
- SPEN LOCATION
- BIN STORE
- EXT. LEVEL

LOCATION OF INTERNAL SCOOTER & CYCLE STORE
10 CYCLE SPACES
(ASSUMED 1 SPACE PER SKO BEDS)

STONE FACED RETAINING WALL TOPPED WITH BLACK RAILING

WALLED COMMUNAL DRYING AREA SITUATED TO NORTH WEST CORNER OF COMMUNAL GARDEN

STONE BOUNDARY WALL TO BE RETURNED ALONG BOUNDARY TOPPED WITH BLACK RAILING

EXISTING OPENING TO BE REMOVED AS PART OF NEW RETAINING WALL CONSTRUCTION

LIGHTWEIGHT PLANTING TO FRONT RETAINING WALL

EXISTING WALL TO BE REMOVED AND NEW STONE FACED RETAINING WALL TO BE RE-INSTATED TOPPED WITH BLACK RAILING

RETAINING WORKS TO BE DETERMINED PROPOSED STEPPED ACCESS TO TIERED GARDEN FINAL ARRANGMENT TO BE AGREED

AREA OF DEMOLITION TO BE RETAINED AND LANDSCAPED

COMMUNAL BIN STORE TO BE ENCLOSED WITH 1.8M TIMBER FENCING

EXISTING BUILDING REMOVED SHOWN DASHED RED

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PROPOSED SITE PLAN



PROJECT LORETO CONVENT LANDSCAPE	CLIENT WALES & WEST	DRAWING NUMBER D-1420-07/23 PLOO	REVISION SCALE C 1:250 @A2	DATE OCT 2024
DRAWING TITLE PRO. SITE PLAN				DRAWN: RP
MATTHEW JONES ARCHITECTS				
115 STATION ROAD DEGANWY CONWY LL31 9EJ				
				E: admin@matthewjonesarchitects.com T: 01492 583038

- C ADDITIONAL LEVELS 17/02/25
- B BUNGALOW SPACING AND RETAINING WALL TO TERRACED GARDEN 29/01/25
- A RW FINISH, PARKING HO'S & LEVELS 12/12/24

APPENDIX B

Topographical Survey

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- Flood Risk Assessments
- Flood Consequences Assessments
- Surface Water Drainage
- Foul Water Drainage
- Environmental Impact Assessments
- River Realignment and Restoration
- Water Framework Directive Assessments
- Environmental Permit and Land Drainage Applications
- Sequential, Justification and Exception Tests
- Utility Assessments
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