



Hayston Developments & Planning Ltd

PONDEROSA, BRITON FERRY

Flood Consequences Assessment





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TYPE OF DOCUMENT (VERSION) PUBLIC

PROJECT NO. 70106721

OUR REF. NO. 6721-WSP-XX-XX-RP-C-001

DATE: MARCH 2023

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QUALITY CONTROL

Issue/revision	First issue	Revision 1	Revision 2	Revision 3
Remarks	First Issue			
Date	March 2023			
Prepared by	Daniel Murdoch			
Signature				
Checked by	Richard Curtis			
Signature				
Authorised by	Andrew Wilkinson			
Signature				
Project number	70106721			
Report number	6721-WSP-XX-XX-RP-C-001 R00			
File reference	\\Central Data\Projects\70106xxx\70106721 - Ponderosa, Briton Ferry FCA\03 WIP\CV Civil Engineering\05 Reports\C-001 FCA			

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1 INTRODUCTION

WSP (UK) Ltd has been appointed by Hayston Developments & Planning Ltd to undertake a Flood Consequence Assessment (FCA) for a development at Church Street, Briton Ferry, Neath, SA11 2HZ. This Flood Consequence Assessment has been undertaken in accordance with Technical Advice Note 15 and is based on data provided by the client and licensed from Natural Resources Wales (NRW).

To help ensure that the level of detail of an FCA is proportionate to the degree of flood risk, the Construction Industry Research and Information Association (CIRIA) has defined a tiered three-level approach to flood risk assessment as follows:

- Level 1 Screening study to identify whether there are any flooding issues related to a development site which may warrant further consideration;
- Level 2 Scoping study to be undertaken for each potential flood risk issue that is identified as being associated with a site during a Level 1 FCA. A Level 2 FCA involves a qualitative assessment of the flood risk to the site, and the impact of the site on flood risk elsewhere; and
- Level 3 Detailed study to be undertaken if the Level 2 study concludes that quantitative analysis is required to assess flood risk issues related to the development site.

In the case of the currently proposed development site, a Level 2 study is considered sufficient to support the planning application and allow Neath-Port Talbot Council to consider/determine the application.

1.1 SITE LOCATION

The location of the site, illustrated in Figure 1-1, and is located at Ordnance Survey National Grid Reference 273940, 194060. This locates the site to the south of Church Street; north of the A48; east of the historic Bethesda Chapel; and west of the South Wales Main Line. The site is currently a rough hardstanding area. In 2021 the site received planning permission for 9no. garage units (P2021/0144), but it is understood this was not developed out.

Ground levels within the site fall from approximately 7.96mAOD at the north-eastern boundary, to 7.27mAOD at the north-western boundary, falling from east to west.

1.2 HYDROLOGICAL ENVIRONMENT

The site lies approximately 600m to the east of the Afon Nedd (River Neath) which routes in a north-east to south-west direction.

The site also lies approximately 300m to the north of the Historic Briton Ferry Dock, which in the past extended further to the north, to a point adjacent to the site. Historically, a water level within the inner dock area was retained by a lock mechanism, however, it is understood that this is no longer the case, and that the inner basin is largely filled, with water levels in the outer dock area, some 450m from the site, controlled by the tides. The site also lies approximately 450m to the west of the Jersey Canal, which is understood to adjoin the Afon Nedd approximately 525m to the west of the site.

Other notable waterbodies identified in proximity to the site are the Cefn-Cwrt Reservoir, and the historic reservoir on the Nant-yr-Allwys, which lie 1.3km and 1.2km from the site, respectively.

There are no known flood defences in proximity to the site.

1.3 GEOLOGY

According to the British Geological Survey 50k mapping¹ the site lies on pennant sandstones forming part of the Rhondda member, overlaid with superficial tidal flat deposits comprised of mud and sand.

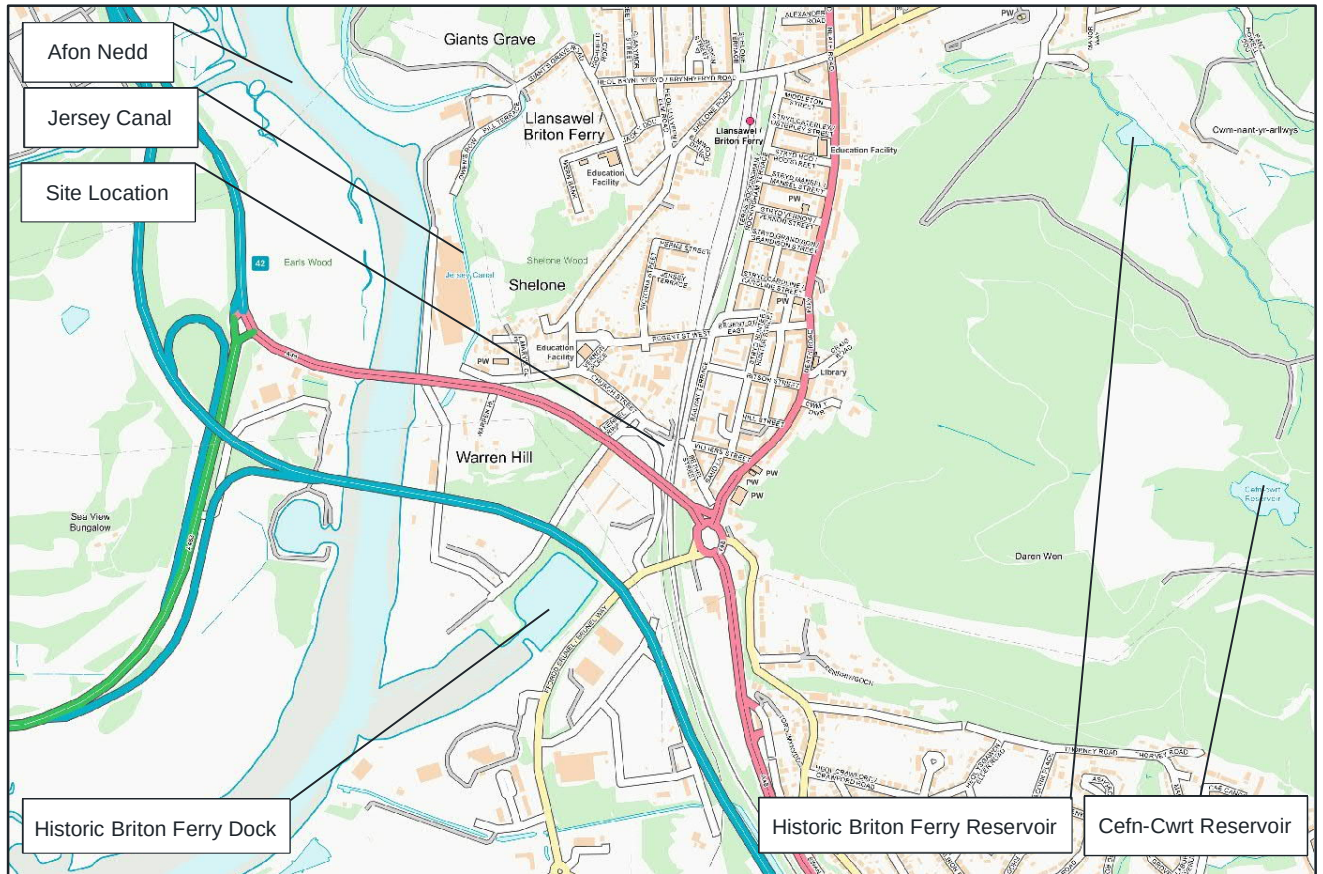


Figure 1-1: Site Location

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1.4 DEVELOPMENT PROPOSAL

The proposed development is for creation of a traveller's pitch, comprising a residential static caravan, touring caravan, a utility/day room, erection of a boundary fence, and storage shed. These proposals are illustrated in Figure 1-2.

The most vulnerable use classification should be used in FCAs, and according to TAN15² the proposed development includes uses classed as Highly Vulnerable and Less Vulnerable. TAN15 recommends that Highly Vulnerable development may be acceptable within Development Advice Map Zone B, subject to consideration of the extreme (0.1% Annual Exceedance Probability (AEP)) flood level, and acceptability of flood consequences, provision of suitable evacuation procedures and plans,

¹ British Geological Survey, 2022. *50k Geology Bedrock and Superficial Deposits*. Available at: <https://mapapps2.bgs.ac.uk/geoindex/home.html>. [Accessed 11th May 2022].

² Welsh Assembly Government, 2004. *Technical Advice Note 15: Development and Flood Risk*. Cardiff: Welsh Assembly.

and no increase in flooding elsewhere. Less Vulnerable development may be acceptable within DAM Zone B, subject to acceptability of flood consequences, and no increase in flood risk elsewhere.

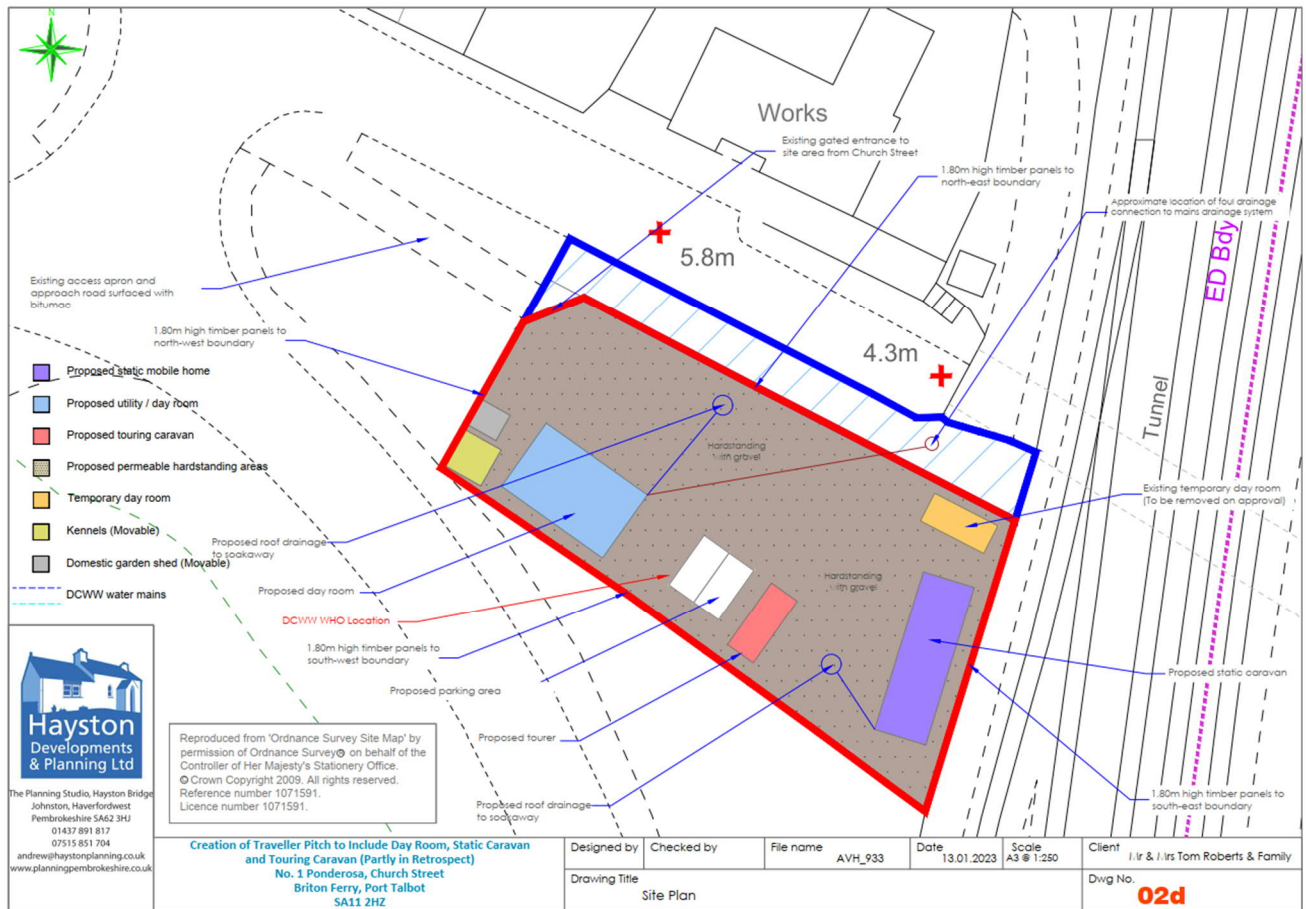


Figure 1-2: Site Proposals

Extract of Hayston Planning and Developments Drawing ref. 02d, Revision 13th January 2023.

2 EXISTING FLOOD RISK

The site is considered to be at a low risk of flooding from most sources, but at a high risk from tidal flooding; this section first considers the key online flood maps from Natural Resources Wales (NRW) (S2.1), followed by historic flood data (S2.4), and then consideration of strategic planning documents and policy (S2.5).

2.1 NATURAL RESOURCES WALES FLOOD MAPS

This section considers the flood risk illustrated by NRW's publicly available flood maps³. A full set of flood maps for the site is included within Appendix B.

2.1.1 DEVELOPMENT ADVICE MAP

The current DAM shows that the site lies within DAM Zone B, as illustrated in Figure 2-1.

According to TAN15, DAM Zone B is defined as an area known to have flooded in the past, and for areas located within DAM Zone B, consideration of the 0.1%AEP flood event should be made.

It should be noted that the DAM is considered by NRW to be out of date as there have been no updates for over two years and no future updates are anticipated.

³ Natural Resources Wales, 2023. *Long-term flood risk*. Available at: <https://naturalresources.wales/floodriskmap?lang=en>. [Accessed March 2023] Contains Natural Resources Wales information, © Natural Resources Wales Copyright and database right 2023.

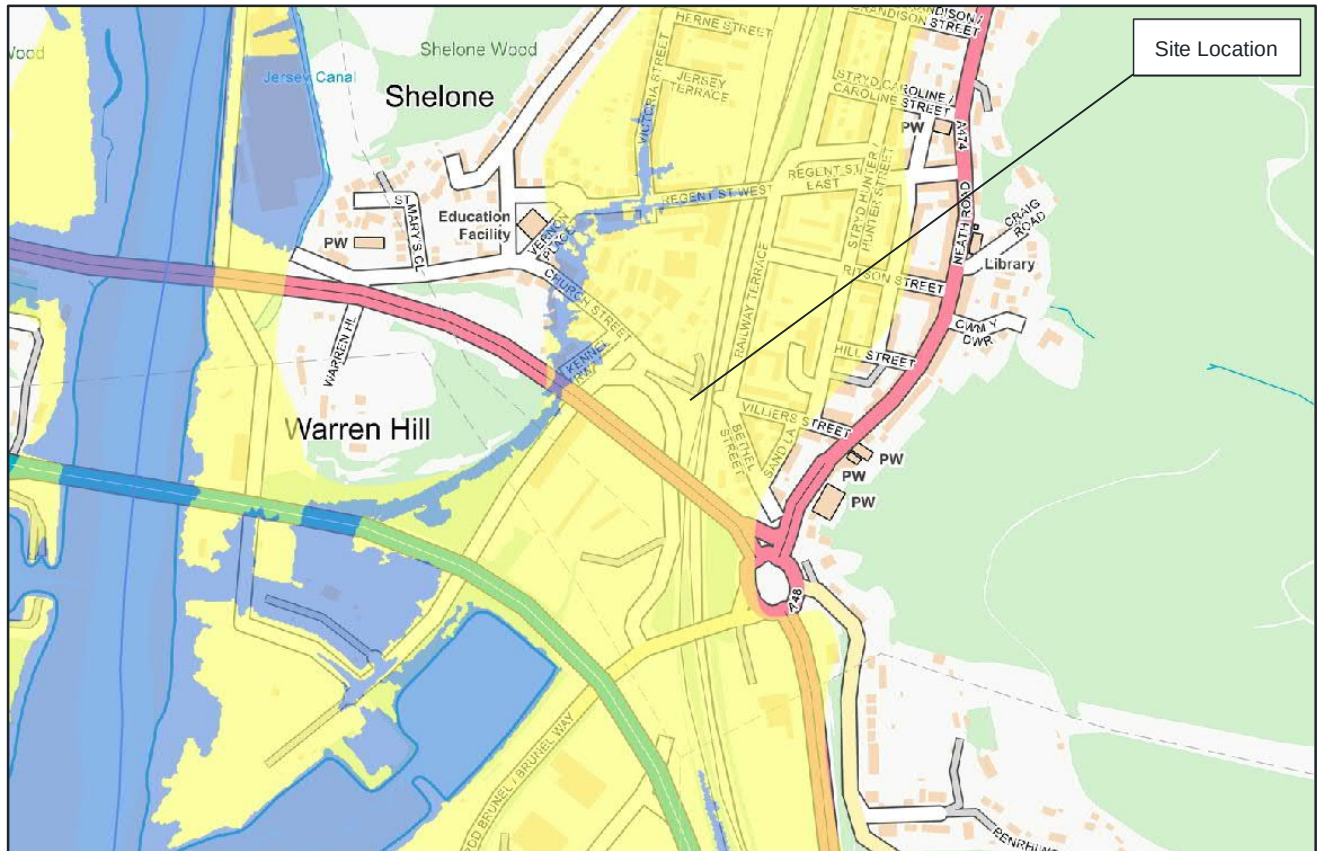


Figure 2-1: NRW Development Advice Map

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A further area of interest at low risk of surface water flooding in proximity to the site is an extent on Wharf Road, located to the west of the site. In addition, an area of Church Street to the east of the site is shown to be at low risk of flooding, along with areas along Villiers Street and Bethel Street to the west of the site.

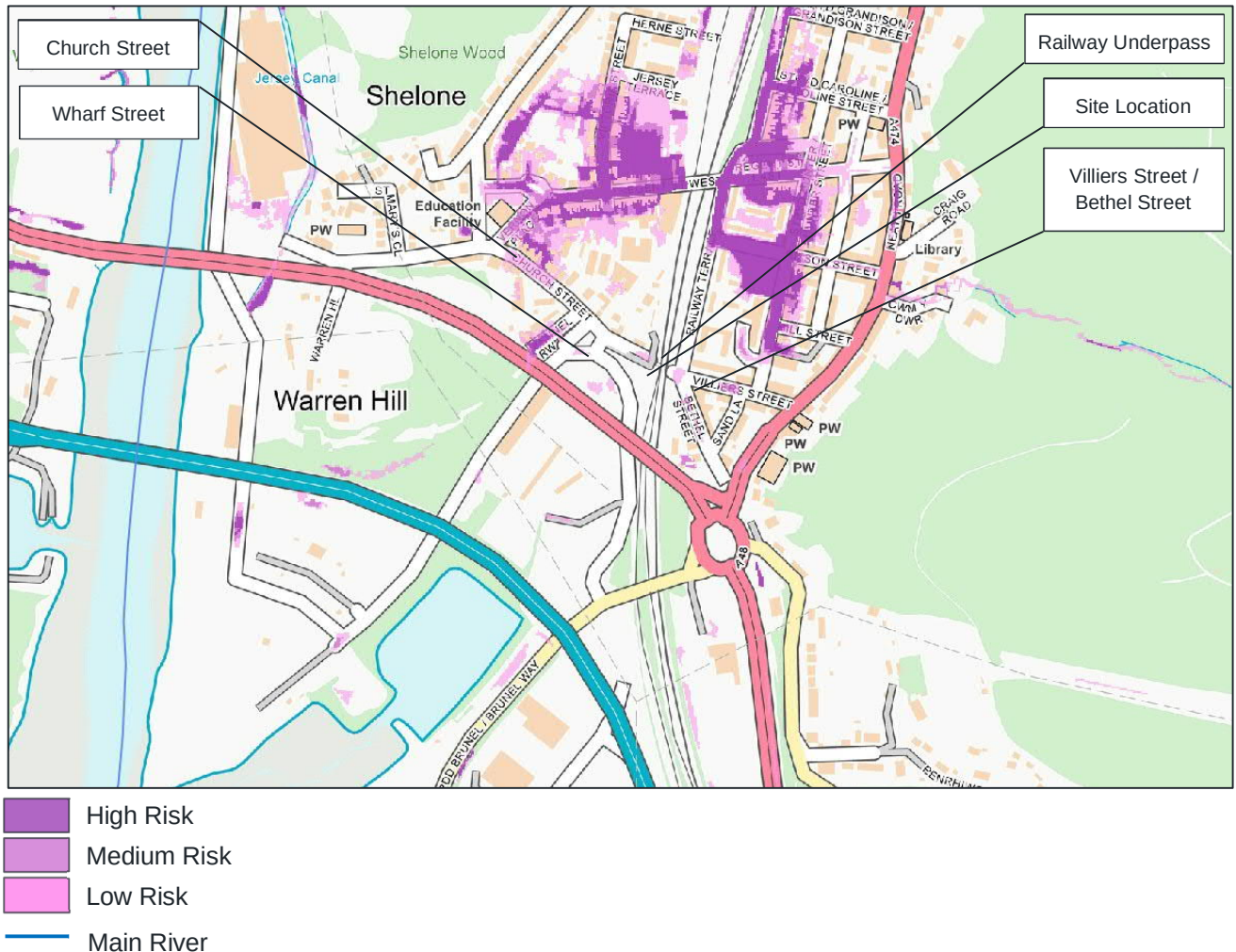


Figure 2-3: NRW Flood Risk from Surface Water and Minor Watercourses

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It is noted that pluvial flood models that are typically used to generate surface water flood risk mapping often do not include local drainage systems, and may not include culverts on minor watercourses, and as such, may overestimate flood risk at certain locations. As such, it is possible that flood risk may be overestimated within the areas discussed.

2.1.4 FLOOD RISK FROM THE SEA

NRW's flood risk from the sea mapping, reproduced in Figure 2-4, shows that the site includes a minor area at the north-western corner which is considered to be at low risk of flooding from the sea.

Beyond the site perimeter itself, the majority of the immediate area, including large parts of Briton Ferry, is considered to be at high risk of flooding from the sea, including Church Street, Wharf Road, and Villiers Street.

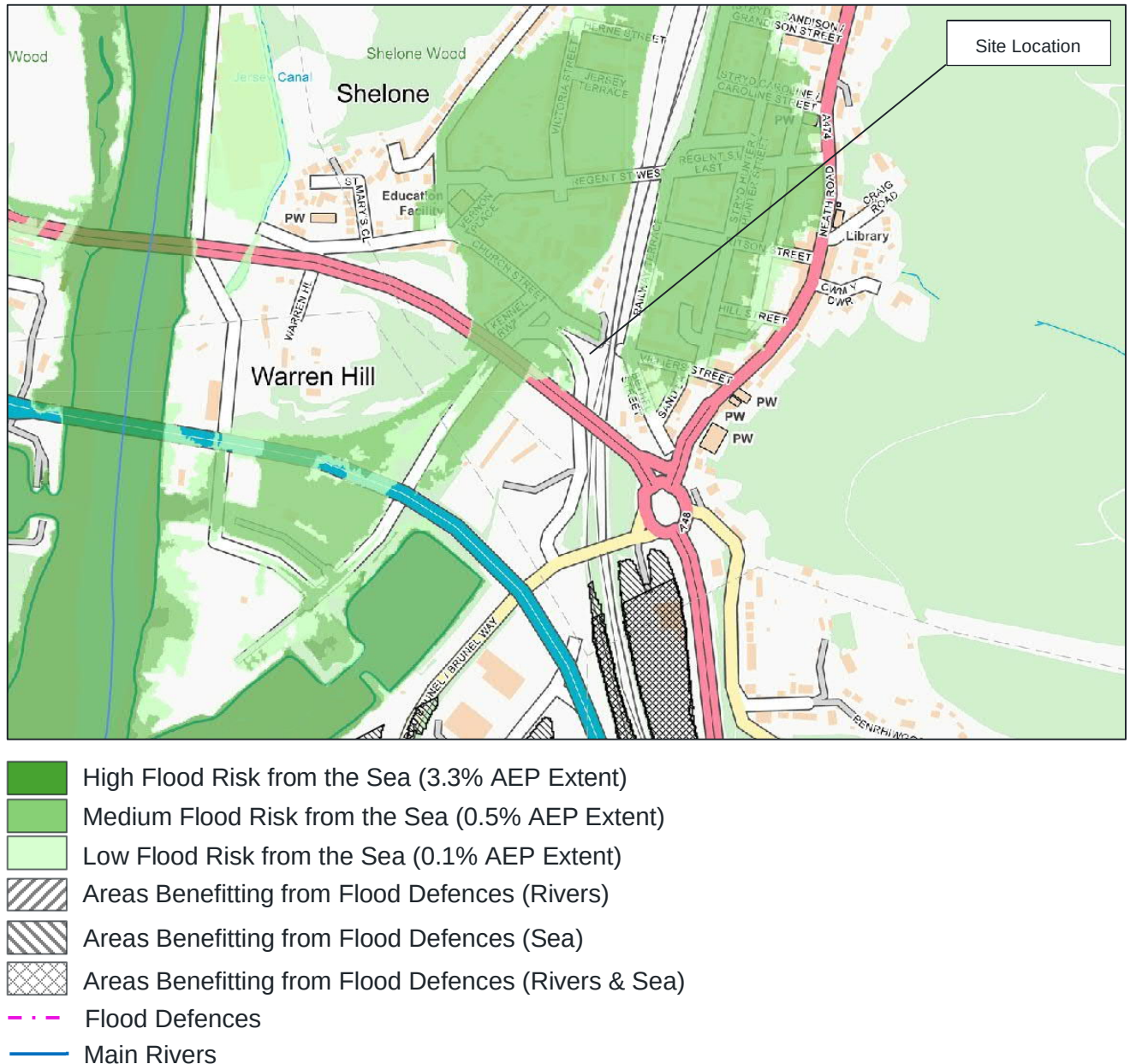


Figure 2-4: NRW Flood Risk From the Sea

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2.1.5 NRW FLOOD MAP FOR PLANNING

In September 2021, NRW released the Flood Map for Planning⁴ (FMfP) in support of the updated TAN15, which has been postponed to June 2023. Whilst the FMfP has no bearing on the criteria under the current TAN15, it does require consideration.

The Flood Map for Planning illustrates the extents of modelled flood risk from surface water and minor watercourses, fluvial sources, and tidal sources. This information includes a predicted future level of risk, accounting for the effects of climate change.

The FMfP, illustrated in Figure 2-5, shows that flood risk from the sea at the site is increased relative to that illustrated in Figure 2-2, with a large part of the site illustrated as at high risk of flooding, and additional areas at low risk, and an extent considered to be at minimal / no risk.

⁴ NRW, 2022. *Flood Map for Planning*. Available at: <https://flood-map-for-planning.naturalresources.wales/>. [Accessed 21st February 2023].

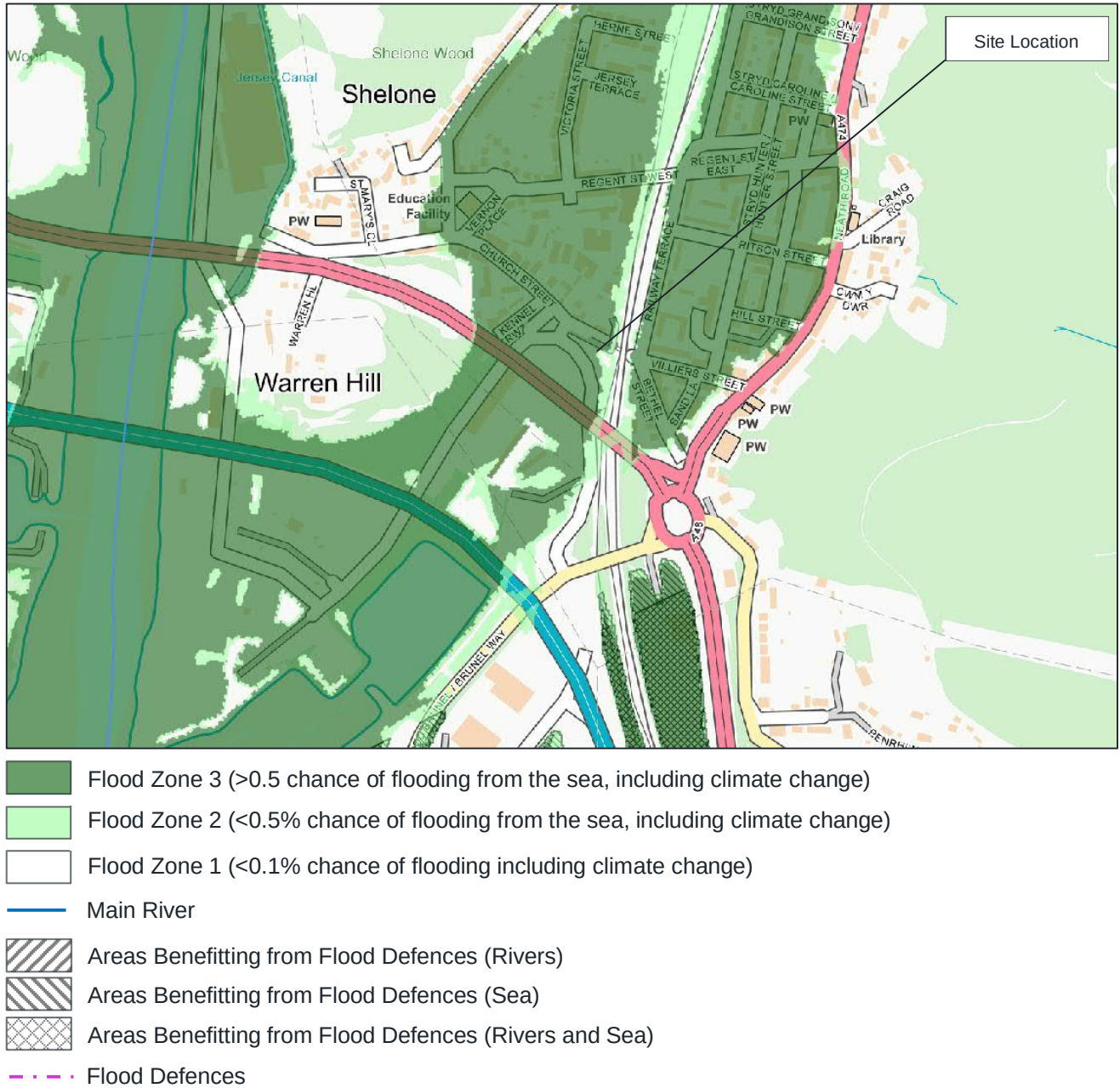


Figure 2-5: Flood Map for Planning (Sea)

Contains Ordnance Survey Data, © Crown Copyright and database right 2023.

Consideration of surface water within the Flood Map for Planning, reproduced in Figure 2-6, shows increased levels and extents of surface water flood risk in proximity to the site relative to those illustrated in Figure 2-3.

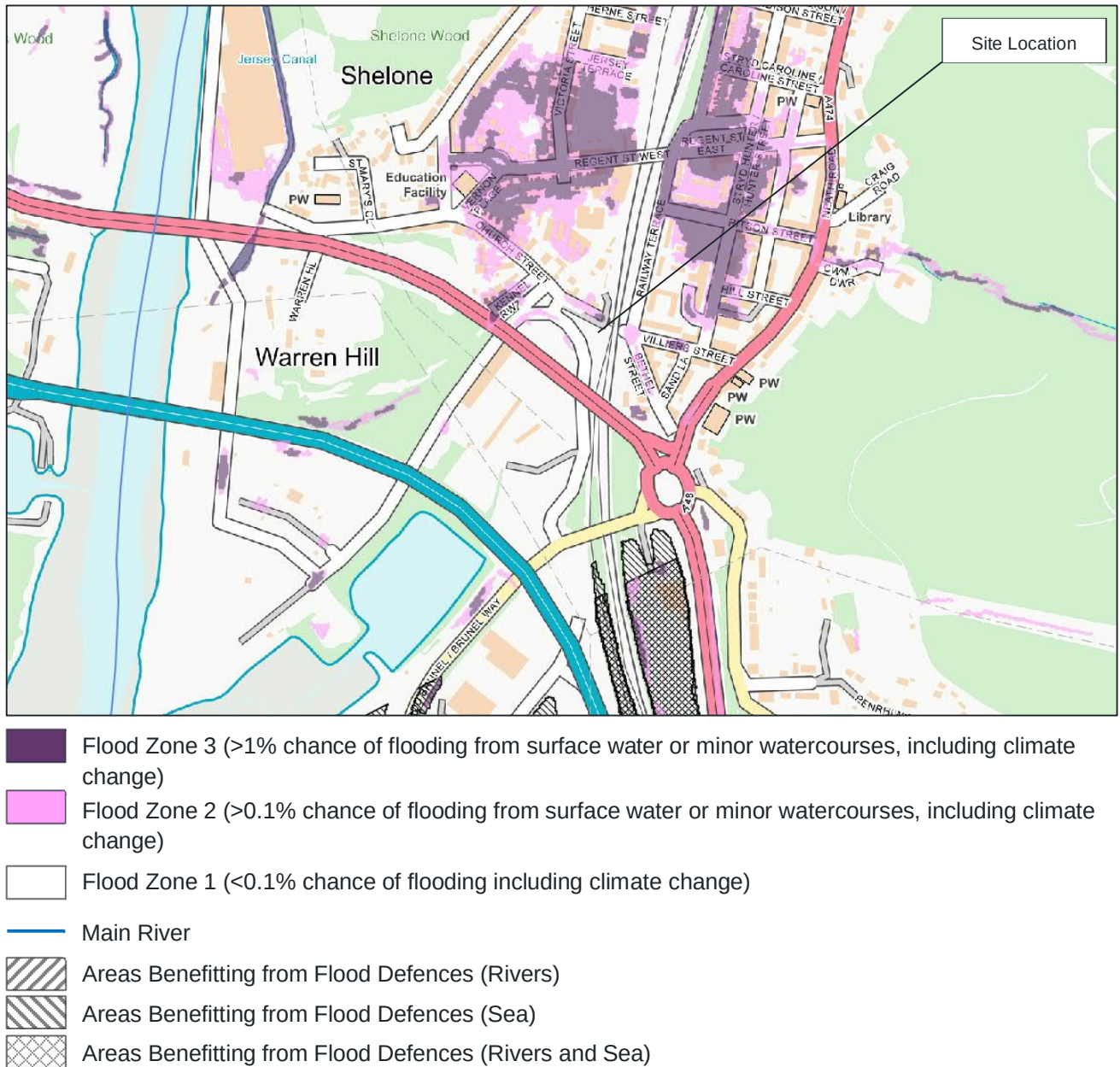


Figure 2-6: Flood Map for Planning (Surface Water and Minor Watercourses)

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2.2 NRW AND EA DATASETS

2.2.1 EXTREME SEA LEVELS

The rise in sea levels has also been considered and the change in extreme sea levels assessed for the nearest data point up to 2125 using the Environment Agency's Extreme Sea Level (ESL) dataset⁵,

⁵ Environment Agency, 2021. *Coastal Design Sea Levels – Coastal Flood Boundary Extreme Sea Levels (2018)*. Bristol: Environment Agency.

in line with current Welsh Government Guidance⁶. The guidance refers to both the 70th and 95th climate change (cc) percentile scenarios which relate to the uncertainty intervals of the anticipated sea level rise.

This assessment indicates that by the end of the development's lifespan a design event extreme sea level of approximately 7.52mAOD could be anticipated (70th cc percentile, 0.5%AEP), assuming a lifespan extending until 2120, and an extreme event sea level (70th cc percentile, 0.1%AEP) of 7.78mAOD.

Guidance also states that consideration of the 95th cc percentile scenario should be made, with consideration of the implications of this higher level on access and egress, requirements for flood mitigation measures, and evacuation plans. The predicted sea level in the year 2120 for the 95th cc percentile (0.5%AEP) is estimated to be 7.90mAOD, and in the extreme event (95th cc percentile, 0.1%AEP) of 8.16mAOD. Refer to Table 2-2 for a summary table of the events of interest. It should be noted that the EA's ESL data also includes a confidence estimate, the 95% confidence interval for these data is also listed for reference, but is not discussed in NRW's guidance.

Figure 2-7 illustrates the anticipated rise in extreme sea level for the 5%, 0.5% and 0.1% Annual Exceedance Probability events at the 70th cc percentile confidence level.

Annual Exceedance Probability (AEP) is the probability of an event of this magnitude or greater occurring in any given year. A set of probabilities and corresponding return period are quoted in Table 2-1.

Table 2-1: Annual Exceedance Probability and Return Period Equivalence

Return Period (1 in X Years)	2	5	10	30	50	75	100	200	1000
AEP (%)	50	20	10	3.3	2	1.3	1	0.5	0.1

The equivalence⁷ reported in Table 2-1 holds for return periods substantially greater than one year.

⁶ Welsh Government, 2022. *Adapting to Climate Change: Guidance for Flood and Coastal Risk Management Authorities in Wales*. Cardiff: Welsh Government.

⁷ The equivalence $AEP \approx 100 \left(\frac{1}{RP} \right)$ as reported in table should more accurately be $AEP = 100(1 - e^{(-1/RP)})$

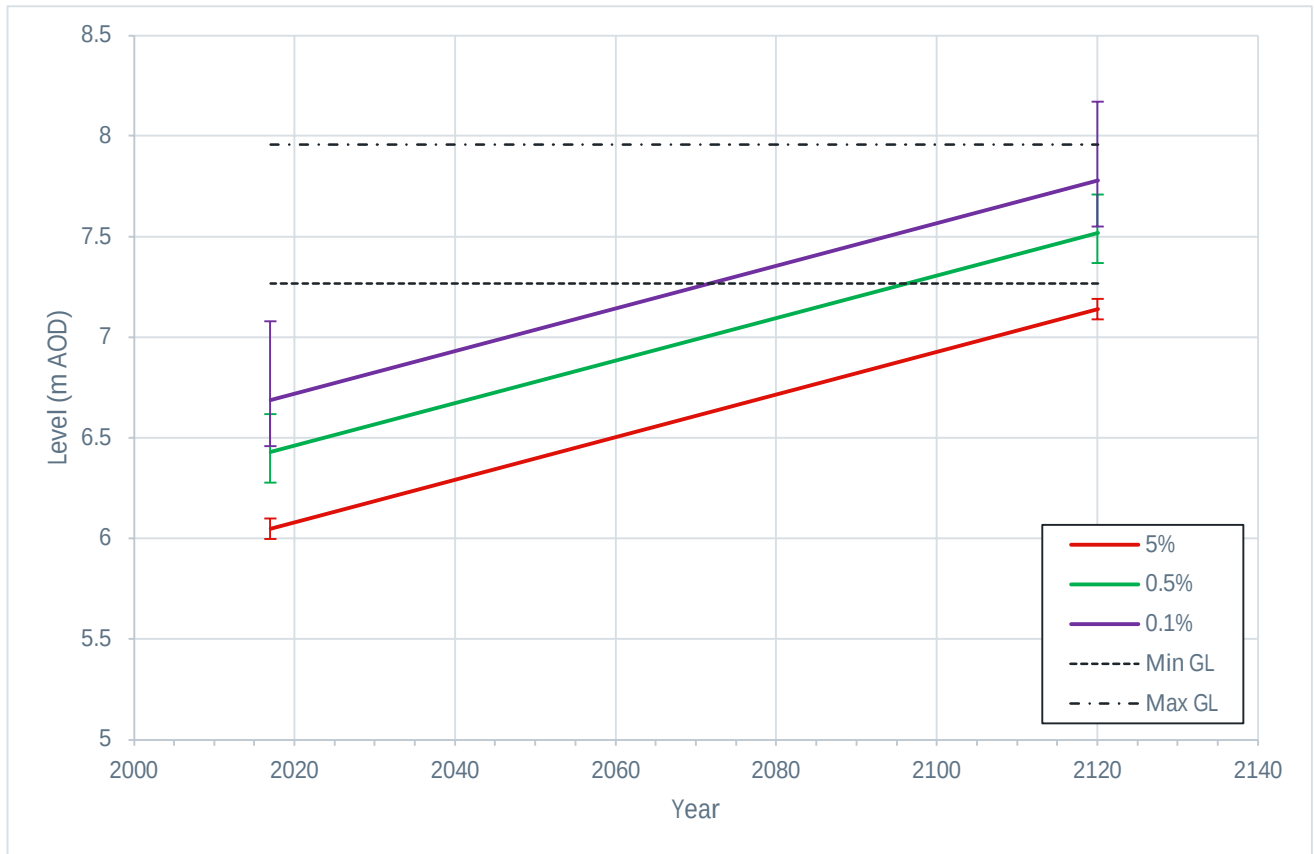


Figure 2-7: Extreme Sea Levels (70% Confidence Scenario)

With the minimum site level of approximately 7.3mAOD, the extreme sea levels illustrated in Figure 2-7 show that the existing site may be affected by tidal flood waters in the 0.5%AEP event by mid-to-late century, and by the extreme (0.1%AEP) event by mid-century.

The prediction that the 0.5%AEP tidal event may affect the site is also reflected by NRW's Flood Map for Planning, discussed in Section 2.1.5, which includes allowances for climate change.

It is noted that these estimates, reproduced in Table 2-2 and Table 2-3, have been derived using baseline data for a point within the estuary of the Afon Nedd, and as such, make a limited allowance for estuary funnelling or throttling of the propagation of tidal levels etc. within the estuary and river upstream of the baseline location. Furthermore, these are still water levels only and make no allowance for waves or other local environmental variables.

The key event of interest when considering tidal flooding has been highlighted in **blue** in Table 2-2.

Table 2-2: Estimated Extreme Sea Levels 70th Percentile (Neath Estuary Chainage 484-2)

Year	Annual Exceedance Probability					
	5%		0.5%		0.1%	
	Prediction	95% Confidence	Prediction	95% Confidence	Prediction	95% Confidence
Base (2017)	6.05	6.00	6.43	6.28	6.69	6.46
		6.10		6.62		7.08
2120	7.14	7.09	7.52	7.37	7.78	7.55
		7.19		7.71		8.17

Table 2-3: Estimated Extreme Sea Levels 95th Percentile (Neath Estuary Chainage 484-2)

Year	Annual Exceedance Probability					
	5%		0.5%		0.1%	
	Prediction	95% Confidence	Prediction	95% Confidence	Prediction	95% Confidence
Base (2017)	6.05	6.00	6.43	6.28	6.69	6.46
		6.10		6.62		7.08
2120	7.52	7.47	7.90	7.75	8.16	7.93
		7.57		8.05		8.55

2.2.2 NRW PRODUCT 6 DATA

Flood risk and modelling information (Product 6) has been requested from NRW, but at the time of writing has not been received.

2.3 FLOOD RISK FROM OTHER SOURCES

The site is not shown as within a risk area associated with modelled reservoir failures on NRW's mapping. However, it is noted that the Cefn-Cwrt and historic Briton Ferry reservoirs are not included in the mapping at the time of writing, and as such, the risk associated with these features may not be fully understood.

It is not known if these features are of sufficient size ($>10,000\text{m}^3$) to be subject to the Reservoirs Act but given the plan area on available mapping it is probable that it is subject.

A small pond feature is located to the south-east of the site, however, examination of ground levels indicates a probable flow path from this feature towards the docks area, and as such, it is not considered that this water body poses any significant flood risk to the site.

The Jersey Canal is also located in proximity to the site, however, examination of ground levels indicates that this lies at a level below the site, and as such is not considered to pose a significant risk to the site.

Welsh Water information illustrates that a strategic 43" water main routes adjacent to the application site, within the applicant's land ownership. Given the topography of the site and the surrounding area, and with the careful design of the site's external levels, the risk of flooding from this source would be low.

2.4 HISTORIC FLOOD DATA

The NRW online mapping⁸ does not record any historic flood outlines covering the site, however, the site is located within DAM Zone B, indicating that it is understood from geological records to have flooded in the past.

A search of the Chronology of British Hydrological Events for "Briton Ferry", and "Llansawel" did not reveal any relevant results.

A review of internet news sources highlights flooding in Briton Ferry in 2007⁹, 2020¹⁰, and 2022^{11,12}, however, no reports have been found that describe flooding at the site or in the immediate vicinity.

These details show that the site itself appears to have a limited record of flooding. However, the wider area's reported flood history indicates that the need to consider this risk is not insignificant.

2.5 PLANNING POLICY AND DOCUMENTS

2.5.1 STRATEGIC FLOOD CONSEQUENCE ASSESSMENT

Review of the Strategic Flood Consequences Assessment for Neath-Port Talbot¹³ indicates that the site is not allocated under the Local Development Plan¹⁴. The SFCA states that "*Overall groundwater is not believed to be a major source of flooding*" within the county.

⁸ Natural Resources Wales, 2021. *Historic Flood Outlines*. [Accessed 21st February 2023].

⁹ BBC News, 2007. *Flood rescues in Powys villages*. Available at: <http://news.bbc.co.uk/1/hi/wales/mid/6911303.stm>. [Accessed 21st February 2023].

¹⁰ Wales Online, 2020. *Council hands out sandbags as significant flooding affects parts of Neath and Port Talbot*. Available at: <https://www.walesonline.co.uk/news/wales-news/council-hand-out-sandbags-significant-17834407#>. [Accessed 21st February 2023].

¹¹ Wales Online, 2022. *'My Tesla started floating off as the street flooded and I was stuck inside'*. Available at: <https://www.walesonline.co.uk/news/wales-news/flooding-neath-tesla-submerged-water-25437910>. [Accessed 21st February 2023].

¹² Wales Online, 2022. *Vintage shop devastated as floodwater flattens garden wall and pours in*. Available at: <https://www.walesonline.co.uk/news/wales-news/vintage-shop-devastated-floodwater-flattens-25435123>. [Accessed 21st February 2023].

¹³ Neath-Port Talbot County Borough Council, 2014. *Strategic Flood Consequences Assessment (Stage 1 & 2)*. Port Talbot: Neath-Port Talbot County Borough Council.

¹⁴ Neath-Port Talbot County Borough Council, 2016. *Adopted LDP (2011-2026)*. Port Talbot: Neath-Port Talbot County Borough Council.

2.5.2 SHORELINE MANAGEMENT PLAN

The site falls within Policy Unit 8.6 (Neath Estuary) of the Lavernock Point to St Ann's Head Shoreline Management Plan 2¹⁵. The policy for this unit is noted as "hold the line" across all epochs. However, it is noted that this policy is not a guarantee of funding for construction of future, or maintenance of existing, coastal flooding or erosion defences.

¹⁵ Halcrow, 2012. *Lavernock Point to St. Ann's Head Shoreline Management Plan 2*. Barry: Swansea and Carmarthen Bay Coastal Engineering Group.

3 REQUIREMENTS OF TECHNICAL ADVICE NOTE 15

This report assesses the suitability of the proposed development against the requirements of Technical Advice Note 15. This section outlines the risks identified in the report and explains the steps required for the development to comply with current legislation.

According to the Development Advice Map and TAN15, the site is located within Development Advice Map Zone B, and the development is classed as 'Highly Vulnerable' with various elements considered to be 'Less Vulnerable'. According to section 6 of TAN15, both Highly Vulnerable and Less Vulnerable development may be acceptable within Zone B.

With reference to the DAM and acceptability under TAN15, the proposed development may be considered acceptable.

As parts of the site lie within areas considered to be at risk of flooding, the development should seek to incorporate flood resilience into the design where appropriate. Advice concerning the most suitable options has been provided in Section 4.

3.1 FLUVIAL FLOOD RISK

The site lies to the east of the Afon Nedd, in proximity to its estuary at Swansea Bay. The site is not reported to be at flood risk from the Afon Nedd. The extent of NRW's Flood Risk from Rivers dataset indicates waters to be largely contained within the river channel at locations near the site, including at the end of the extent available, located at the Briton Ferry M4 bridge over the Afon Nedd.

Further consideration of fluvial flood risk from the Flood Map for Planning (Figure 2-5), which includes allowances for climate change, illustrates increased risk of flooding, but waters are also shown to be largely contained within the river channel at the Briton Ferry M4 bridge over the Afon Nedd.

3.2 TIDAL FLOOD RISK

Based on NRW's Flood Risk mapping, the site is considered to have a low risk of flooding in the present day, but it is understood that it may be at an increased level of risk in the future due to the effects of climate change.

Analysis of extreme sea levels indicates a design event (70th cc percentile, 0.5%AEP) level of 7.52mAOD, and an extreme event (0.1%AEP) of 7.78mAOD by 2120. Ground levels within the site vary from 7.27mAOD to 7.96mAOD, indicating approximate maximum external depths of 250mm in the design event, and 480mm in the extreme event.

The static caravan is to be set at the east of the site, which has higher ground levels, in the region of 7.8-8.0mAOD. As such, it is recommended that the proposed static caravan should be set with a minimum underside level of 8.3mAOD, which will allow for approximately 780mm of freeboard to prevent flotation of the caravan in the design event. It is however recommended that the caravan be suitably secured to minimise risk of flotation during extreme flood events. Whilst only shallow flooding is predicted, the site itself should ideally be dry in the design event and ground levels raised to 7.52mAOD, minimum. The proposed minimum underside of 8.3mAOD also provides a freeboard of 520mm in the extreme event (0.1%AEP, 70th cc percentile) and 140mm freeboard in the upper extreme event (0.1%AEP, 95th cc percentile).

The proposed day room is also considered highly vulnerable, and as such, it is proposed that it should be set at a minimum floor level of 7.6mAOD, which would mean it remains dry in the design event and flood depths of 200mm are predicted in the extreme event (0.1%AEP, 70th cc percentile) and less than 600 mm in the upper extreme event (0.1%AEP, 95th cc percentile).

It is also recommended that resistance and resilience measures be considered for incorporation into the development, as appropriate, up to 8.2mAOD; however, these should be limited to a maximum of 600mm above the building floor levels, in line with current guidance.

Given the distance of the site from the coast, the site is not anticipated to be at any significant risk of flooding from direct overtopping of the nearby coastal frontage (greenwater or whitewater). Furthermore, as the Shoreline Management Policy is to hold the line across all epochs, it is not anticipated that the degree of flood risk from this action due to changes in erosion patterns will increase over the development lifespan.

3.3 PLUVIAL, SURFACE WATER & MINOR WATERCOURSE RISK

As identified in Section 2.1, the site is adjacent to a number of areas of considered to be at risk of surface water flooding. Such areas are representative of low-lying areas, where surface water could collect following an extreme rainfall event. Given the topography of the site and the surrounding area, the design of a suitable land and surface water drainage system will serve to manage surface water flooding within the developed site. The drainage strategy and site levels will also need to be designed to route any exceedance flows away from more vulnerable parts of the site, and ideally back into the proposed drainage system.

Given the identified pluvial flood risk along the public highway in proximity to the site, road access into the site may be affected by pluvial floodwaters.

Flood depths and velocities reported around the site in NRW's National Flood Hazard Maps have been reviewed for the 'Low Risk from Surface Water' dataset. Details are reproduced in Table 3-1 to inform the assessment of risk posed by surface water at relevant locations, in particular at locations where flooding may affect access to the site.

Table 3-1: Details from NRW's Flood Risk from Surface Water Mapping (Low Risk)

Location	Maximum Depth (mm)	Maximum Velocity (m/s)	Flood Hazard
Church Street Underpass (West)	1432	0.55	Significant
Church Street Underpass (East)	640	1.14	Significant
Wharf Street	203	0.14	Low
Villiers Street	352	0.14	Moderate

It is noted that as the NRW pluvial model does not typically take into account any local drainage systems it may overestimate the risk and water levels associated with pluvial flooding.

3.4 ACCESS, EGRESS AND EVACUATION

3.4.1 SURFACE WATER

Access and egress may be affected by surface water flooding at a number of locations. A number of access routes are present, but NRW's risk mapping indicates that the most suitable route is via Wharf Road and Brunel Way, and that other routes are higher risk and may not be suitable.

Examination of surface water flooding in NRW's low risk from surface water mapping, given in Table 3-1, indicates that emergency access is likely to remain feasible via Wharf Road if flooding occurs associated with surface water; however as the site is predicted to remain dry in a surface water flood event and as these effected areas tend to be isolated pockets, likely of a short duration, a policy of safe refuge during a pluvial event, may be more prudent.

3.4.2 TIDAL

NRW's tidal mapping illustrates large areas around the site may be inundated by tidal flood waters in the extreme event. Furthermore, review of ground levels (LiDAR) with estimated extreme sea levels along the access routes indicates that depths of flooding are likely to limit access to the site in a tidal flooding event. However, as tidal flooding is typically predictable, an evacuation of the site is feasible. Where this is not possible, for example in a no-notice flood event, it is recommended that occupiers take safe refuge within the static caravan.

Table 3-2: Estimated Tidal Flood Depths (70th cc Percentile)

Location	Minimum Ground Level (mAOD)	Estimated Maximum Depth (m)		
		0.5% cc (2120)	0.1% (2017)	0.1% cc (2120)
Church Street Underpass (West)	4.1	3.4	1.6	3.7
Church Street Underpass (East)	5.3	2.2	1.4	2.5
Wharf Street	5.8	1.7	0.9	2.0

3.5 FLOOD COMPENSATION

Raising ground levels within areas at risk of flooding can displace flood water, which can have a negative effect on the flood risk of third parties, which is not typically permissible. Tidal flooding, however, tends to reach a level and is less susceptible to displacement that requires compensation than fluvial floodwaters.

Given the tidal nature of the flood risk at the site, and the small size of the plot, the localised raising of ground levels is likely to have a negligible effect on predicted stage levels, and therefore it is considered that flood compensation is not required.

3.6 GROUNDWATER FLOOD RISK

The site is not within a groundwater source protection zone. According to the British Geological Survey 50k mapping, site is lies on pennant sandstones forming part of the Rhondda member, overlaid with superficial tidal flat deposits comprised of mud and sand.

The SFCA identifies that: *“Overall groundwater is not believed to be a major source of flooding”*.

The groundwater table would be anticipated to be dominated locally by the Afon Nedd and Swansea Bay tidal levels. The proposed development does not include any basements, sub-levels or undercrofts, and therefore, the risk of groundwater flooding may be considered minimal. Generally, the emergence of groundwater is slow, and it is thought that there should be sufficient time for counter measures against groundwater ingress to be implemented if required.

These conclusions should, however, be revisited should any ground investigation works undertaken as part of the design process contradict them, or identify any particular concerns with the water table, and additional mitigation included if necessary.

3.7 SURFACE WATER DRAINAGE

Despite the current site being developed, the proposed development could potentially increase surface water runoff. Once any proposed drainage arrangements are accepted by the LLFA and SAB, flood risk from this source of flood risk may be considered as residual.

3.8 AWARENESS OF FLOOD RISK

It is recommended that occupiers of the site are made aware of flood risk at and around the site itself, as well as in the wider Briton Ferry area. It is recommended that a Flood Action Plan should be developed for the site.

It is recommended that occupiers of the site sign up for NRW Warnings and Alerts.

3.9 RESERVOIR AND INFRASTRUCTURE FLOOD RISK

The site is not shown as within a risk area associated with modelled reservoir failures on NRW's mapping. It is noted that the Cefn-Cwrt and historic Briton Ferry reservoirs are not included in the mapping at the time of writing, and as such, the specific degree of risk associated with these features is not fully understood. Examination of ground levels (LiDAR) indicates that these features lie within the same catchment and upstream of the site by circa 2.5km and 1.6km respectively following the flowpaths, and so in the event of a breach, flood waters could potentially reach the site. However, unless there are known concerns with these features it is not considered that this residual risk should forestall development. A small pond feature is located to the south-east of the site, however,

examination of ground levels indicates a probable flow path from this feature towards the docks area, and as such, it is not considered that this water body poses any significant flood risk to the site.

The Jersey Canal is also located in proximity to the site, however, examination of ground levels indicates that this lies at a level below the site, and as such is not considered to pose a significant risk to the site.

As such, unless there are any known issues with these reservoirs and other water bodies, it is considered that the level of flood risk at the site associated with these water bodies is acceptable.

Having considered the flood risk from lakes, canals and reservoirs, two principal infrastructure sources remain: a burst water main and the foul drainage network. A burst water main, even accounting for DCWW's asset, would likely have a similar effect as a sizable rainfall event to which the site is not considered particularly vulnerable (Section 3.3), similarly, a surcharging foul (or combined) sewer would likely follow a similar flowpath. Unless there are known issues with this asset its presence should not forestall development nor require any additional mitigative measures from a flood perspective.

Once the foul drainage strategy and any proposed additional flow into the public sewer has been agreed with the water and sewerage undertaker(s), the risk of flooding from this source can be considered as residual.

3.10 COMPLIANCE WITH TAN15

Whilst the site is a residential site and thus technically Highly Vulnerable, the proposed development seeks to set more vulnerable elements at higher levels within the site, and it is noted the static caravan itself is to be set at a level above the adjacent ground level. Whilst the development is classed as highly vulnerable, the proposals also include various elements considered to be less vulnerable, such as a storage shed and kennels.

3.10.1 ACCEPTABILITY OF CONSEQUENCES

Section 7 of TAN15 outlines the acceptability of consequences:

3.10.1.1 TAN15 Section 7.2

Under Section 7.2 of TAN15 the three key criteria of acceptability are whether:

- The consequence of flooding can be managed down to an acceptable level including its effects on existing development,
- Safe access can be achieved, and
- Timely flood warnings can be provided.

The consequences of flooding can be made acceptable, provided a site layout in line with that set out in this report, and with the mitigation identified, will meet the guidance of TAN15 as discussed throughout Section 3.10 of this report. Consideration of access has been undertaken for various events as set out in Section 3.4, and it is a matter for the Local Authority whether the access arrangements, or safe refuge measures, are acceptable. It is anticipated that flood alerts and warnings should be available from NRW. The recommendations set out within this report will assist in meeting the intent of these three criteria.

3.10.1.2 TAN15 Section 7.3

Section 7.3 of TAN15 notes that if a development is justified, mitigation measures should be incorporated into the design to make it as safe as possible (Section 4) and that there is:

- Minimal risk to life;
Risk to life may be minimised by incorporating flood resilience and resistance measures into the design, as well as provision of safe refuge areas.
- Minimal disruption to people living and working in the area;
Disruption to people living and working in the area may be minimised by reducing the extents and depths of flooding on site, by including flood resilience and resistance measures.
- Minimal potential damage to property;
Potential damage to property may be minimised by incorporating flood resilience and resistance measures into the design, by reducing the extents and depths of flooding on site.
- Minimal impact of the proposed development on flood risk generally, and;
The site proposals include adjustments to ground levels within the flood plain, however, this is only within the tidal flood plain, as such are unlikely to have any significant impact of general flood risk.
- Minimal disruption to natural heritage.
Disruption to natural heritage can be minimised by making space for water, by reducing the extents and depths of flooding on site, by including flood resilience and resistance measures, and by developing a flood action plan.

This report provides sufficient information to judge whether or not if above criteria are met.

3.10.1.3 TAN15 Section 9

The site includes extents of DAM Zone B. TAN15 states that both Highly and Less Vulnerable developments may be acceptable within DAM B.

Consideration of the acceptability criteria laid out in Section 9 of TAN15 is made below.

Acceptable Consequences for Nature of Use

This FCA considers that the level of flood risk is low from most sources, with an elevated degree of tidal risk in the existing condition. With consideration of the recommendations of this report, it is considered that the proposed development and development vulnerability may be considered to be commensurate with the anticipated level of flood risk from the various flood maps and information available.

Occupiers Aware of Flood Risk

It is recommended within this report that a flood action plan is developed for the site. This document should be reviewed, practised, and revised on a regular basis; hence ensuring an appropriate awareness of flood risk.

Escape or Evacuation Routes Present

Access and egress considerations have been provided in Section 3.4. This highlights the need to consider potential impediments on the normal access routes to the site. Emergency access and egress may not remain feasible during tidal flooding events, and it is recommended that a policy of safe refuge be adopted in such events.

Effective Flood Warnings Provided

It is understood that flood alerts and warnings from NRW are currently available at the site's stated postcode. Therefore, it is recommended that persons occupying the site should sign up to receive these flood alerts and warnings.

In order to enable flood warning measures which can be taken when risk is present or anticipated, appropriate measures or systems should be developed to ensure all users of the site are, and can be, made aware of flood risk and flood events when they occur. These measures should be documented in a Flood Action Plan.

Flood Emergency Plans and Procedures

This report recommends that a Flood Action Plan should be practised, reviewed and developed by the site occupiers on a regular basis.

Flood Resistant Design

This report makes recommendations as to how flood resistant measures may be incorporated into the design of the development as appropriate.

No Increase in Flooding Elsewhere

Tidal flood levels tend to reach a set level, and as such, it is not anticipated any ground level changes associated with the proposed development will cause an increase in flood risk elsewhere.

3.10.2 TAN15 UPDATE

An updated TAN15 is due to be enacted from June 2023 alongside the Flood Map for Planning (Figure 2-5 and Figure 2-6). It is understood that vulnerability classes for developments remain similar, but with some small differences. The acceptability of developments within flood zones are likely to become stricter, with all development directed away from areas considered at risk in the 1%CC fluvial or 0.5%CC tidal AEP events (i.e. outside Flood Zones 2 and 3).

Currently, the site is predominantly classified as including areas of Flood Zones 2 and 3. These maps will be updated regularly by NRW and will use the latest climate change allowances including sea level rise and so flood zone limits may change in future iterations of the map.

4 RECOMMENDATIONS

The recommendations of this document are made to the client in their development of this site.

- The development should set the underside of the static caravan above the predicted design water level, which is estimated to be 7.5mAOD, and it is recommended that a minimum level of 8.3mAOD be incorporated for the underside of the caravan, and it be ensured that the development incorporate flood resilience, flood resistance, or both.
 - Additionally, the static caravan should be suitably securable to minimise flotation risk.
- The development should set the proposed day room at a minimum level of 7.6mAOD, and ensure it incorporates flood resilience, flood resistance, or both.
 - Water exclusion measures should be considered, as appropriate, up to 8.2mAOD, minimum; however, these should be limited to a maximum of 600mm above the various building levels, in line with current guidance¹⁶.
- General ground levels within the development should be raised to a minimum level of 7.52mAOD.
- A site-specific Flood Action Plan should be developed. This should include:
 - Consideration of a no-notice flood event. The static caravan is recommended to be set above the predicted extreme event flood level, and as such, use of this as a designated refuge areas should be considered.
 - Occupiers of the site should sign up to flood warnings and alerts from NRW.
 - Pre-event actions to prepare for an event.
 - Post-event inspections and maintenance.
- Mitigation measures to improve the flood resilience and defence of the proposed development should be incorporated into the design where practicable; reference should be made to CIRIA's Code of Practice for Property Flood Resilience (C790)¹⁷; some measures that should be considered for inclusion are:
 - Flood-proof doors and /or inbuilt demountable defence attachment/anchor points;
 - Incorporation of a raised thresholds into the design;
 - Sealable ventilation;
 - Non-return valves fitted to drains and water inlet/outlet pipes as appropriate;
 - Walls to be dry-lined using lime-based plaster and draining cavities as appropriate;
 - Sensitive equipment kept at an elevated level;
 - The potential inclusion of a designated safe refuge area to which site occupiers can retire to in the event of a no-notice flood event;
 - Ground floors to be hard-floored, and;
 - Ground floors to include raised electrical sockets.
- The proposal, as reviewed, is not anticipated to significantly increase surface water runoff for the reasons outlined within the report. The surface water drainage strategy will be assessed by the

¹⁶ Bowker P, 2007. *Improving the Flood Performance of New Buildings: Flood Resilient Construction*. London: DEFRA.

¹⁷ Kelly D, et al, 2020. *Code of Practice for Property Flood Resistance*. London: CIRIA.

LLFA and SAB, with the aim of ensuring there is no significant increase in surface water runoff and the risks of flooding due to localised runoff or exceedance flowpaths are minimised.

- The foul water strategy will be developed to the satisfaction of DCWW and will ensure that there is no undue risk of flooding from this source. Sealed manholes should be considered where chambers lie within the flood risk areas in order to mitigate ingress of flood waters into the system.
- It is recommended that basements or sub-levels are neither incorporated into the design nor added at a later date and that the site is not used for emergency services, waste disposal, for storing of processing hazardous materials or for other more vulnerable uses even on a temporary basis without an approved FCA specifically considering such changes.

Many of these recommendations are for consideration rather than strict requirements necessary for the site to be compliant, and suitable care and consideration should be taken in their application.

5 CONCLUSIONS

The proposed development includes development elements classed as Highly Vulnerable and Less Vulnerable. Highly and less vulnerable development may be permissible in DAM Zone B.

The development proposal has located more vulnerable elements on higher ground, and the proposed development is considered to include development classes and types that are commensurate to the degree of flood risk present at the site.

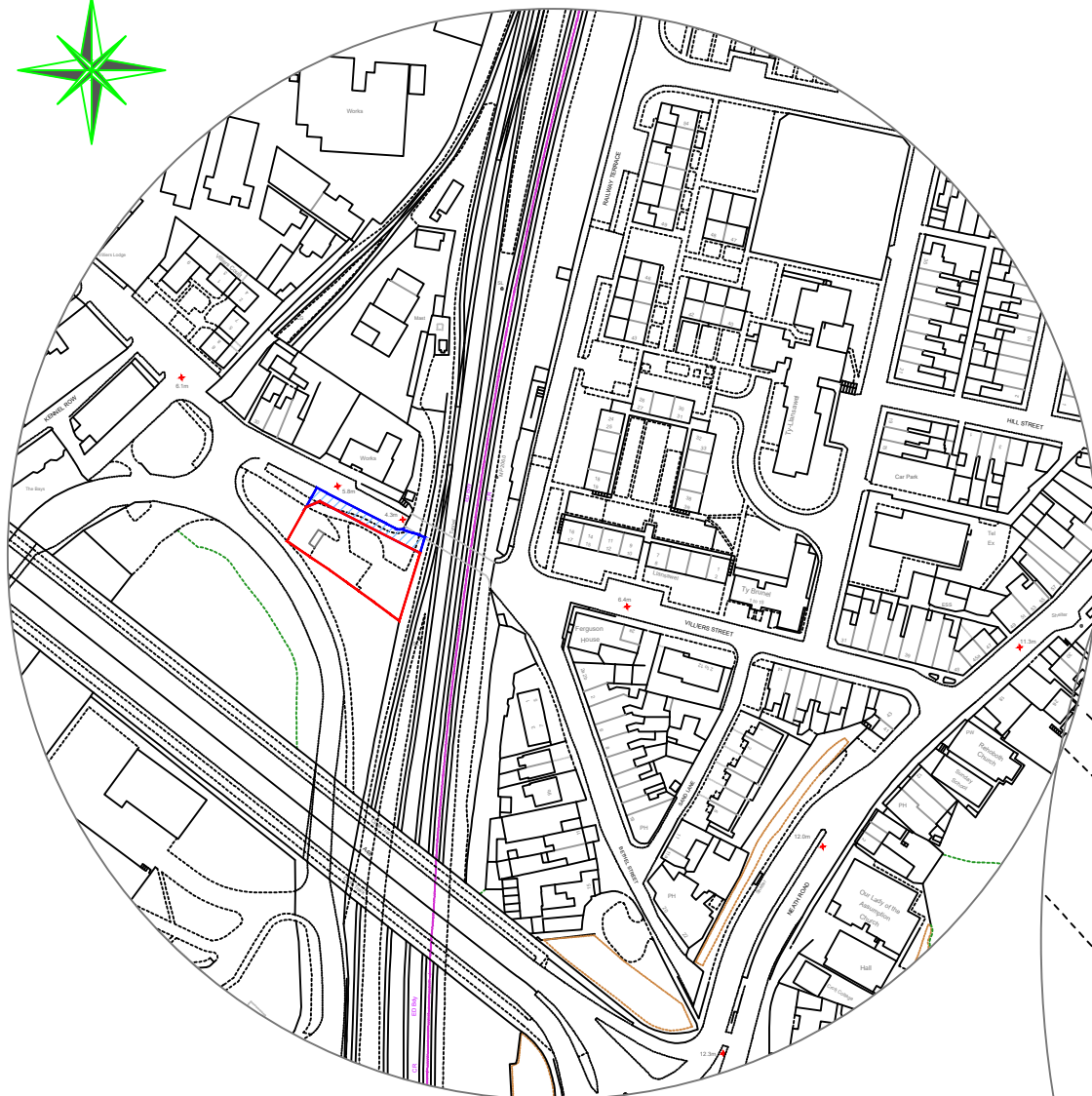
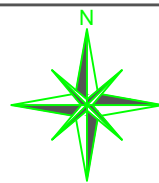
The recommendations given within this report have been made as a precautionary approach to mitigating flood risk, and to allow for any uncertainty in the flooding extents and levels which have been considered.

It is concluded in this report that, provided the mitigative measures are given suitable consideration, then the level of risk may be considered satisfactory and are arguably commensurate with the proposed development.

Appendix A

PROPOSED DEVELOPMENT





Location Plan
Scale 1:2500

Notes

Site area for static caravan, touring caravan and day room = 870 sqm (0.0870ha)

Proposed day room gross internal area = 50 sqm

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Creation of Traveller Pitch to Include Day Room, Static Caravan and Touring Caravan (Partly in Retrospect)
No. 1 Ponderosa, Church Street
Briton Ferry, Port Talbot
SA11 2HZ

Designed by

Checked by

File name

AVH_933

Date

10.10.2022

Scale

A3 @ As Shown

Client

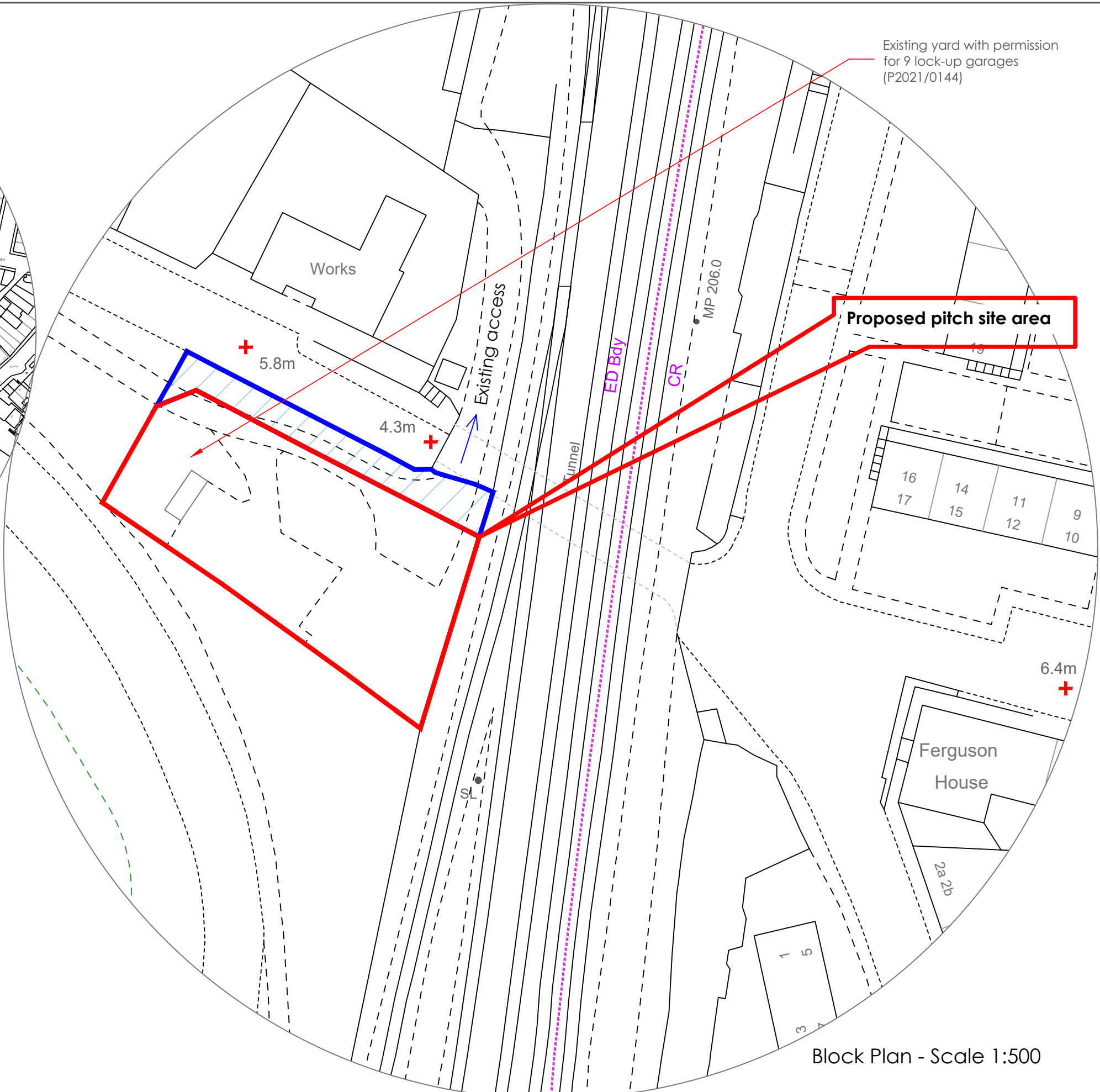
Mr & Mrs Tom Roberts & Family

Drawing Title

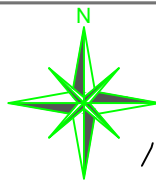
Location and Block Plans

Dwg No.

01a



Block Plan - Scale 1:500



Works



5.8m



4.3m

Tunnel

ED Bdy

Note

Spot heights related to OS Bench Mark on
Bethesda Chapel, Villiers Street - 6.730m AOD



Hayston
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**Creation of Traveller Pitch to Include Day Room, Static Caravan
and Touring Caravan (Partly in Retrospect)
No. 1 Ponderosa, Church Street
Briton Ferry, Port Talbot
SA11 2HZ**

Designed by

Checked by

File name

AVH_933

Date

13.02.2023

Scale

A3 @ 1:250

Client

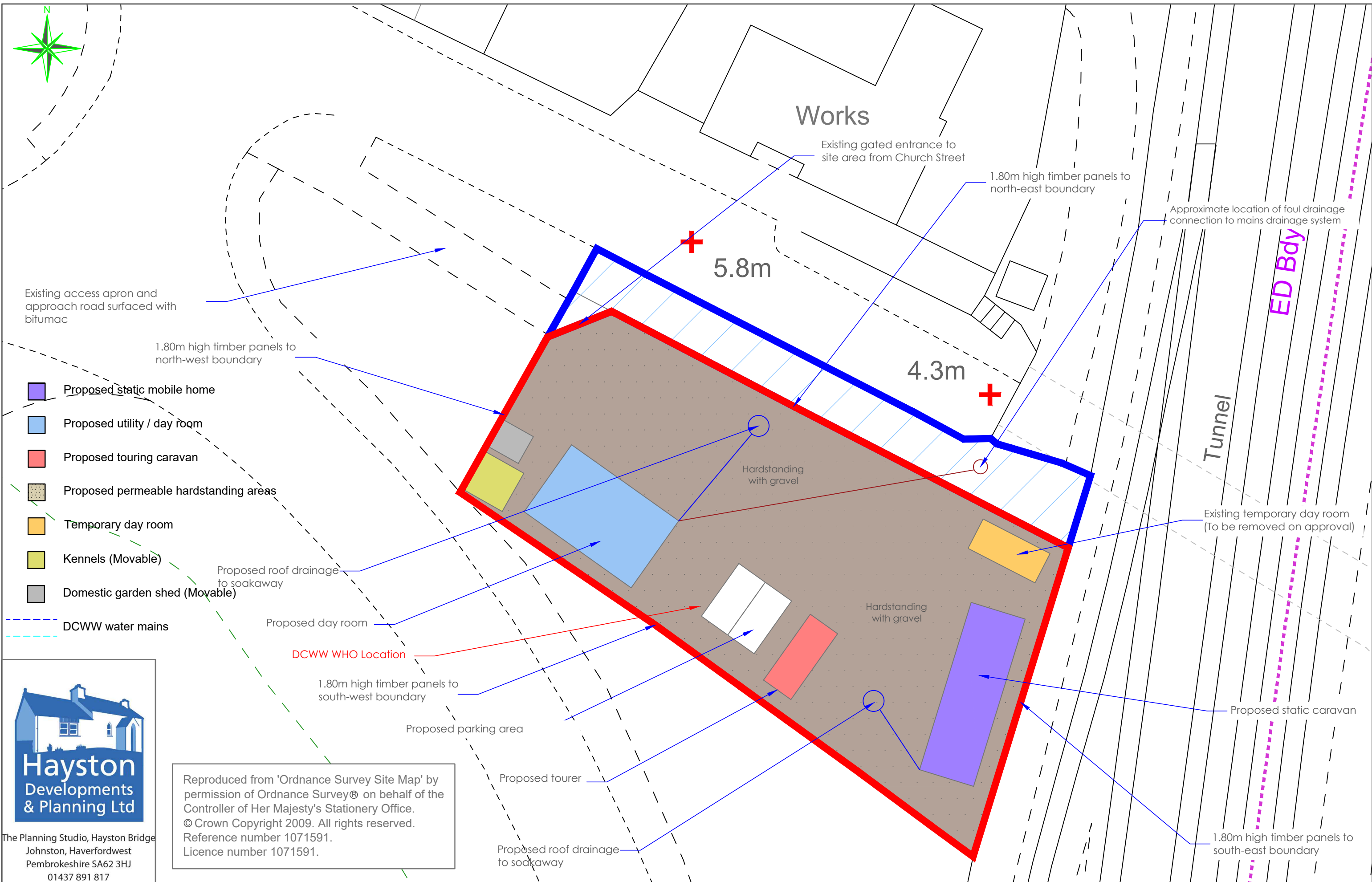
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Drawing Title

Site Plan Showing Current Levels

Dwg No.

07



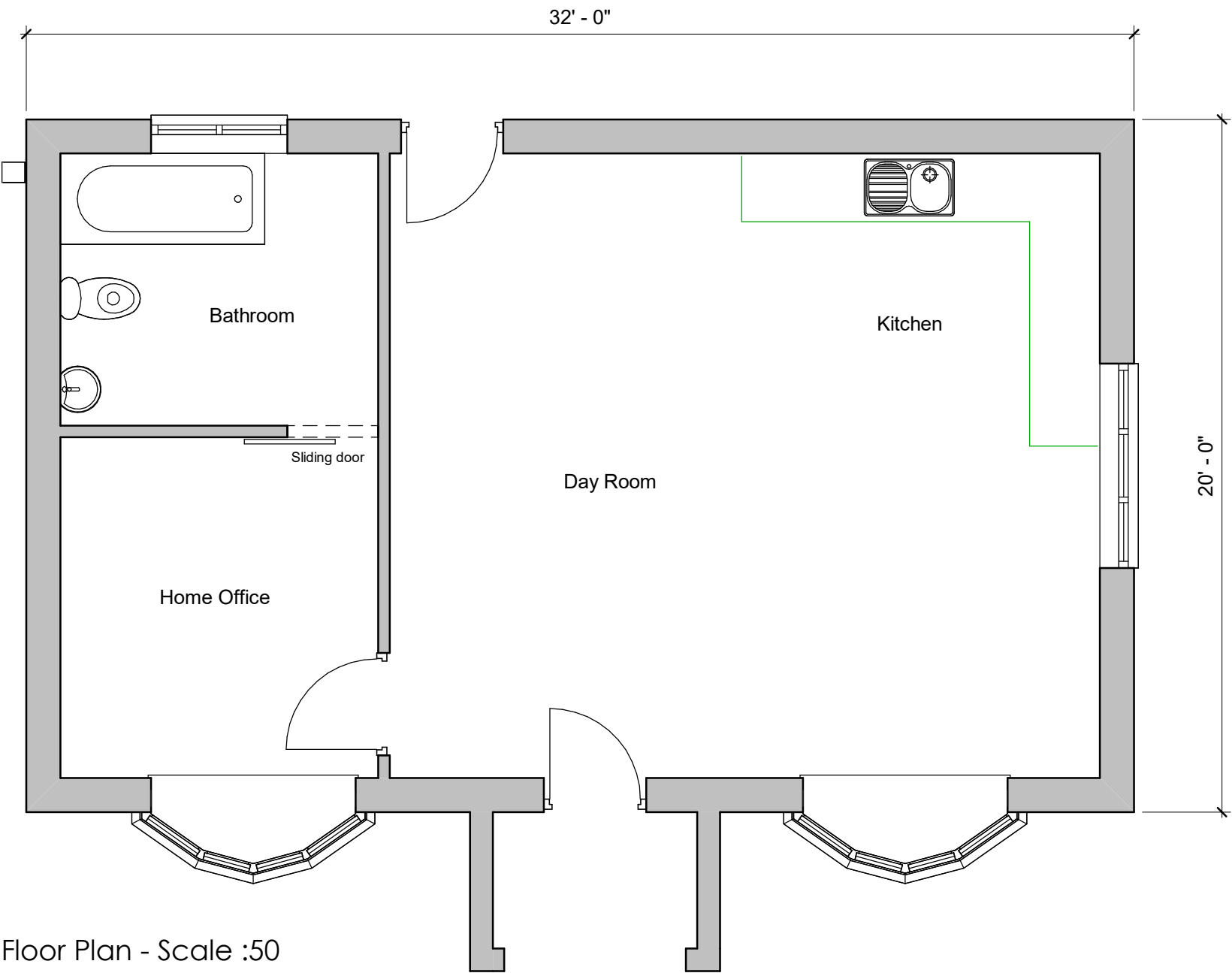
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No. 1 Ponderosa, Church Street
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Client	Mr & Mrs Tom Roberts & Family
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Dwg No. **02d**

Client
Mr & Mrs Tom Roberts & Family

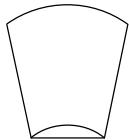


Floor Plan - Scale :50



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EXTERNAL FINISHES		
1.	Roof Covering	Blue/black natural slate
2.	Walls	Smooth render - painted
3.	Rain Water Goods	Black uPVC Half Round Guttering with Circular Downpipes
4.	Doors / Windows	Profiled uPVC - Grey in colour



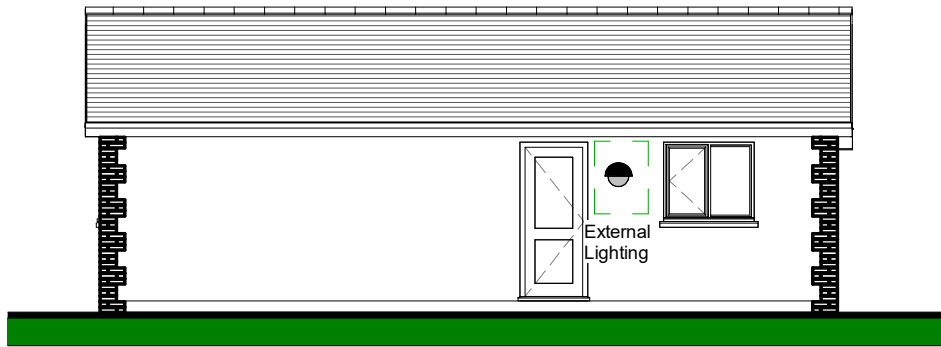
Beaumaris midi
bat boxes



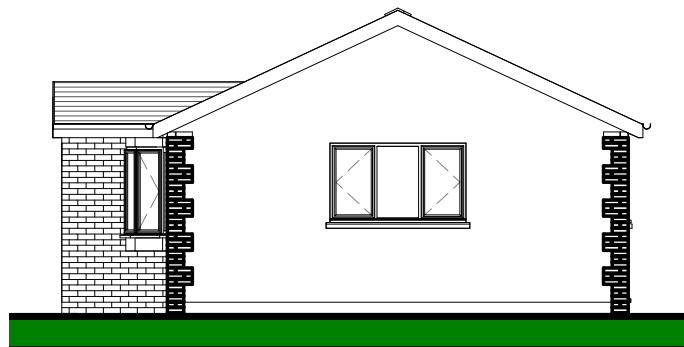
Bird box



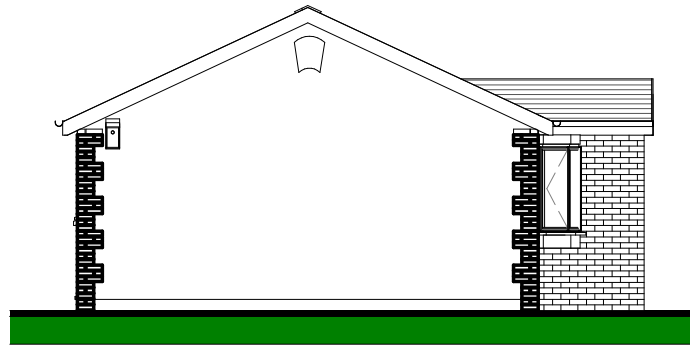
South Elevation - Scale 1:100



North Elevation - Scale 1:100



East Elevation - Scale 1:100



West Elevation - Scale 1:100

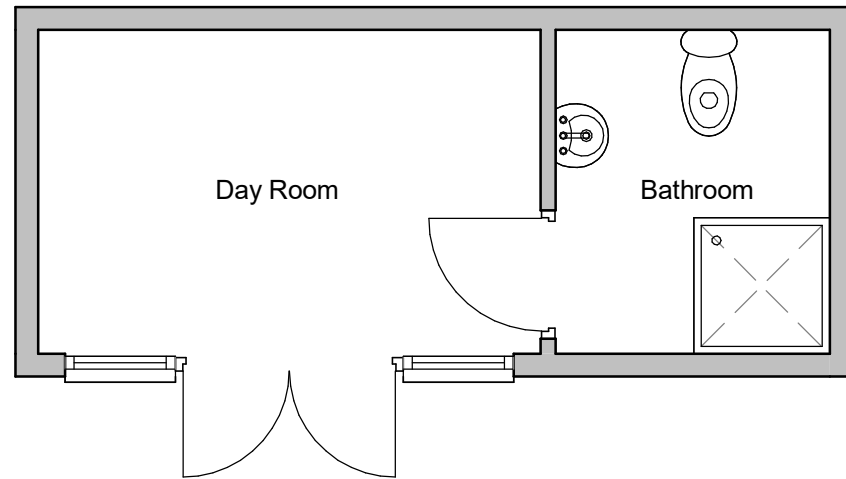
Creation of Traveller Pitch to Include Day Room, Static
Caravan and Touring Caravan (Partly in Retrospect)
No. 1 Ponderosa, Church Street
Briton Ferry, Port Talbot
SA11 2HZ
(for Mr & Mrs Tom Roberts & Family)

Utility/Day Room

Project number	AVH_933
Date	10.10.2022
Drawn by	'
Checked by	'

04a

Scale As indicated



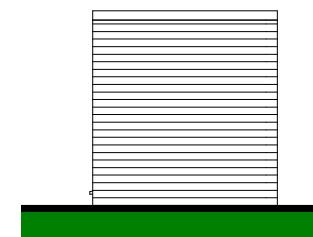
Floor Plan - Scale :50



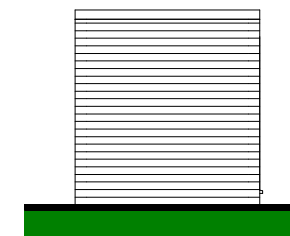
South Elevation - Scale 1:100



North Elevation - Scale 1:100



East Elevation - Scale 1:100



West Elevation - Scale 1:100

Client
Mr & Mrs Tom Roberts & Family

EXTERNAL FINISHES

1.	Roof Covering	Converted container - Steel Roof
2.	Walls	Converted container - Grey plastic cladding
3.	Doors / Windows	Profiled metal - grey in colour



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No.	Description	Date

Creation of Traveller Pitch to Include Day Room, Static Caravan and Touring Caravan (Partly in Retrospect)
No. 1 Ponderosa, Church Street
Briton Ferry, Port Talbot
SA11 2HZ
(for Mr & Mrs Tom Roberts & Family)

Existing Temporary Day Room Details

Project number	AVH_933	03a
Date	10.10.2022	
Drawn by	'	
Checked by	'	
Scale	As indicated	

10/10/2022 11:39:14

Appendix B

FLOOD MAP PACK





FLOOD RISK PACK



Client:
Hayston Developments & Planning Ltd

Project Reference:
70106721

Site Reference:
Ponderosa, Briton Ferry

Site Location
273944, 194062

Site Area:
0.09 hectares

Map Scale:
1:5000

CONTENTS

Page 1 - Site Location

Page 2 - Development Advice Map

Page 3 - Flood Map for Planning

Page 4 - Risk of Flooding from Rivers

Page 5 - Risk of Flooding from the Sea

Page 6 - Risk of Flooding from Surface Water

Page 7 - Historic Flood Map

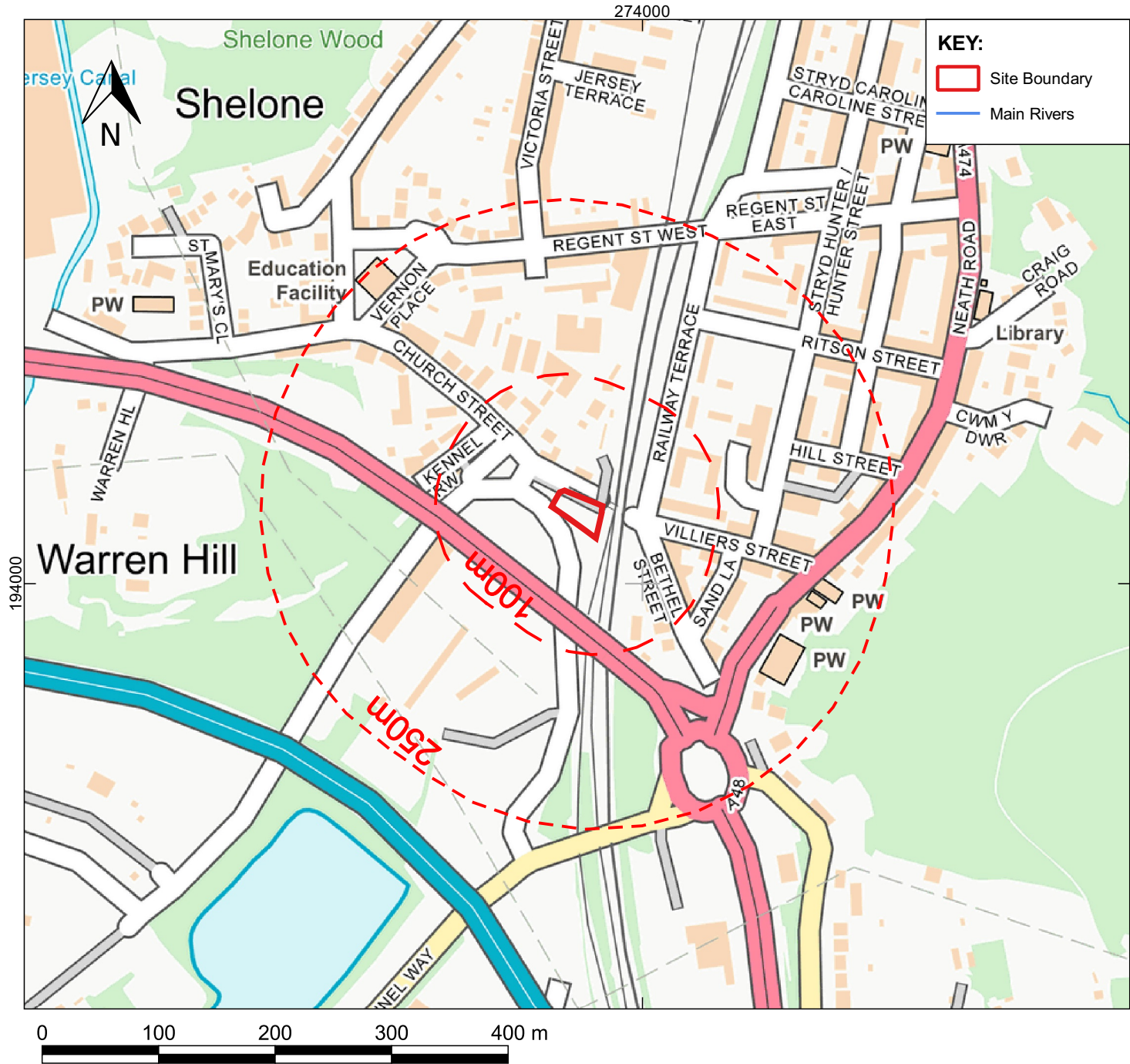
Page 8 - Source Protection Zones

Page 9 - Aquifer Designation

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SITE LOCATION



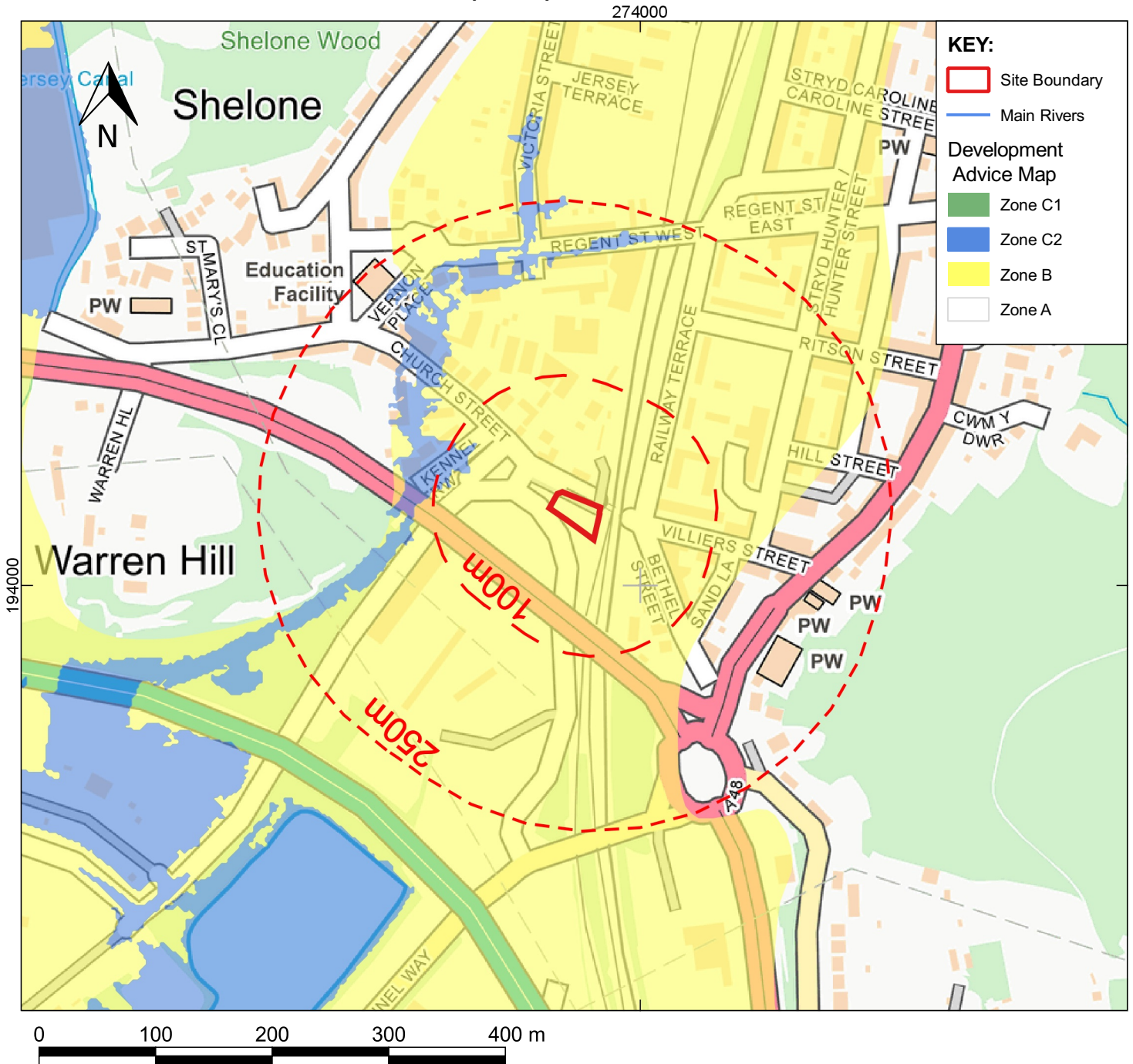
In Wales 'main rivers' are legally designated by Natural Resources Wales, they are typically larger streams and rivers but do include some smaller watercourses. Where works, either temporary or permanent, are proposed: in or near a main river, or in a flood plain or flood defence (including a sea defence), an application for a Flood Risk Activity Permit (FRAP) will usually be required.

All other watercourses in Wales are known as ordinary watercourses and are the responsibility of the Lead Local Flood Authority or Internal Drainage District. Where works, either temporary or permanent, are proposed on or near an ordinary watercourse either an ordinary watercourse consent (LLFA) or land drainage consent (IDD) may be required from the relevant authority.

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NATURAL RESOURCES WALES (NRW) DEVELOPMENT ADVICE MAP



The Development Advice Map (DAM) shows areas at risk of flooding for the purposes of land-use planning. The DAM should be used to guide developments away from flood risk areas. The maps should be considered as a trigger for following policy advice in TAN15.

DAM Zone A is the area considered to be at little or no risk of fluvial or tidal flooding.

DAM Zone B is the area considered as known to have flooded in the past, evidenced by sedimentary deposits. It is based on BGS 10k superficial geology published 2004, revised 2017.

DAM Zone C is updated quarterly and is divided in two, it is based on the extreme flood outline, a 0.1% probability of flooding in any year from rivers or tides.

DAM Zone C1 is considered as areas of the floodplain which are developed and served by significant infrastructure, including defences.

DAM Zone C2 is considered as areas of the floodplain without significant flood defence infrastructure.

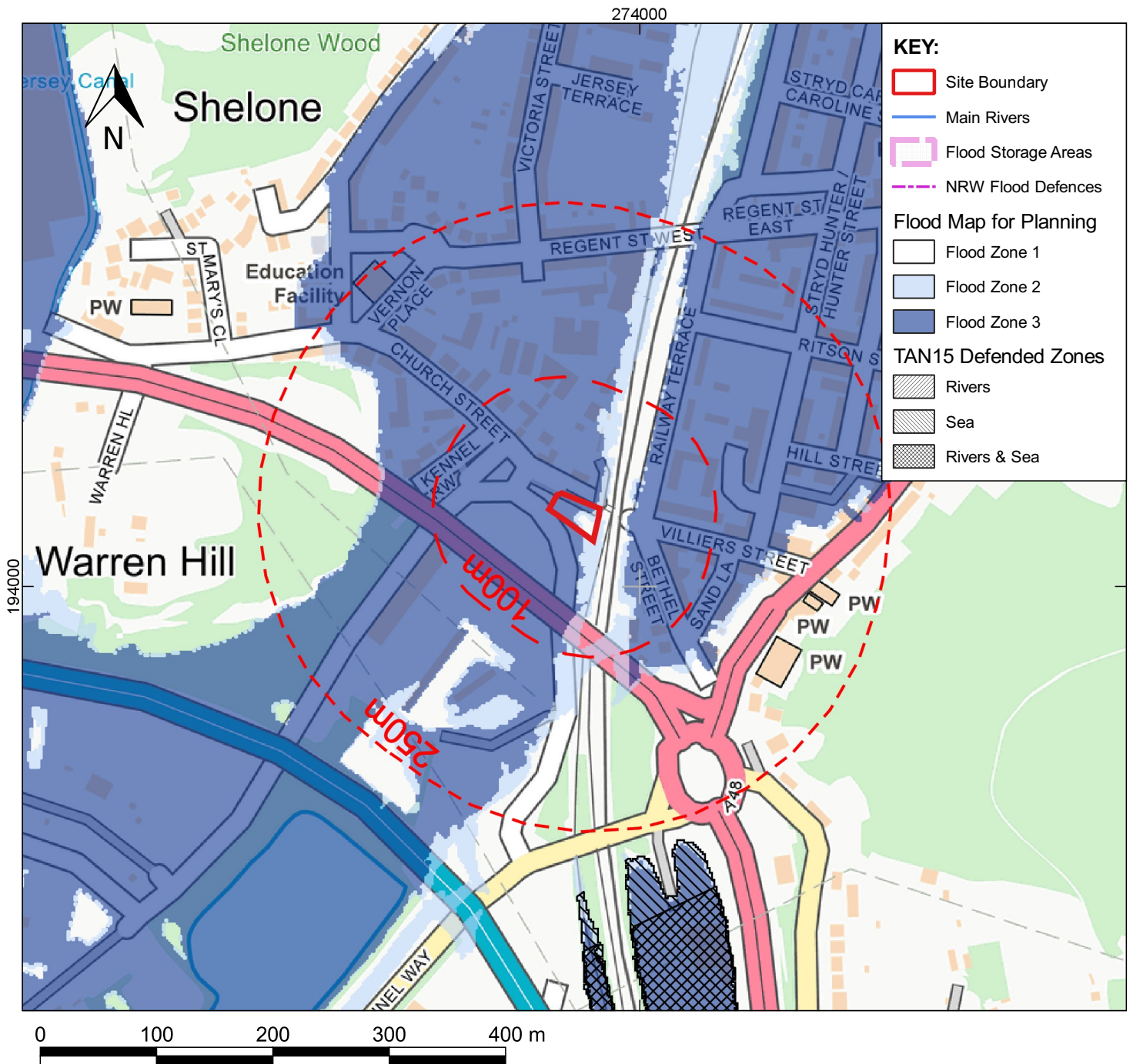
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NRW FLOOD MAP FOR PLANNING



Flood zone maps are modelled using local and national river and sea data. This information provides an indication of the likelihood of flooding and is intended for planning use only.

Flood Zone 1 - Land having a less than 1 in 1,000 annual probability of river or sea flooding. (Shown as 'clear' on the Flood Map – all land outside Zones 2 and 3).

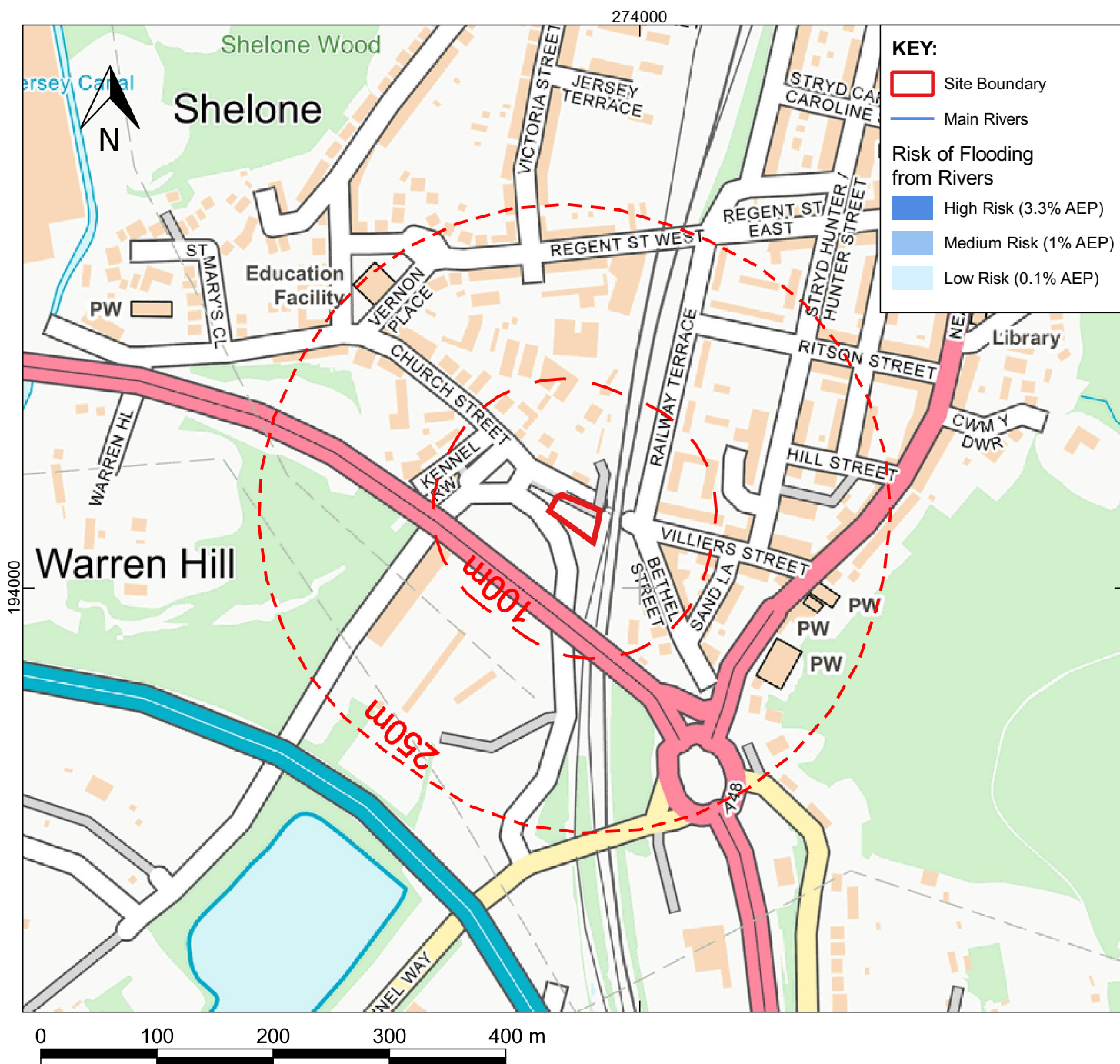
Flood Zone 2 - Land having between a 1 in 100 and 1 in 1,000 annual probability of river flooding; or land having between a 1 in 200 and 1 in 1,000 annual probability of sea flooding. (Land shown in light blue on the Flood Map)

Flood Zone 3 - Land having a 1 in 100 or greater annual probability of river flooding; or Land having a 1 in 200 or greater annual probability of sea flooding. (Land shown in dark blue on the Flood Map)

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NRW RISK OF FLOODING FROM RIVERS



High risk means that each year this area has a chance of flooding of greater than 3.3%.

Medium risk means that each year this area has a chance of flooding of between 1% and 3.3%.

Low risk means that each year this area has a chance of flooding of between 0.1% and 1%.

This takes into account the effect of any flood defences in the area. These defences reduce but do not completely stop the chance of flooding as they can be overtopped, or fail.

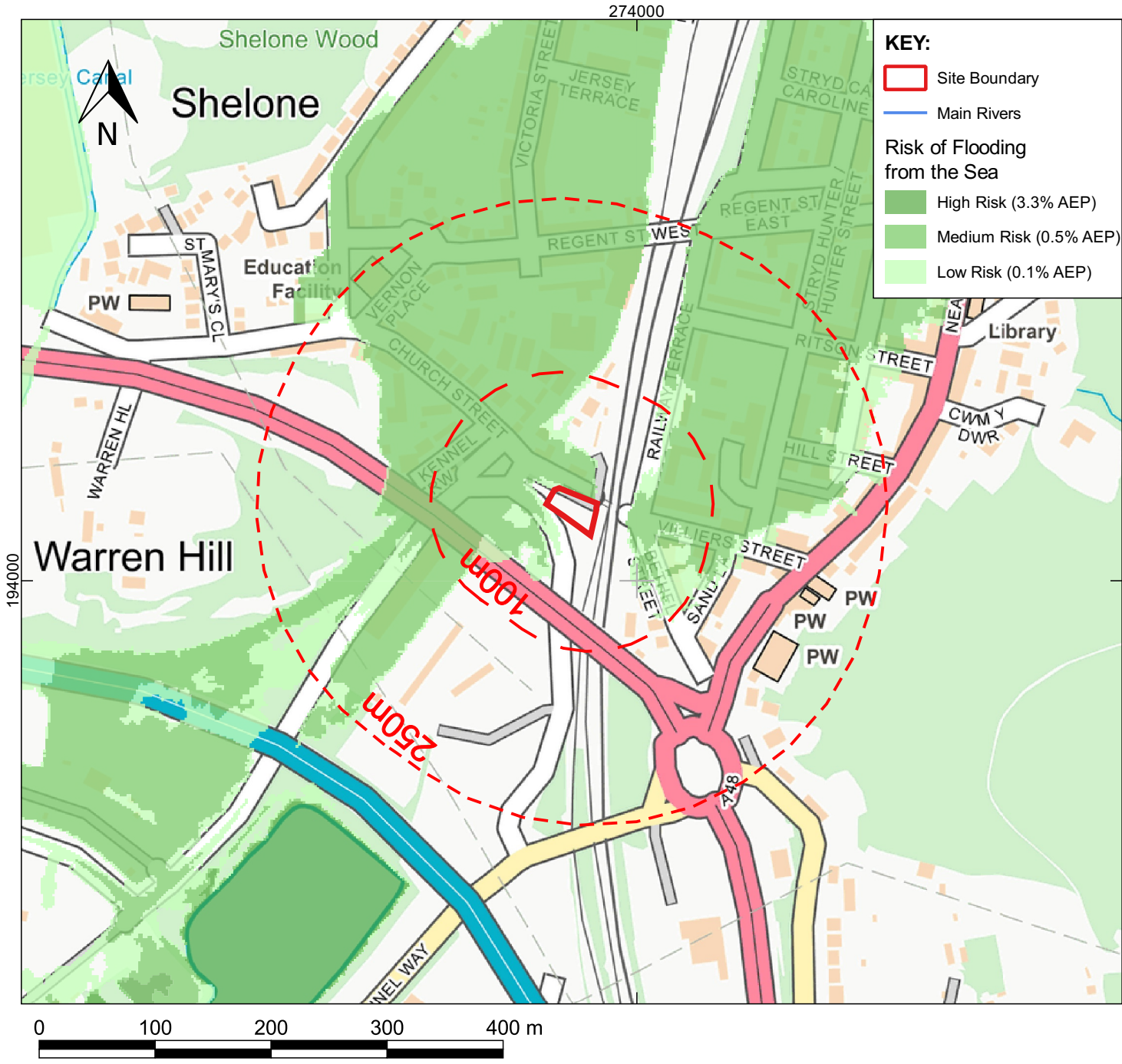
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NRW RISK OF FLOODING FROM THE SEA



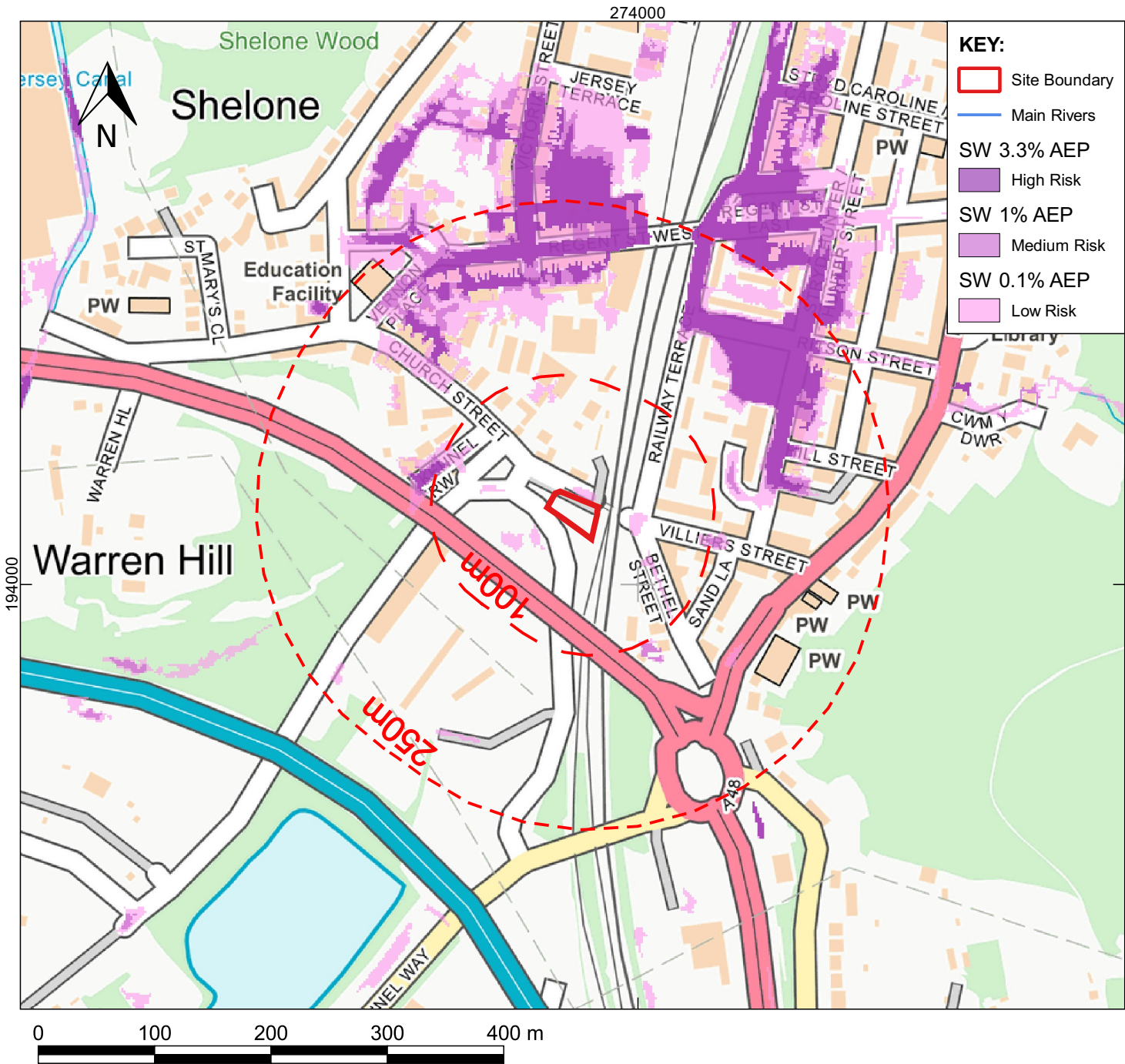
High risk means that each year this area has a chance of flooding of greater than 3.3%.

Medium risk means that each year this area has a chance of flooding of between 0.5% and 3.3%.

Low risk means that each year this area has a chance of flooding of between 0.1% and 0.5%.

This takes into account the effect of any flood defences in the area. These defences reduce but do not completely stop the chance of flooding as they can be overtopped, or fail.

NRW RISK OF FLOODING FROM SURFACE WATER & SMALL WATERCOURSES



High risk means that each year this area has a chance of flooding of greater than 3.3%.

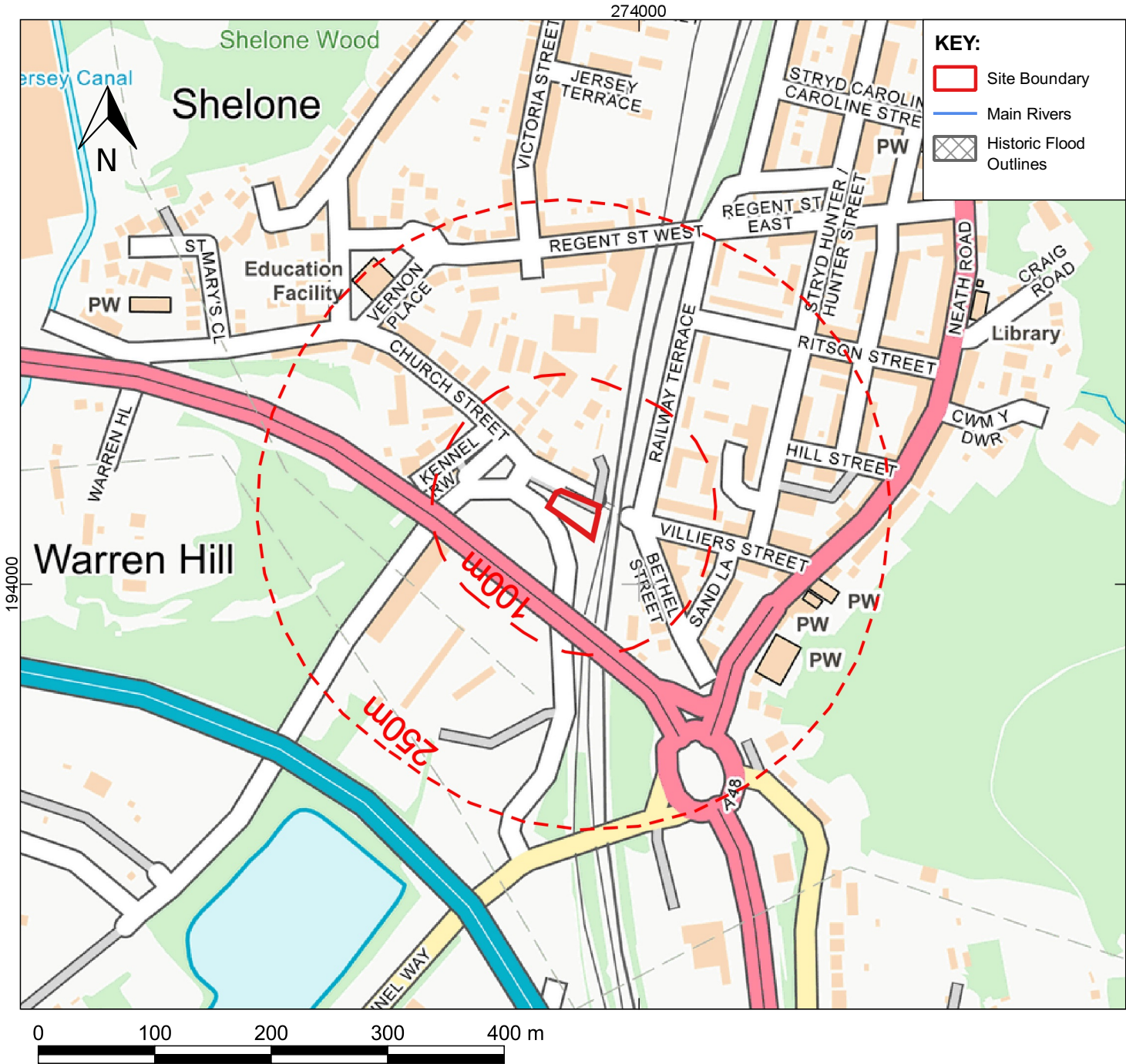
Medium risk means that each year this area has a chance of flooding of between 1% and 3.3%.

Low risk means that each year this area has a chance of flooding of between 0.1% and 1%.

Flooding from surface water is difficult to predict as rainfall location and volume are difficult to forecast. In addition, local features can greatly affect the chance and severity of flooding.

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NRW HISTORIC FLOOD MAP

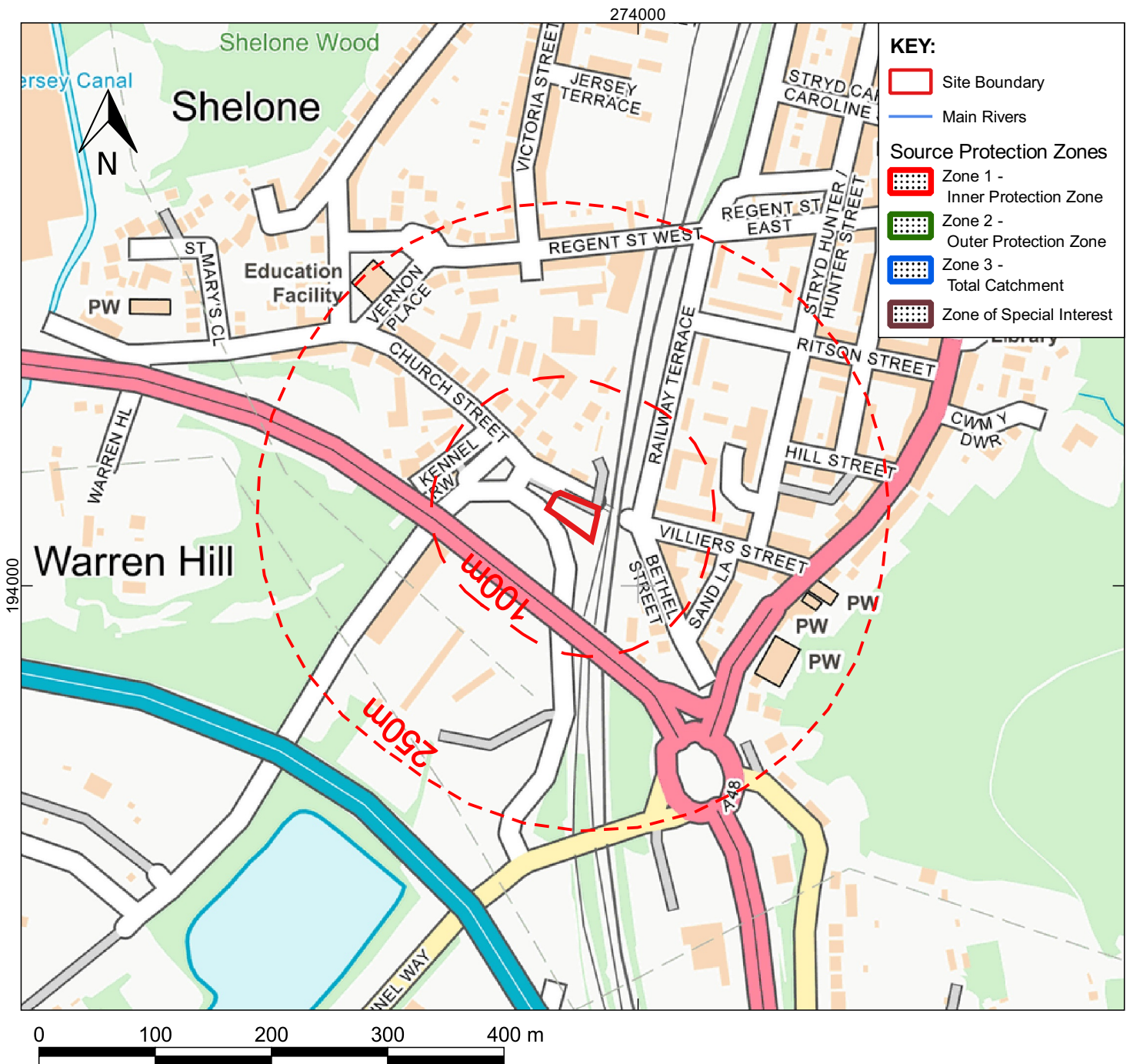


The hatched areas are those that have been recorded to have flooded in the past. The records come from a number of evidence sources including Natural Resources Wales, its predecessors or other Risk Management Authorities. They may show flooding from rivers, the sea or surface water. Where they show flooding from rivers or the sea, and deemed of an appropriate quality they form part of Flood Zone 2.

The absence of coverage by the Historic Flood Map for an area does not mean that the area has never flooded, only that we do not currently have records of flooding in this area. It is also possible that the pattern of flooding in this area has changed and that this area would now flood under different circumstances. The Historic Flood Map will take into account of the presence of defences, structures, and other infrastructure where they existed at the time of flooding. It will include flood extents that may have been affected by overtopping, breaches or blockages. Flooding shown to the land and does not necessarily indicate that properties were flooded internally.

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NRW SOURCE PROTECTION ZONES



Inner zone (Zone 1) - Defined as the 50 day travel time from any point below the water table to the source. This zone has a minimum radius of 50 metres;

Outer zone (Zone 2) - Defined by a 400 day travel time from a point below the water table. The previous methodology gave an option to define SPZ2 as the minimum recharge area required to support 25 per cent of the protected yield. This option is no longer available in defining new SPZs and instead this zone has a minimum radius of 250 or 500 metres around the source, depending on the size of the abstraction;

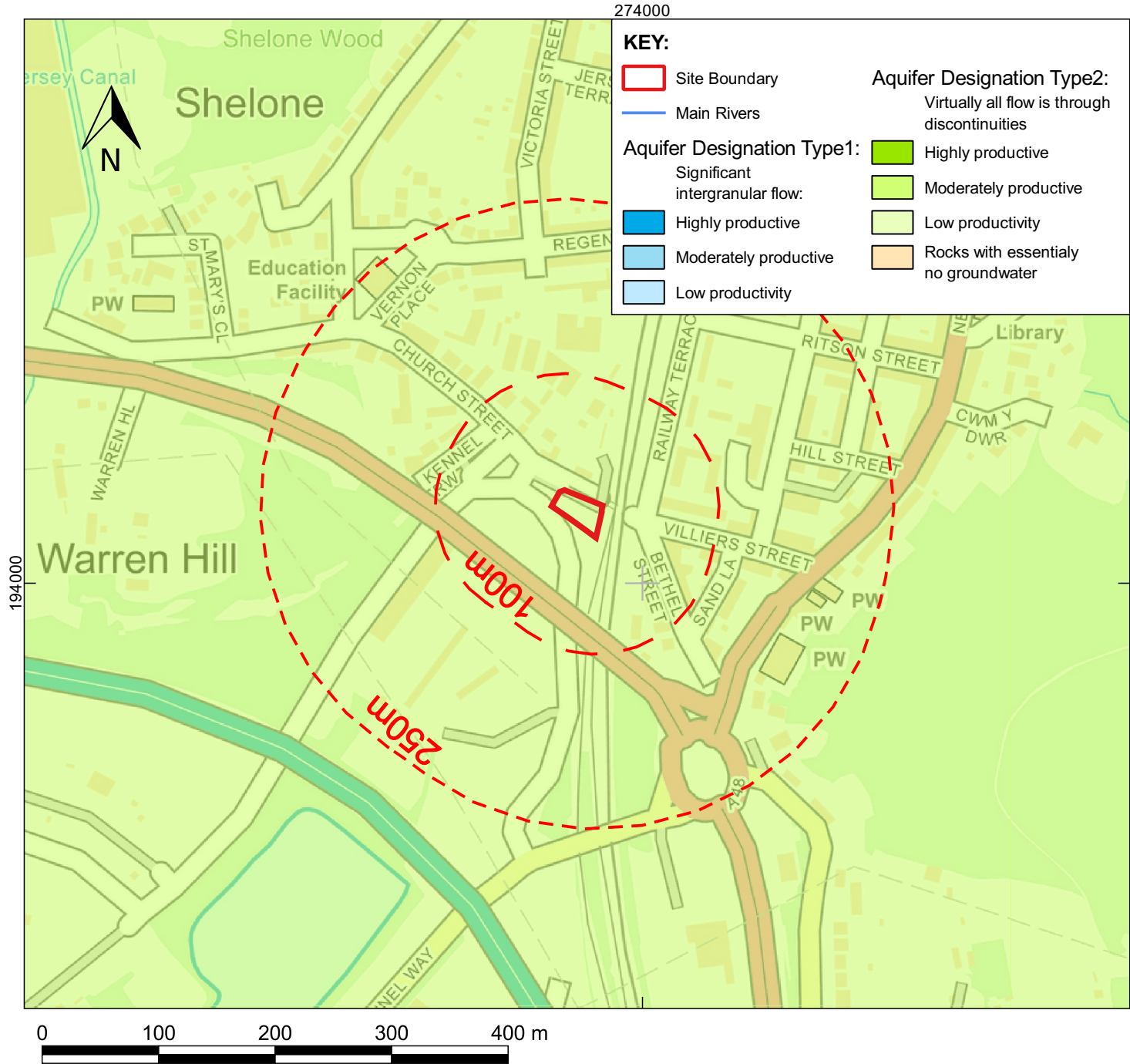
Total catchment (Zone 3) - Defined as the area around a source within which all groundwater recharge is presumed to be discharged at the source.

Special interest (Zone 4) - A fourth zone SPZ4 or 'Zone of Special Interest' was previously defined for some sources. SPZ4 usually represented a surface water catchment which drains into the aquifer feeding the groundwater supply (i.e. catchment draining to a disappearing stream).

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BRITISH GEOLOGICAL SURVEY 1:625,000 SCALE AQUIFER DESIGNATION



The hydrogeological map indicates aquifer potential in generalised terms using a threefold division of geological formations:

1. those in which intergranular flow in the saturated zone is dominant
2. those in which flow is controlled by fissures or discontinuities
3. less permeable formations including aquifers concealed at depth beneath covering layers

Highly productive aquifers are distinguished from those that are only of local importance or have no significant groundwater. Within each of these classes the strata are grouped together according to age or lithology.

The 1:625 000 scale data may be used as a guide to the aquifers at a regional or national level, but should not be relied on for local information.

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