ARDENT
CONSULTING ENGINEERS
AN EMPLOYEE OWNED COMPANY

Net Zero Twenty Five Ltd

Maes Bach, Pontypridd

Maes Bach, Upper Boat, Rhondda Cynon Taf, Pontypridd Wales, CF38 1SL

Flood Consequence Assessment and Drainage Strategy

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1. Introduction

Preface

1.1 Ardent Consulting Engineers (hereafter referred to as Ardent) has been commissioned by Firstway Energy (acting on behalf of Net Zero Twenty Five Ltd) to prepare a Flood Consequence Assessment (FCA) and Drainage Strategy for the proposed Energy Storage System (ESS) development on Land at Maes Bach, Upper Boat, Pontypridd, W6 9AR (hereafter referred to as the "Site") to support a full planning application to be submitted to the Rhondda Cynon Taf County Council. The site descriptions is as follows:

"Development of an Energy Storage System (ESS) and associated site access, landscaping and ancillary works for a grid connection".

1.2 This Flood Consequence Assessment has been developed in line with Planning Policy Wales (PPW) 12th Edition released February 2024 and Planning Policy Wales Technical Advice Note 15 Development and Flood Risk (TAN 15) most recently updated in December 2021. The report demonstrates that the Site can be suitably redeveloped whilst complying with the requirements of the PPW in terms of Flood Risk.

1.3 A Sustainable Drainage Strategy has also been included within this document to demonstrate how surface water flows from the development will be managed appropriately.

2. Baseline Parameters

Existing Site

2.1 The development Site is located at Maes Bach, Upper Boat, Rhondda Cynon Taf, Pontypridd Wales, CF38 1SL. The Site is approximately 4.8ha and is located at National Grid reference (NGR) ST 10448 85641. Refer to **Figure 2-1** below.

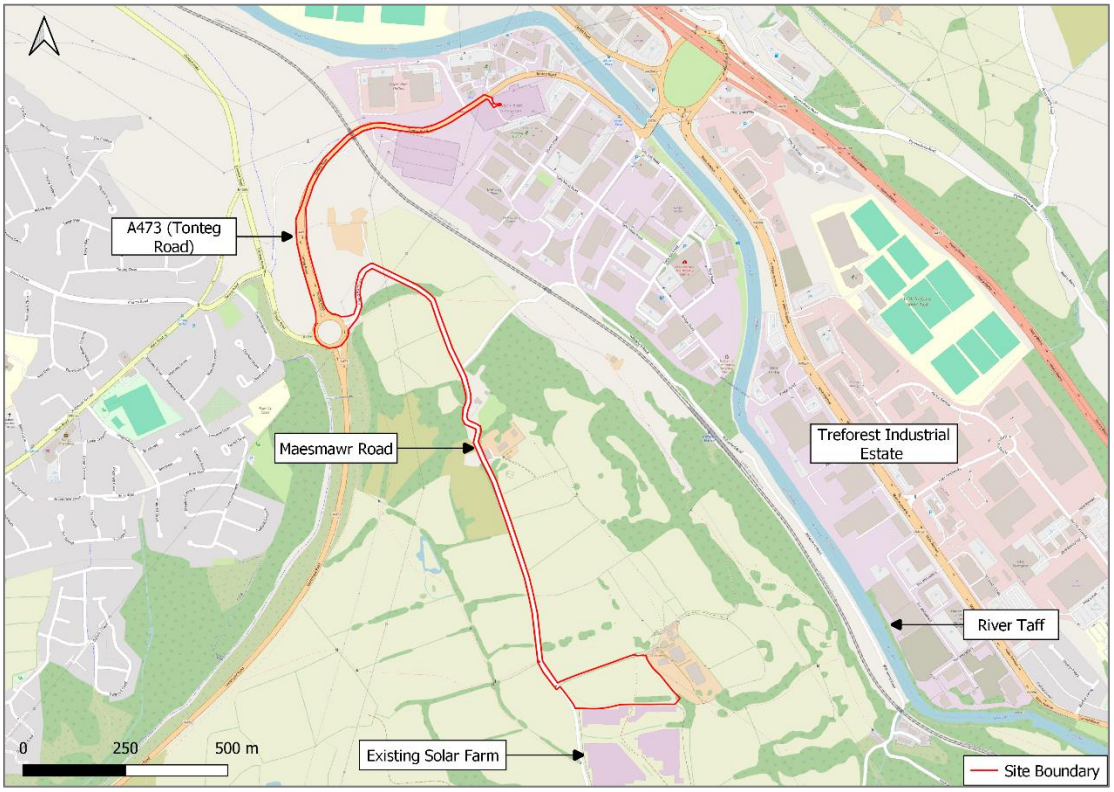

Figure 2-1: Site Location Plan

2.2 The Site is surrounded in all directions by agricultural land, with industrial development, including the Treforest Industrial Estate to the east and a commercial solar farm to the south. The River Taff is also located adjacent to the Site's eastern boundary. The access road (Maesmawr Road) travels northwards away from the Site and meets the A473 roundabout to the northwest.

2.3 The current Site comprises of agricultural fields.

Development Proposals

2.4 The development proposals are for the erection of an Energy Storage System (ESS) with associated ancillary infrastructure, access and landscaping.

2.5 The development proposals are shown below in **Figure 2-2**. Full proposals are included within **Appendix A.**

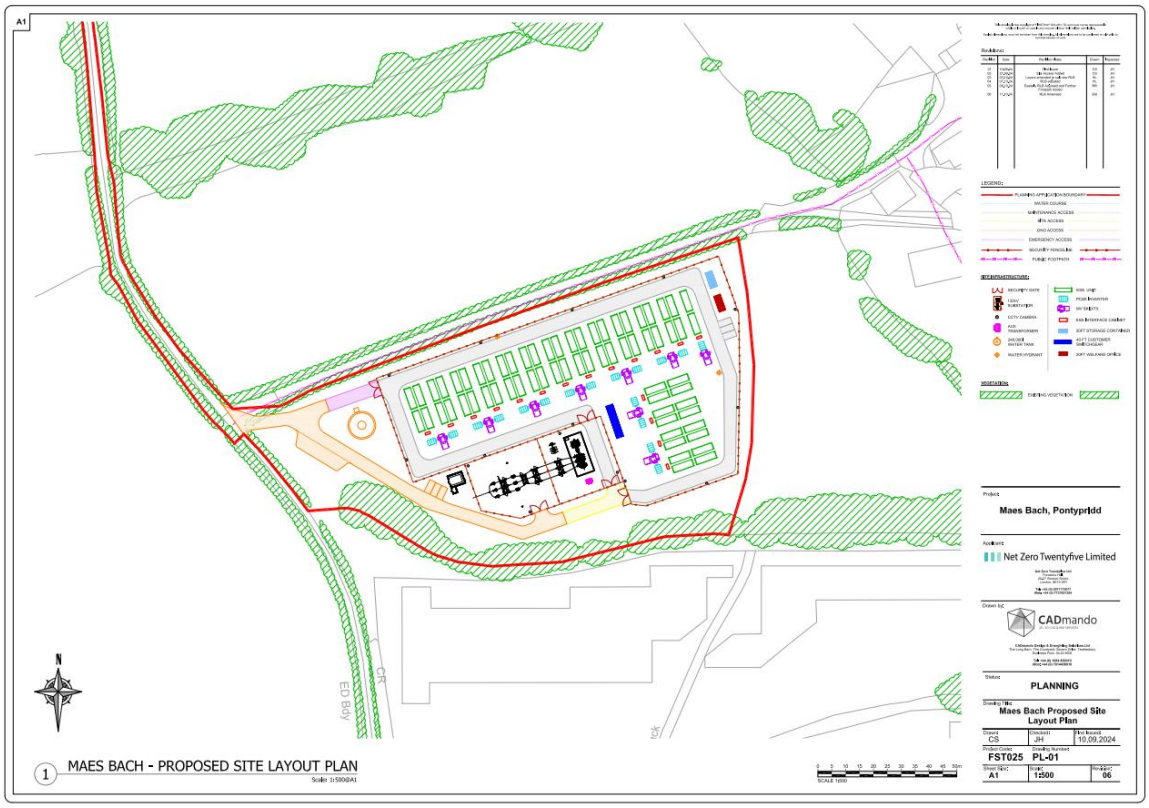

Figure 2-2: Development Proposal

2.6 Access to the Site will be from Maesmawr Road at the west of the Site.

Topography

2.7 A topographical survey of the western area of the Site, covering the entire area outlined for development, was carried out by Anthony Brookes Surveys Ltd in August 2024 and is presented in **Appendix B**.

2.8 The highest level within the area proposed for development is 121.78m AOD in the north-west corner, within the foliage and adjacent to the northern and southern boundaries. The lowest level within the area proposed for development of 114.8m AOD at the east.

2.9 In general, levels within the area proposed for development fall gently eastwards.

Hydrology

2.10 The nearest main river to the Site is the River Taff, located approximately 500m east of the Site, flowing south and discharging into Cardiff Bay 14km to the south-east.

2.11 There are no other surface water bodies in the vicinity of the Site.

Ground Conditions

2.12 According to the British Geological Survey (BGS) Geoindex Viewer, the Site is shown to be underlain by superficial deposits of till, Devensian – diamicton, as well as glaciofluvial deposits of sand and gravel. The bedrock geology underlying the Site is shown to comprise of the Grovesend Formation – Mudstone, Siltstone and Sandstone.

2.13 According to DEFRA's 'Magic Maps', the Site is underlain by an 'Secondary A' aquifer. According to the BGS, Secondary A aquifers comprise permeable layers that can support local water supplies, and may form an important source of base flow to rivers.

2.14 Borehole records obtained from the BGS website do not indicate a high groundwater level.

Existing Sewer Infrastructure

2.15 The Site is in a rural location and therefore it is unlikely that any public sewer infrastructure is present underlying the Site or the surrounding area.

3. Policy Context

Planning Policy Wales

3.1 Planning Policy Wales (PPW) sets out the land use planning policies of the Welsh Government. Section 6.6 in Planning Policy Wales (12th Edition – February 2024) relates to water and flood risk. This document has been consulted and referred to (where relevant) in the production of the FCA.

Planning Policy Wales Technical Advice Note 15 Development and Flood Risk (TAN 15)

3.2. The Planning Policy Wales Technical Advice Note 15 Development and Flood Risk (TAN 15), published in July 2004, provides technical guidance which supplements the policies set out in PPW in relation to flooding and coastal erosion. It provides a framework within which the flood risks arising from rivers, the sea and surface water, and the risk of coastal erosion can be assessed. It also provides advice on the consequences of the risks and adapting to and living with flood risk.

3.3. The general approach of TAN 15 is to advise caution to in respect to new developments in area of flood risk by setting out a precautionary framework to guide planning decisions. The aim of the framework is to steer new developments away from areas which are at high risk of flooding. Where a development is considered to be located in a high-risk area, it will need to be assessed on the basis of the tests outlined in the technical advice note (i.e. the justification and the assessment of flooding consequences).

3.4. This document has been consulted and referred to (where relevant) in the production of the FCA.

3.5. An update to TAN15 was scheduled for June 2023, however this has been postponed following the re-consultation of the document. There is no indication when this re-consultation process will be complete or when the TAN 15 update will be formally adopted.

Statutory Standards for Sustainable Drainage Systems – Designing, Constructing, Operating and Maintaining Surface Water Drainage Systems

3.6. The Welsh Statutory Standards for Sustainable Drainage Systems, published in 2018, provided a statutory framework to enable designers, property developers, local authorities and other interested parties to demonstrate they have taken into

account the Welsh Governments planning advice on development and flood risk, nature conservation and planning. These standards provide information relating to the design, construction, operation and maintenance of Sustainable Drainage Systems (SuDS) serving new developments in rural or urban settings for more than one dwelling or where the area covered by construction work is equal or larger than 100m^2. These standards can also be applied to existing development for the delivery of 'retro-fit' schemes.

3.7. This document has been consulted and referred to (where relevant) in the production of the FCA.

Rhondda Cynon Taf County Council Local Development Plan (LDP) 2006 – 2021

3.8. The Local Development Plan (LDP) is a land use document which sets out how the County Borough will be developed over 15 years. The LDP will also contain detailed policies which will control the form of new development and setting out what new development should look like. This document provides the framework for decisions to be made up until 2021. It should be noted that a revised local development plan is currently being prepared, however it is not yet adopted.

Rhondda Cynon Taf Strategic Flood Consequence Assessment 2008

3.9. The Rhondda Cynon Taf Strategic Flood Consequence Assessment (SFCA) provides an overview of flood risk from all potential sources and informs flooding policies including the allocation of land for development. The report provides an assessment of the level of flooding geographically and outlines the constraints of flooding on future development proposals.

3.10. The following points provide a summary of the SFCA Report and recommendations:

- Initial assessment of flood sources across the 9 study sites indicates that flood risk is predominately fluvial
- The flood risks associated with minor watercourses and drainage systems should be explored further and management systems designed accordingly. This should be captured during the surface water management scheme detailed design phase pre-planning.
- Site specific FCAs will be needed to accompany any planning applications for the development sites.

Rhondda Cynon Taf Local Flood Risk Management Strategy and Action Plan

3.11. The Rhondda Cynon Taf Local Flood Risk Management Strategy (LFRMS) resents the Council's Objectives and Measures for managing the risk of flooding from local sources in Rhondda Cynon Taf which forms the framework within which communities have a greater say in local flood risk management decisions.

3.12. The Action Plan is a detailed plan for managing local flood risk over the next 6 years. These include specific tasks, activities or initiatives to deliver the objectives and measures contained in the Strategy.

Statutory Standards for Sustainable Drainage Systems – Designing, Constructing, Operating and Maintaining Surface Water Drainage Systems

3.13. The Welsh Statutory Standards for Sustainable Drainage Systems, published in 2018, provided a statutory framework to enable designers, property developers, local authorities and other interested parties to demonstrate they have taken into account the Welsh Governments planning advice on development and flood risk, nature conservation and planning. These standards provide information relating to the design, construction, operation and maintenance of Sustainable Drainage Systems (SuDS) serving new developments in rural or urban settings for more than one dwelling or where the area covered by construction work is equal or larger than 100m^2.

3.14. This document has been consulted and referred to (where relevant) in the production of the FCA.

Climate Change Allowances

3.15. The Welsh Government 'Adapting to Climate Change: Guidance for Flood and Coastal Erosion Risk Management Authorise in Wales (August 2022)' states that to allow for the predicted impacts of climate change on peak river flows, the following increases in river flood flows as a result of climate change should be allowed for in **Table 3-1** below:

Table 3-1: Severn River Basin District Peak River Flow Climate Change Allowances

Severn River Basin District	Total potential change anticipated for the 2020s (2015 to 2039)	Total potential change anticipated for the 2050s (2040 to 2069)	Total potential change anticipated for the 2080s (2070 to 2115)

Upper (90th)	25%	40%	70%
Central (50th)	10%	20%	25%

3.16. The projected peak river flow change is a range, with the highest estimate equally likely to occur as the lowest estimate. For this reason, it is recommended that the central estimate, or change factor, for the 2080s for the relevant river basin district is used to assess the potential impact of climate change as part of a flood consequence assessment (FCA) and to inform design levels. Therefore, an allowance of 25% would achieve the policy requirements in assessing the flood risk associated with the development.

3.17. The Welsh Government 'Adapting to Climate Change: Guidance for Flood and Coastal Erosion Risk Management Authorise in Wales (August 2022)' states that to allow for the predicted impacts of climate change on surface water run-off, the following increases in rainfall intensities as a result of climate change should be allowed for in **Table 3-2** below:

Table 3-2: Change to Extreme Rainfall Intensity

Applies Across all of Wales	Total potential change anticipated for the 2020s (2015 to 2039)	Total potential change anticipated for the 2050s (2040 to 2069)	Total potential change anticipated for the 2080s (2070 to 2115)
Upper (90th)	10%	20%	40%
Central (50th)	5%	10%	20%

3.18. Both the central and upper estimates should be assessed to understand the range of impact. As a minimum, development proposals should be assessed against the central estimate to inform design levels. As with river flood flows, it is recommended that the 2080s changes are used when considering any time beyond 2115. Therefore, a 40% allowance for climate change will be used when designing the drainage strategy for the proposed development.

Justification Test, Development Advice Map and TAN 15 Policy Requirements

3.19. The objective of the Justification Test outlined in TAN 15 is to direct new development towards suitable land within Flood Zone A, or failing that Flood Zone B. Where there are no reasonably available sites in Flood Zone A, local

planning authorities in their decision making should take into account the flood risk vulnerability of land uses and consider reasonably available sites in Flood Zone B before Flood Zone C is considered.

3.20. **Table 3-3 below,** extracted from TAN 15, outlines the policy requirements for a development based on which zone of the Development Advice Map (DAM) the proposed site is located within.

3.21. The site is located in DAM Zone A on the Natural Resources Wales online Flood Risk Map Viewer. As such, the Justification Test is not applicable and there are no constraints with regards to river and coastal flooding, other than to avoid increasing flood risk elsewhere. Local and national surface water policy requirements are still required to be adhered to.

Table 3-3: TAN 15 2004 Summary of Policy Requirements

DAM	Development Type (Section 5)	Planning Requirements (Section 4)	Acceptability Criteria (Section 7 & Appendix 1)	Development Advice (Section 5, 6, 7 & Appendix 1)
A	Emergency services Highly vulnerable development Less vulnerable development Other	• Justification test not applicable • Refer to surface water requirements	• No increase in flooding elsewhere	No constraints relating to river or coastal flooding, other than to avoid increasing risk elsewhere.
B	Emergency services	• If site levels are greater than the flood levels used to define adjacent extreme flood outline there is no need to consider flood risk further. • Refer to surface water requirements	• Acceptable consequences for nature of use • Occupiers aware of flood risk • Escape/evacuation routes present • Effective flood warning provided • Flood emergency plans and procedures • Flood resistant design • No increase in flooding elsewhere	Generally suitable for most forms of development. Assessments, where required, are unlikely to identify consequences that cannot be overcome or managed to an acceptable level. It is unlikely, therefore, that these would result in a refusal of planning consent on the grounds of flooding.
	Highly vulnerable development		• Acceptable consequences for nature of use • Occupiers aware of flood risk • Escape/evacuation routes present • Effective flood warning provided • Flood emergency plans and procedures • No increase in flooding elsewhere	
	Less vulnerable development		• Occupiers aware of flood risk • No increase in flooding elsewhere	
	Other	• Refer to surface water requirements	• No increase in flooding elsewhere	
C1	Emergency services Highly vulnerable development Less vulnerable development	• Application of justification test (section 6) , including acceptability of consequences (section 7 and appendix 1) • Refer to surface water requirements	• Acceptable consequences for nature of use • Flood defences adequate • Agreement for construction and maintenance costs secured • Occupiers aware of flood risk • Escape/evacuation routes present • Effective flood warning provided • Flood emergency plans and procedures • Flood resistant design • No increase in flooding elsewhere	Plan allocations and applications for all development can only proceed subject to justification in accordance with section 6 and acceptability of consequences in accordance with section 7 and Appendix 1.
	Other	• Application of acceptability of consequences (section 7 and appendix 1) • Refer to surface water requirements	• Acceptable consequences for nature of use • Occupiers aware of flood risk • Desirable if effective flood warning and evacuation routes/procedure provided depending on nature of proposal • No increase in flooding elsewhere	Plan allocations and applications for development should only be made if considered acceptable in accordance with section 7 and Appendix 1.
C2	Emergency services Highly vulnerable development	The flooding consequences associated with Emergency Services and highly vulnerable development are not considered to be acceptable. Plan allocations should not be made for such development and planning applications not proposed.		
	Less vulnerable development	• Application of justification test (section 6) , including acceptability of consequences (section 7 and appendix 1) • Refer to surface water requirements	• Acceptable consequences for nature of use • Flood defences adequate • Agreement for construction and maintenance costs secured • Occupiers aware of flood risk • Escape/evacuation routes present • Effective flood warning provided • Flood emergency plans and procedures	Plan allocations or applications for less vulnerable development can only proceed subject to justification in accordance with section 6 and acceptability of consequences in accordance with section 7 and Appendix 1.
	Other	• Application of acceptability of consequences (section 7 and appendix 1) • Refer to surface water requirements	• Flood resistant design • No increase in flooding elsewhere • Acceptable consequences for nature of use • Occupiers aware of flood risk • Effective flood warning provided • No increase in flooding elsewhere	Plan allocations and applications for development should only be made if considered acceptable in accordance with section 7 and Appendix

4. Sources of Flooding

4.1. The TAN 15 requires flood risk from the following sources to be assessed, each of which are assessed separately below:

- Fluvial sources (river flooding);
- Tidal sources (flooding from the sea);
- Groundwater sources;
- Pluvial sources (flooding resulting from overland flows);
- Sewer Flooding;
- Artificial sources, canals, reservoirs etc.; and,
- It also requires the risk from increases in surface water discharge to be assessed (surface water management).

Flood Zone Designation

4.2. Flood Zones refer to the probability of river and sea flooding, ignoring the presence of defences. Planning Policy Wales TAN 15 defines Flood Zones as follows:

- **Flood Zone A**: Considered to be at little or no risk of fluvial or tidal/coastal flooding. Justification test is not applied and do not need to consider further;
- **Flood Zone B**: Areas known to have flooded historically. Evidenced by sedimentary deposits. Used as part of the precautionary approach to indicate where site levels should be checked against the extreme (0.1% annual probability) flood. No need to consider flood risks further if site levels are greater than the extreme flood level;
- **Flood Zone C**: Based on Environment Agency extreme flood outline (0.1% annual probability). Indicates that flooding issues should be considered as an integral part of the decision making by the application of the justification test, including FCA.
- **Flood Zone C1**: Areas of the floodplain which are developed and served by significant infrastructure, including flood defences. Indicates that development can take place subject to the application of the justification test, including acceptability of consequences.
- **Flood Zone C2**: Areas of the floodplain without significant flood defence infrastructure. Indicates that only 'less vulnerable' development should be considered, subject to the application of the justification test, including

acceptability of consequences. Emergency services and highly vulnerable development should not be considered.

4.3. The online NRW Development Advice Map (DAM) shown below in **Figure 4-1** shows the vast majority of the site, including the area outlined for development, to be located within Flood Zone A, at little or no risk of fluvial or tidal/coastal flooding.

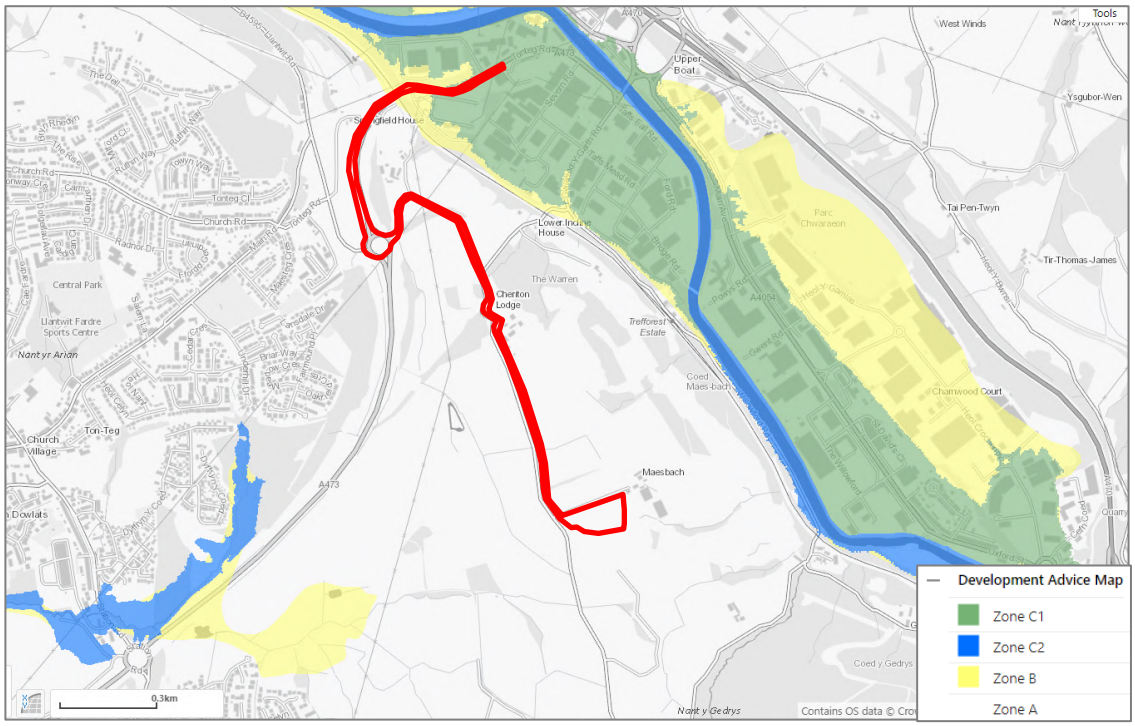

Figure 4-1: NRW Development Advice Map

4.4. Part of the northern section of the access road on the A473/Tonteg Road is located in Flood Zone B in an area known to have flooded in the past, likely evidenced by the presence of superficial deposits associated with the Rive Taff. Additionally, an adjacent area of the A473/Tonteg Road is located within Flood Zone C1 and is served by significant infrastructure included flood defences.

4.5. It should be noted that the small areas to the north of the site on the A473/Tonteg Road are existing areas which will not be altered or developed upon, with the exception of an underground cable being laid. The area proposed for development lies entirely within Flood Zone A and is located approximately 500m from the nearest area at increased risk of flooding.

Tidal Flood Risk

4.6. The site is located 15km inland at a lowest elevation of 116.5m AOD. Therefore, tidal flood risk at the site can be ruled as **negligible**.

Fluvial Flood Risk

4.7. The NRW 'Flood Map for Planning' in **Figure 4-2** below provides an almost identical flood zone extents as their Development Advice Map in **Figure 4-1** above.

4.8. The majority of the site, including the area outlined for development, is located within Flood Zone 1 at a less than 0.1% annual chance of flooding.

4.9. Part of the northern section of the access road on the A473/Tonteg Road is located in Flood Zone 2 at a 0.1% to 1% annual chance of flooding. Additionally, an adjacent area of the A473/Tonteg Road is located within Flood Zone 3 at a more than 1% annual chance of flooding.

4.10. As stated in Paragraph 4.5 above, the small areas to the north of the site on the A473/Tonteg Road are existing areas which will not be altered or developed upon with the exception of an underground cable being laid. The area proposed for development lies entirely within Flood Zone 1 and is located approximately 500m from the nearest Flood Zone 2/3 areas.

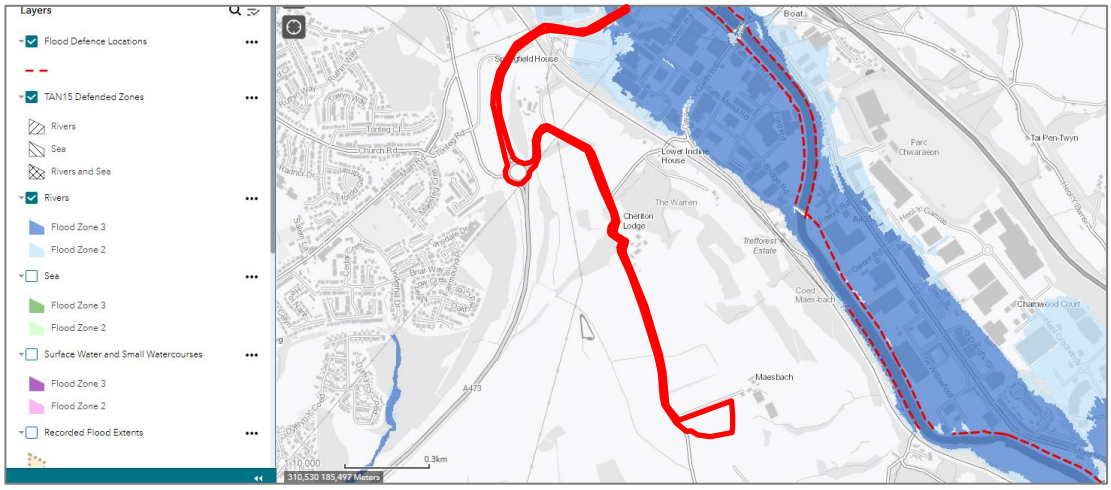

Figure 4-2: NRW 'Flood Map for Planning'

4.11. Therefore, the risk of fluvial flooding at the area outlined for development is assessed to be **low**.

Pluvial Flood Risk

4.12. The NRWs Flood Map for Planning (**Figure 4-3**) shows that the majority of the area outlined for development is not at risk of surface water flooding. A small area,

adjacent to the eastern boundary, is shown to be within Flood Zone 2, defined as an area with 0.1% to 1% chance of flooding from surface water and/or small watercourses in a given year, including the effects of climate change.

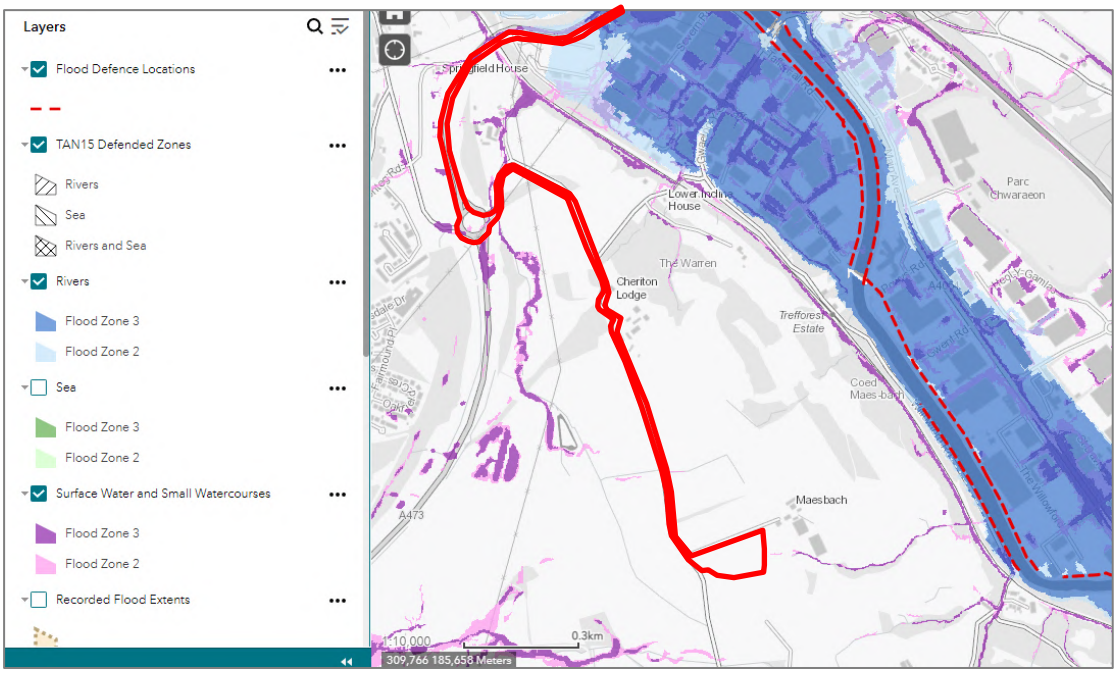

Figure 4-3: EA Risk of Surface Water Flooding – Extent

4.13. Surface water flow paths flow across parts of the site access roads on Pound Farm Lane and the A473/Tonteg Road. These flow paths comprise of areas within Flood Zone 2 (a 0.1% to 1% annual chance of flooding each year including climate change) and Flood Zone 3 (a greater than 1% annual chance of flooding each year including climate change).

4.14. The areas at risk of surface water flooding on the access roads are existing developed areas which will not be altered or further developed upon.

4.15. Therefore, the risk of pluvial flooding to the Site is assessed as **low**.

Groundwater Flood Risk

4.16. The Rhondda Cynon Taf Strategic Flood Consequence Assessment 2008 has uncovered no evidence of groundwater flood risk within the county.

4.17. The superficial deposits underlying the site comprise of diamiction, sand and gravel, with the bedrock underlying the site comprising mudstone, siltstone and sandstone. Therefore, the ground conditions may facilitate groundwater emergence.

4.18. Despite this, borehole records from the BGS website surrounding the site indicate a layer of clay situated above the bedrock in areas with no superficial deposits, which would reduce the ability for groundwater to emerge.

4.19. A review of available borehole data from the BGS website identified groundwater struct at a depth of 3.7m below ground level, at borehole ST18NW194 adjacent to Pound Farm Lane (part of the access road).

4.20. As the site is not developing in a manner sensitive the groundwater flooding (e.g. basements), groundwater flood risk to the site is assessed to be **low**.

Sewer Flood Risk

4.21 NRW are the statutory sewerage undertaker for the site. The SFCA have provided no evidence of any recorded incidents of sewer flooding at the site

4.22 Additionally, due to the site's rural location, it is unlikely that there is public sewer infrastructure underlying the area proposed for the development or surrounding area.

4.23 The risk of flooding from sewers is therefore considered to be **low.**

Flood Risk from Artificial Sources

4.24. According to the NRW Flood Map for Planning, the site does not fall within an area at risk of flooding from reservoirs.

4.25. Consequently, the risk of flooding from reservoirs is assessed to be **low**.

5. Drainage Strategy

5.1. Natural Resources Wales (NRW) Statutory standards technical guidance for Sustainable Drainage Systems (SuDS) and CIRIA Guidance C753 "The SuDS Manual" have been used to determine the appropriate SuDS Strategy, which considers the spatial and environmental constraints of the Site.

5.2. In accordance with the Planning Policy Wales (PPW), an allowance of 40% for the effects of climate change will achieve the policy requirements for the proposed development.

Proposed Sustainable Drainage Systems (SuDS)

5.3. In accordance with the Welsh Ministers Statutory Standards for SuDS, surface water run-off should be disposed of according to the following hierarchy:

Priority Level 1 – surface water run-off is collected for use;

Priority Level 2 – surface water run-off is infiltrated to ground

Priority Level 3 – surface water run-off is discharged to a surface water body

Priority Level 4 – surface water run-off is discharged to a surface water sewer, highway drain, or another drainage system,

Priority Level 5 – surface water runoff is discharged to a combined sewer

5.4. As discussed in Section 2, BGS data shows that the site is underlain by superficial deposits of till, sand and gravel and a bedrock geology of mudstone, siltstone and sandstone. Disposal of surface water via infiltration would need to be confirmed by an intrusive site investigation undertaken as part of the detailed design, which can secured via planning condition.

5.5. As discussed in Section 2, the Site is in a rural location, therefore it is unlikely that any public sewer infrastructure surrounding the site is present and that properties within the vicinity of the Site (Maes Bach) drain via infiltration or discharge into nearby ditches or watercourses.

5.6. Existing borehole information available on the BGS website show records taken at various depths within approximately a 500m radius of the site. A record 500m south east from the Site shows clay at a depth of 13m and mudstone at a depth of 30m. Infiltration may not be possible, therefore surface water will be attenuated within

sustainable drainage features prior to being discharged to a nearby ditch to the south of the Site.

The constraints and opportunities for the use of SuDS techniques are appraised using the Management Train approach outline in CIRIA C753 'The SuDS Manual' in **Table 5-1** below:

Table 5-1: C753 SuDS Management Train

Type:	**Infiltration Devices (Source Control)**
Constraints:	Ground conditions obtained from boreholes within the area taken from the BGS website consist of mudstone and clay which would suggest that infiltration would not be possible.
Opportunities:	None, to be reviewed upon receipt of intrusive site investigations.
Type:	**Lined Permeable Paving (Source Control)**
Constraints:	It may not be possible to provide infiltrating permeable paving/permavoid due to unconfirmed ground conditions
Opportunities:	Permeable paving wrapped in geo-membrane could be used to provide surface water attenuation before discharging into the drainage system. A downstream defender will be utilised to mitigate the risk of mobilising pollutants into underlying geology.
Type:	**Rainwater Harvesting (Source Control)**
Constraints:	The benefits of rainwater harvesting on a specific design storm event cannot be quantified, due to the seasonal availability of storage within the structure. Considering the use of the site, the benefits of rainwater harvesting are limited.
Opportunities:	None.
Type:	**Swales, etc. (Permeable Conveyance)**
Constraints:	In order to provide practicable attenuation benefits 1:3 side-slope swales tend to require a significant land requirement. However 1:1 conveyance swales could be utilised where site layout allows.
Opportunities:	Swales before discharging into the drainage system
Type:	**Tree Pits/Rain Gardens**
Constraints:	Considering the proposed use and layout of the site, there are limited benefits to introducing these features.
Opportunities:	None
Type:	**Green Roofs**
Constraints:	Not compatible with the proposed development.
Opportunities:	None.
Type:	**Attenuation Tanks (End of pipe treatment)**
Constraints:	Below ground attenuation is not recommended at the site due to the need to attenuate firewater at the site which may contain pollutants.
Opportunities:	Should additional attenuation be required this could be achieved by use of lined geo-cellular storage attenuation.

5.7. After consideration of the CIRIA C753 approach, the most viable SuDS options for the development would be a combined solution of lined permeable paving and lined swales with 1:3 slopes. These SuDS options will be in sequence with flow control devices such as orifice plates, pumping chambers, hydrobrakes and penstocks to provide the necessary storage and treatment for up to the 1 in 100-year storm event including an allowance of 40% for climate change. The proposed drainage strategy is included within **Appendix C**. The National Fire Chiefs Council (NFCC) guidance requires a closed system to trap firewater within the drainage network should a fire arise on site which could contaminate run-off as firewater arising from a fire incident may result in high concentrations of substances which are harmful to the aquatic environment. Refer to Section 5.16 for further information on Fire Suppression Water.

Surface Water

5.8. The planning red line boundary area equates to approximately 5.02ha and is currently Greenfield area with existing access roads. Post-development, approximately 0.485ha of the site will become impermeable.

5.9. Existing peak Greenfield run-off rates for the Site were calculated in MicroDrainage using the ICP SuDS Methods and are presented in **Table 5-2** below. Full calculations can be found in **Appendix D**. Preliminary calculations suggest the proposed development would provide an additional run-off of 118.2 l/s from hardstanding areas during a 1 in 100-year storm event. Any such run-off would need to be attenuated within the Site using SuDS.

Table 5-2: Surface Water Run-off Rates

Return Period Event	Existing Greenfield Run-off Rate (Impermeable Area, l/s)	Unmitigated Brownfield Run-off (l/s)
Q_{bar}	10.1	-
Q_1	8.9	44.2
Q_{30}	17.8	94.0
Q_{100}	22.0	118.2

5.10. Flow modelling results show there is no flooding for the Site for the 1 in 100-year storm event including an allowance of 40% for climate change rainfall event. Flow modelling results are included within **Appendix E**.

Surface Water Quality

5.11. The recommended stage of treatment in terms of water quality would be provided through the use of swales, permeable paving and the inclusion of a downstream defender. In line with the SuDS Manual C753, Tables 26.2 and 26.3, the pollution hazard and mitigation indices associated with sites with heavy pollution are mitigated by the provision of SuDS features. This is provided in **Appendix F**.

5.12. Based on the CIRIA 753 Simple Index Treatment Method, the Site would have an associated pollution hazard level of 'Medium'.

5.13. The level of treatment provided by the proposed SuDS and drainage features for the site is summarised in **Table 5-3** below:

Table 5-3: Simple Index Method Treatment Table

	Mitigation Indices		
Source	TSS	Metals	Hydrocarbons
Medium	0.70	0.60	0.70
SuDS Components Provided			
Permeable Pavement	0.70	0.60	0.70
Swale	0.25	0.30	0.30
Check	+0.25	+0.30	+0.30

5.14. A manual/automatic penstock has been added to the drainage network, downstream of the swales and upstream of the pumping station, to trap firewater within the drainage network should a fire arise on site which could contaminate run-off. The penstock would automatically activate on the detection of pollutants within the water and the maintenance company would be notified. The penstock can also be activated manually. Water in the proposed swale would be tested to ensure there is no risk of contamination downstream and to ensure it would adequately be treated by the downstream defence. In the case of high pollutant levels, water would be collected and taken offsite for treatment.

Fire Suppression Water

5.15. Firewater arising from a fire incident may result in high concentrations of substances which are harmful to the aquatic environment. If these substances are allowed to enter into soil, drains or watercourses in an uncontrolled manner, it has the potential

to cause significant environmental damage. The proposed penstock and lined swale will mitigate the risk of fire water pollution from the site. The approximate storage volume from the swales is 270 m^3 and has the capacity to attenuate an additional 10% of flows to ensure firewater can be attenuated and stored within the swale before it can be transported and treated offsite. The provision of an additional 10% storage and a penstock to contain firewater is in line with guidance from CIRIA C736F Containment Systems for the Prevention of Pollution.

Future Maintenance

5.16. Maintenance of the drainage system, including the swale, will be carried out by a maintenance company; the name of the management company is to be advised. All maintenance will be in accordance with best practice and in line with guidance given in the CIRIA Manual C753. Please refer to **Appendix G** for an overview of the maintenance tasks required. A detailed Maintenance and Management Plan can be secured via planning condition.

6. Conclusion

6.1. Ardent have been commissioned by Net Zero Twenty Five Ltd to prepare a Flood Consequence Assessment (FCA) and Drainage Strategy for a proposed commercial development at Maes Bach, Upper Boat, Pontypridd, W6 9AR to support a planning application to be submitted to the Rhondda Cynon Taf County Council.

6.2. This Flood Consequence Assessment considers the current policy relating to flood risk, including the Flood and Water management Act (2010), Planning Policy Wales and local flood risk policy.

6.3. The majority of the site, including the area outlined for development, is located within Flood Zone A, at little or no risk of fluvial or tidal/coastal flooding. Part of the northern section of the access road on the A473/Tonteg Road is located in Flood Zone B in an area known to have flooded in the past, likely evidenced by the presence of superficial deposits associated with the Rive Taff. Additionally, an adjacent area of the A473/Tonteg Road is located within Flood Zone C1 and is served by significant infrastructure included flood defences.

6.4. In terms of fluvial flood risk, the majority of the site, including the area outlined for development, is located within Flood Zone 1 and is not at risk of flooding. Part of the northern section of the access road on the A473/Tonteg Road is located in Flood Zone 2 at a 0.1% to 1% annual chance of flooding. Additionally, an adjacent area of the A473/Tonteg Road is located within Flood Zone 3 at a more than 1% annual chance of flooding.

6.5. These areas at risk of fluvial flooding are existing areas which will not be altered or developed upon, with the exception of an underground cable being laid. Therefore, fluvial flooding has been assessed as low.

6.6. Tidal flooding has been ruled out.

6.7. Surface water flooding follows a similar pattern to fluvial flooding, with the majority of the site, including the area outlined for development, not shown to be at risk of flooding. Parts of the access road are shown to be at risk but these areas will not be altered or further developed upon, with the exception of an underground cable being laid.

6.8. It concluded that the site is at low risk of flooding from groundwater, sewers and from reservoirs.

6.9. The surface water drainage solution for the site is a combined solution of lined permeable paving and lined swales with 1:3 slopes. These SuDS options will be in

sequence with flow control devices such as orifice plates, pumping chambers, hydrobrakes and penstocks to provide the necessary storage and treatment for up to the 1 in 100-year storm event including an allowance of 40% for climate change.

6.10. The proposed penstock and lined swale will mitigate the risk of fire water pollution from the site. The approximate storage volume from the swales is 270 m^3 and has the capacity to attenuate an additional 10% of flows to ensure firewater can be attenuated and stored within the swale before it can be transported and treated offsite.

6.11. Hydraulic modelling software, Flow, was utilised to calculate the storage requirements for the site. Network modelling results show there is no flooding for the Site during rainfall events up to the 1 in 100-year storm event including an allowance of 40% for climate change, without increasing the risk of flooding elsewhere and allowing for firewater suppression allowance.

6.12. The maintenance of all SuDS components will be in accordance with the best practices and the CIRIA Manual C753. A private management company will maintain the surface water drainage network. The name of the management company is still to be confirmed.

6.13. In conclusion, this document demonstrates that the proposals are consistent with the aims of the PPW and local planning policy. The Site will not be at significant risk of flooding or increase the flood risk to others.

Appendix A

A1

Revisions:

Revision	Date	Revision Notes	Drawn	Inspected
01	10.09.24	First Issue	CS	DL
02	08.10.24	RLB Amended	RR	JH
03	11.10.24	RLB Amended	EM	JH

LEGEND:

PLANNING APPLICATION BOUNDARY

N

1 MAES BACH - SITE LOCATION PLAN

Scale: 1:2500@A1

0 50 100 150 200 250m

SCALE 1:2500

Project:

Maes Bach, Pontypridd

Consultant:

Net Zero Twentyfive Limited

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Drawn by:

CADmando
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Tel: +44 (0) 1684 850019
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Status:

PLANNING

Drawing Title:

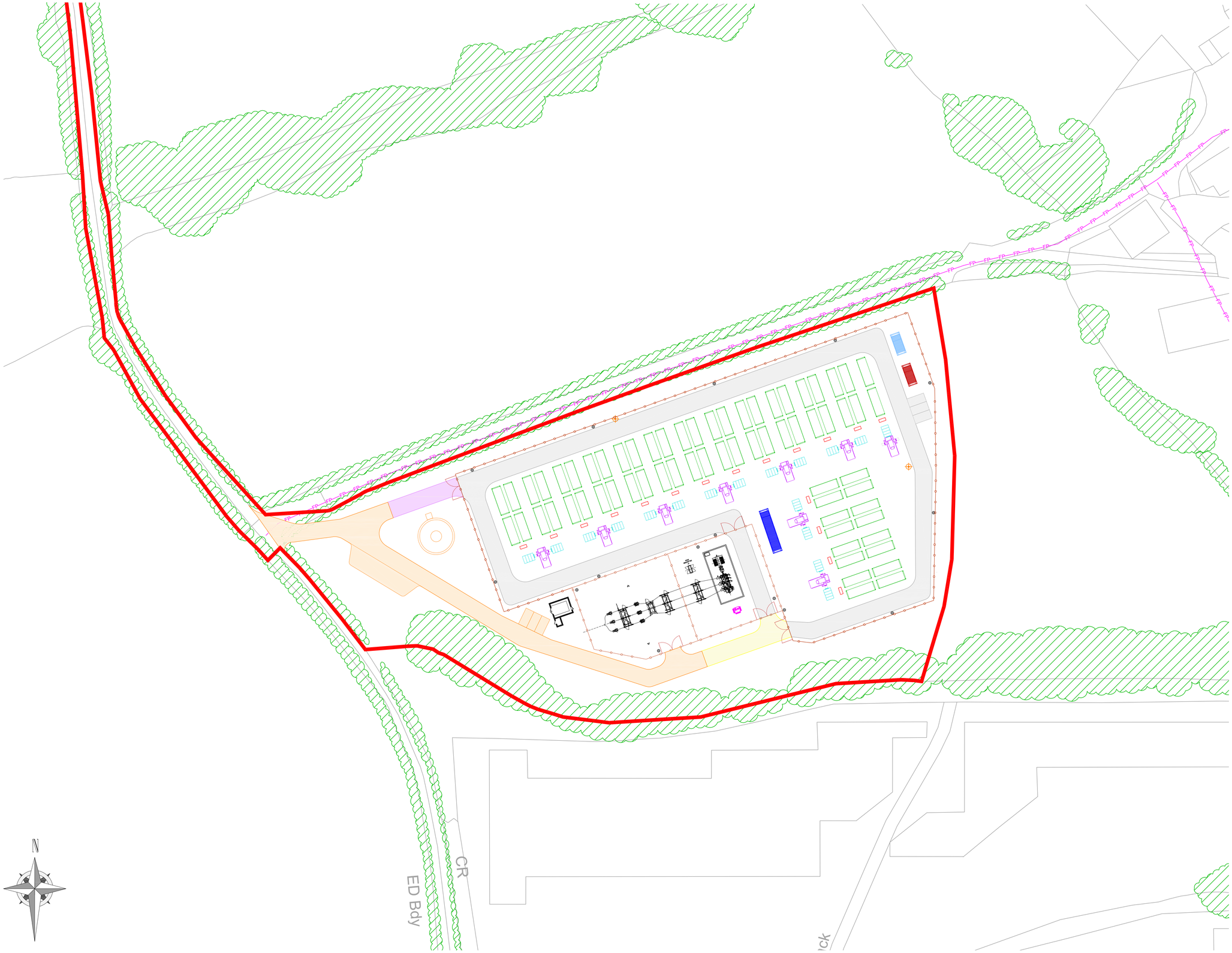
Maes Bach
Site Location Plan

Drawn:	Checked:	First Issued:
CS	JH	10.09.2024

Project Code: **FST025-** Drawing Number: **SP-01**

Sheet Size:	Scale:	Revision:
A1	1:2500	03

A1



Revisions:

Revision	Date	Revision Notes	Drawn	Inspected
01	10.09.24	First Issue	CS	JH
02	27.09.24	Site Access Added	CS	JH
03	07.10.24	Layout amended to suit new RLB	HL	JH
04	07.10.24	RLB adjusted	HL	JH
05	08.10.24	Easterly RLB Adjusted and Further Footpath Added	RR	JH
06	11.10.24	RLB Amended	EM	JH

LEGEND:

- PLANNING APPLICATION BOUNDARY
- WATER COURSE
- MAINTENANCE ACCESS
- SITE ACCESS
- DNO ACCESS
- EMERGENCY ACCESS
- SECURITY FENCELINE
- PUBLIC FOOTPATH

SITE INFRASTRUCTURE:

- SECURITY GATE
- 132kV SUBSTATION
- CCTV CAMERA
- AUX TRANSFORMER
- 240,000l WATER TANK
- WATER HYDRANT
- ESS UNIT
- PCSK INVERTER
- MV SKID/TX
- ESS INTERFACE CABINET
- 20FT STORAGE CONTAINER
- 40 FT CUSTOMER SWITCHGEAR
- 20FT WELFARE OFFICE

VEGETATION:

- EXISTING VEGETATION

N

1 MAES BACH - PROPOSED SITE LAYOUT PLAN

Scale: 1:500@A1

0 5 10 15 20 25 30 35 40 45 50m

SCALE 1:500

Project:

Maes Bach, Pontypridd

Applicant:

Net Zero Twentyfive Limited

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Status:

PLANNING

Drawing Title:

Maes Bach Proposed Site Layout Plan

Drawn:	Checked:	First Issued:
CS	JH	10.09.2024

Project Code:	Drawing Number:
FST025	**PL-01**

Sheet Size:	Scale:	Revision:
A1	**1:500**	**06**

Appendix B

185900.00 N

185800.00 N

185700.00 N

185600.00 N

310200.00 E

310300.00 E

310400.00 E

310500.00 E

310600.00 E

APPROX.

STANDARD REFERENCES

ABBREVIATIONS

bb	bellaha beacon	ko	kerb outlet
bl	bollard	lb	light bollard
brw	brick ret. wall	lp	lamp post
bs	bus stop	mh	manhole
bt	telecoms cover	mk	marker post
bw	brick wall	mp	metal post
catv	cable TV cover	np	nameplate (road)
cbf	closeboarded fence	obf	open boarded fence
cbrw	conc block ret. wall	p	post
cbw	conc block wall	pb	post box
cl	cover level	ret.	retaining wall
ctf	chainlink fence	re	rodding eye
conc	concrete	rg	road gully
cp	concrete post	rs	road sign
cw	concrete wall	rwp	rainwater pipe
cws	combined sewer	sp	signpost
dk	drop kerb	srw	stone ret. wall
ep	electricity pole	sv	stop valve
ESS	Elec. Sub-Station	svp	soil vent pipe
fb	flower bed	sw	stone wall
fh	fire hydrant	s/w	stay wire
fl	floor level	sws	storm water sewer
fws	foul water sewer	tcb	telephone callbox
g	gully	tl	traffic light
gsv	gas valve	tp	telegraph pole
h/r	hand rail	utr	unable to raise
ic	inspection cover	vp	vent pipe
il	invert level	w'wp	woodtop fence
irf	iron railing fence	wm	water meter
jb	junction box	wp	wood post

Notes

1. This survey has been computed and drawn "true to scale" and relates to the OSTN15 GPS National Grid at a single point.
2. All levels are in metres and relate to the mean of the nearest five Ordnance Survey active GPS stations (OSGM15).
3. This survey was measured for a scale of 1:500, any subsequent enlargements should be verified on site.

Revisions

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Regulated by RICS

Certificate Number 15302
ISO 9001, ISO 14001

Surveyed	C Langslow	Date	August 2024
Drawn	C Langslow	Checked	August 2024

Drawing Title: Topographical Survey
Maes Bach
Maesmawr Road
Pontypridd

Client: Firstway Solar Limited
Foresters Hall
25-27 Westow Street
London SE19 3RY

Drawing No.	Rev.	Scale A0 @
B452/13350/1		1:500