BETTS HYDRO
CONSULTING ENGINEERS

# LAND OFF LLAY ROAD, CEFN-Y-BEDD, WREXHAM

# DRAINAGE MANAGEMENT STRATEGY



For

Mr. Clint Shaw
130 Kingsway
Chester
Cheshire
CH2 2LW

CHRISTMAS FARM

**MARCH 2025**

This page has been intentionally left blank

BETTS HYDRO
CONSULTING ENGINEERS

# LAND OFF LLAY ROAD, CEFN-Y-BEDD, WREXHAM

# DRAINAGE MANAGEMENT STRATEGY

## Document Tracking Sheet

**Document Reference:** HYD666_CEFN.Y.BEDD_DMS
**Revision:** 2.2
**Date of Issue:** 25/03/25
**Report Status:** FINAL

**Prepared by:** [redacted]
Megan Berry BSc (Hons) MCIWEM
*Flood Risk Analyst*

[redacted]
Hannah Buchanan BSc (Hons) MSc GradCIWEM
*Flood Risk Analyst*

**Checked by:** [redacted]
Kirsty Halliday *BSc(Hons) MCIWEM*
Flood Risk Analyst

**Authorised by:** [redacted]
R[redacted]*ng (Hons) MSc MBA GMICE MCIWEM*
*Director*

**Revision History:**

| Rev.: | Date: | Status: | Prepared by: | Checked by: | Issued by: |
|---|---|---|---|---|---|
| 2.2 | 25.03.2025 | FINAL | HB | RDN | HB |
| 2.1 | 20.03.2025 | FINAL | HB | RDN | HB |
| 2.0 | 19.03.2025 | FINAL | HB | RDN | HB |
| 1.0 | 01.11.2021 | FINAL | MB | KW | MB |
| 0 | 29.10.2021 | DRAFT | MB | KW | MB |

Old Marsh Farm Barns
Welsh Road, Sealand
Flintshire CH5 2LY
Telephone: 01244 289 041

Betts Hydro Ltd trading as Betts Hydro. Registered in England and Wales No. 09663830
Head Office Betts Associates Ltd

www.betts-associates.co.uk

This page has been intentionally left blank

## EXECUTIVE SUMMARY

This Drainage Management Strategy was commissioned by Mr. Clint Shaw referred to hereafter as 'the client'. This assessment has been prepared to support a planning application for development located off Llay Road in Cefn-y-Bedd (Wrexham). The proposals are for the construction of a commercial building to provide an office, maintenance facility, hay/straw storage and sick/maternity bay for reindeer. The wider site will also be used as a tree farm for Christmas Trees.

In order for the development proposals to be justified in line with the guidance set out in SuDS Standards for Wales, new development must not increase flood risk elsewhere and where possible offer improvement on the pre-development situation. The sustainable drainage hierarchy has been considered in accordance with the Welsh SuDS Standards, which look to deal with surface water run-off as close to source as is practical.

Based on these published online datasets it is understood that infiltration may be able to offer a sustainable drainage solution in part or full. To confirm if infiltration will be feasible onsite given the mixed suitability for infiltration, it is recommended that Soakaway Testing (to BRE365) is undertaken at an early stage ascertain the specific onsite underlying ground conditions and suitability of such to achieve a full infiltration-based drainage approach for surface water run-off.

If infiltration is unable to offer a surface water management solution for the proposals (subject to onsite testing), it is proposed that the development proposals formally discharge surface water run-off into the onsite surface water body. It is understood based on anecdotal evidence that the existing body of water has incoming surface water flows from onsite overland flows and a conveyance route from the Ordinary Watercourse located adjacent to the eastern boundary of site. It is understood that this body of water infiltrates over an extended period of time.

The proposals will therefore be to formally discharge surface water run-off from the roof areas of the proposed development into this surface water body at a restrict greenfield rate (QBar). The proposals are also to increase the size of this existing surface water body to increase surface water attenuation and biodiversity properties. Detailed design will be required to confirm the feasibility of the strategy. and whether a site wide gravity system is achievable.

In accordance with the SuDS Standards for Wales (2018) all sites should endeavour to achieve as close to pre-development greenfield rates as is viable. Based on the nature and the size of the development, the pre-development greenfield rate (QBar) is calculated to be 3.4l/s. Restricting the rate of discharge will generate a requirement to provide onsite stormwater storage for the extreme rainfall events. The surface water scheme for the development will be designed to cater for the surface water run-off generated in storm events up to and including the 1 in 100yr return period with allowance for climate change.

This Drainage Management Strategy is commensurate with the site and in summary, the development can be considered appropriate in accordance with Welsh Governments Statutory Standards for Sustainable Drainage Systems, providing the mitigation measures proposed within are included within the development proposals. Full approval for the proposed drainage strategy will need to be sought from the SuDS Approval Body (Wrexham County Borough Council) separately by the developer in due course.

This page has been intentionally left blank

# CONTENTS

Document Tracking Sheet ..... iii

**EXECUTIVE SUMMARY ..... v**

Figures & Tables ..... vii

Appendix ..... viii

Abbreviations & Acronyms ..... viii

**1.0 INTRODUCTION ..... 9**

1.1 Planning Policy Context ..... 9

*Sustainable Drainage Approval Board (SAB) Requirements ..... 9*

1.2 Site Context ..... 9

1.3 Consultation ..... 9

**2.0 EXISTING SITE BACKGROUND ..... 10**

2.1 Location ..... 10

2.2 Existing and Historical Land Use ..... 10

2.3 Topography ..... 10

2.5 Justification for Development ..... 11

**3.0 DEVELOPMENT PROPOSALS ..... 12**

3.1 Nature of the development ..... 12

**4.0 SURFACE WATER MANAGEMENT ..... 13**

4.1 Standard 1 – Surface Water Run-Off Destination ..... 13

4.2 Standard 2 – Surface Water Run-Off Hydraulic Control ..... 16

4.3 Standard 3 – Water Quality ..... 16

4.4 Standard 4 – Amenity ..... 16

4.5 Standard 5 – Biodiversity ..... 17

4.6 Standard 6 - Design of Drainage for Construction, Operation and Maintenance ..... 17

4.7 Climate Change ..... 18

4.8 Foul Water Management ..... 18

**5.0 SUMMARY AND CONCLUSIONS ..... 20**

**6.0 RECOMMENDATIONS ..... 22**

**BIBLIOGRAPHY & REFERENCES ..... 23**

Web-based References ..... 23

## Figures & Tables

Figure 1: Existing Site Features Plan (Google Maps, 2025) ..... 10

Figure 2: Proposed Planning Layout (Axis, 2025) ..... 12

Figure 3: Proposed Drainage Strategy Plan Extract (Betts Hydro, 2025) ..... 15

## Appendix

APPENDIX A: SuDS STANDARDS FOR WALES EXTRACTS
APPENDIX B: NRW CORRESPONDENCE & FLOOD MAPPING
APPENDIX C: WW SEWER CORRESPONDENCE
APPENDIX D: LLFA/LPA CORRESPONDENCE
APPENDIX E: LOCATION PLAN
APPENDIX F: TOPOGRAPHIC SURVEY
APPENDIX G: PROPOSED PLANNING LAYOUT
APPENDIX H: PFRA/SPRA INFORMATION
APPENDIX I: SURFACE WATER CALCULATIONS
APPENDIX J: DRAINAGE PLANS
APPENDIX K: SUDS EXAMPLES
APPENDIX L: TECHNICAL NOTE 003 – FOUL WATER DRAINAGE
APPENDIX M: KEE PROCESS – PRODUCT SPECIFICATIONS
APPENDIX N: NOTES OF LIMITATIONS

## Abbreviations & Acronyms

| | |
|---|---|
| **BGS** | British Geological Survey |
| **CC** | Climate Change |
| **FCA** | Flood Consequence Assessment |
| **FEH** | Flood Estimation Handbook |
| **Ha** | Hectare |
| **HD** | Hafren Dyfrdwy |
| **LLFA** | Lead Local Flood Authority |
| **LPA** | Local Planning Authority |
| **mAOD** | metres Above Ordnance Datum |
| **NGR** | National Grid Reference |
| **NRW** | National Resources Wales |
| **NSRI** | National Soil Resource Institute |
| **PFRA** | Preliminary Flood Risk Assessment |
| **PPW** | Planning Policy Wales |
| **QSE** | Quick Storage Estimate |
| **SFCA** | Strategic Flood Consequence Assessment |
| **SAB** | SuDS Approving Body |
| **SuDS** | Sustainable Drainage Systems |
| **TAN15** | Technical Advice Note 15 |

# 1.0 INTRODUCTION

## 1.1 Planning Policy Context

1.1.1 All forms of flooding and their impact on the natural and built environment are material planning considerations. Planning Policy Wales (PPW) sets out the Government's objectives for the planning system, and how planning should facilitate and promote sustainable patterns of development, avoiding flood risk and accommodating the impacts of climate change. Government policy with respect to development in flood risk areas is contained within the PPW, Technical Advice Note 15, (TAN15) 'Development and Flood Risk' scheduled to be re-issued in December 2021.

### *Sustainable Drainage Approval Board (SAB) Requirements*

1.1.2 From January 2019, all new developments of at least 2 properties or over 100m² in Wales will be required to have Sustainable Drainage Systems (SuDS) to manage surface water run-off generated by the proposals. These SuDS must be designed and constructed in accordance with the Welsh Government standards for sustainable drainage. Schedule 3 of the Flood and Water Management Act 2010 (FWMA) establishes Gwynedd Council as a SuDS Approving Body (SAB).

1.1.3 The SAB have statutory responsibility for approving and where appropriate adopting the proposed drainage systems on new developments. The SAB application is undertaken separately to the planning permissions and developers are required to obtain both planning approval and SAB approval prior to commencement of any proposed construction works. This Flood Consequence Assessment and Drainage Management Strategy is to support the proposed planning application. SAB approval will need to be sought separately by the developer once more details are available for the drainage proposals.

## 1.2 Site Context

1.2.1 This DMS has been prepared to support a planning application for development located off Llay Road in Cefn-y-Bedd (Wrexham). The proposals are for the construction of a commercial building to provide an office, maintenance facility, hay/straw storage and sick/maternity bay for reindeer. The wider site will also be used as a tree farm for Christmas Trees.

## 1.3 Consultation

1.3.1 The preparation of this report has been undertaken in consultation with Natural Resources Wales (NRW), Wrexham County Borough Council (WCBC) and Welsh Water (WW). The responses can be seen in **Appendix B**, **C** and **D**. The Local Planning Authority (LPA), WCBC (also acts as the Lead Local Flood Authority), will make the final decision about any planning permission. The LPA should consult with NRW who will provide advice and guidance on flood issues at a strategic level and in relation to planning applications

# 2.0 EXISTING SITE BACKGROUND

## 2.1 Location

2.1.1 The site is located off Llay Road in Cefn-y-Bedd (Wrexham), the nearest Ordnance Survey National Grid Reference is E: 331724, N: 355636 and the nearest postcode is LL12 9UG (see location plan in **Appendix E**). The site is surrounded to the north, east, south, and west by undeveloped land. Adjacent to the northern boundary is Llay Road and adjacent to the west of site is Park Road, as illustrated in **Figure 1**.

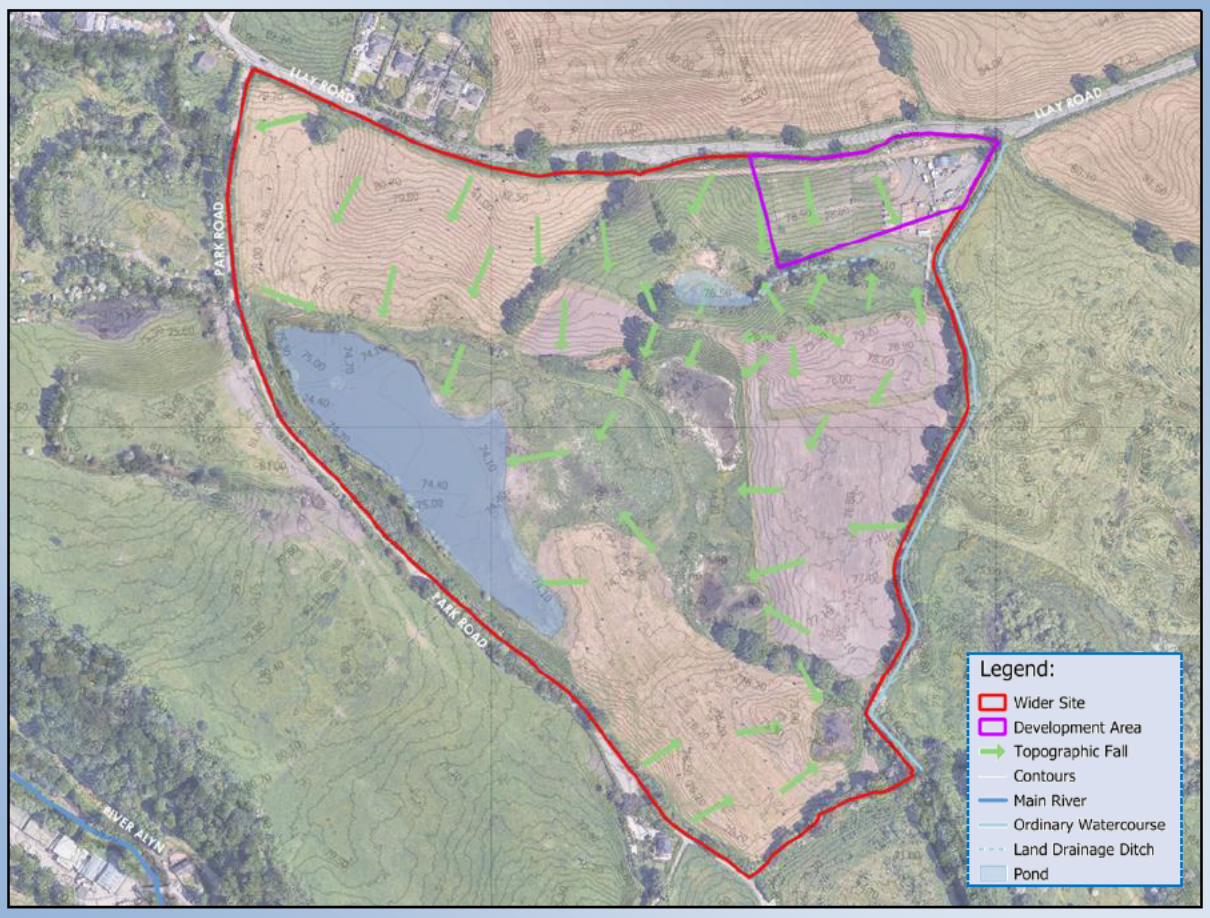



*Figure 1: Existing Site Features Plan (Google Maps, 2025)*

## 2.2 Existing and Historical Land Use

2.2.1 The development site is currently undeveloped land and comprises of low to high density vegetation, with some taller shrubs along the field boundaries. The land is currently used for agricultural purposes and no other historical use has been identified as part of this assessment.

## 2.3 Topography

2.4.1 TAN15 requires all sources of flood risk to be considered, taking into consideration the existing terrain and ground levels. A site-specific topographic survey has not been carried out to support this assessment however LiDAR data has been obtained and

identified the ground levels onsite to vary from 84.0mAOD along the northern site boundary, down to 74.1mAOD within a low-lying depression to the south of the site (see Elevation Plan included in **Appendix F**).

## 2.5 Justification for Development

2.5.1 Planning Policy Wales (5th Ed. – November 2012) states that the Welsh Government is committed to promoting 'sustainable development' by providing for homes, infrastructure, investment and jobs in a way which is consistent with sustainable development principles PPW Sec. 2.2).

2.5.2 The FCA will be considerate to the nature and scale of the proposals and will review flood risk to and from the development along with considering any appropriate mitigation measures based on the identified risks.

2.5.3 The development proposals are of a 'Less Vulnerable' nature but will be located solely within Flood Zone A. Mitigation measures are proposed to safeguard the development against any potential residual flood risks identified and it is considered that the proposals can be justified in accordance with TAN15 Guidance.

# 3.0 DEVELOPMENT PROPOSALS

## 3.1 Nature of the development

3.1.1 This assessment has been prepared to support a planning application for the development of an agricultural building located off Llay Road in Cefn-y-Bedd. The proposals are for the construction of a commercial building to provide an office, maintenance facility, hay/straw storage and sick/maternity bay for reindeer. The wider site will also be used as a tree farm for Christmas Trees. The proposals will be complete with access, cark parking, boundary fencing and drainage (full plan in **Appendix G**).

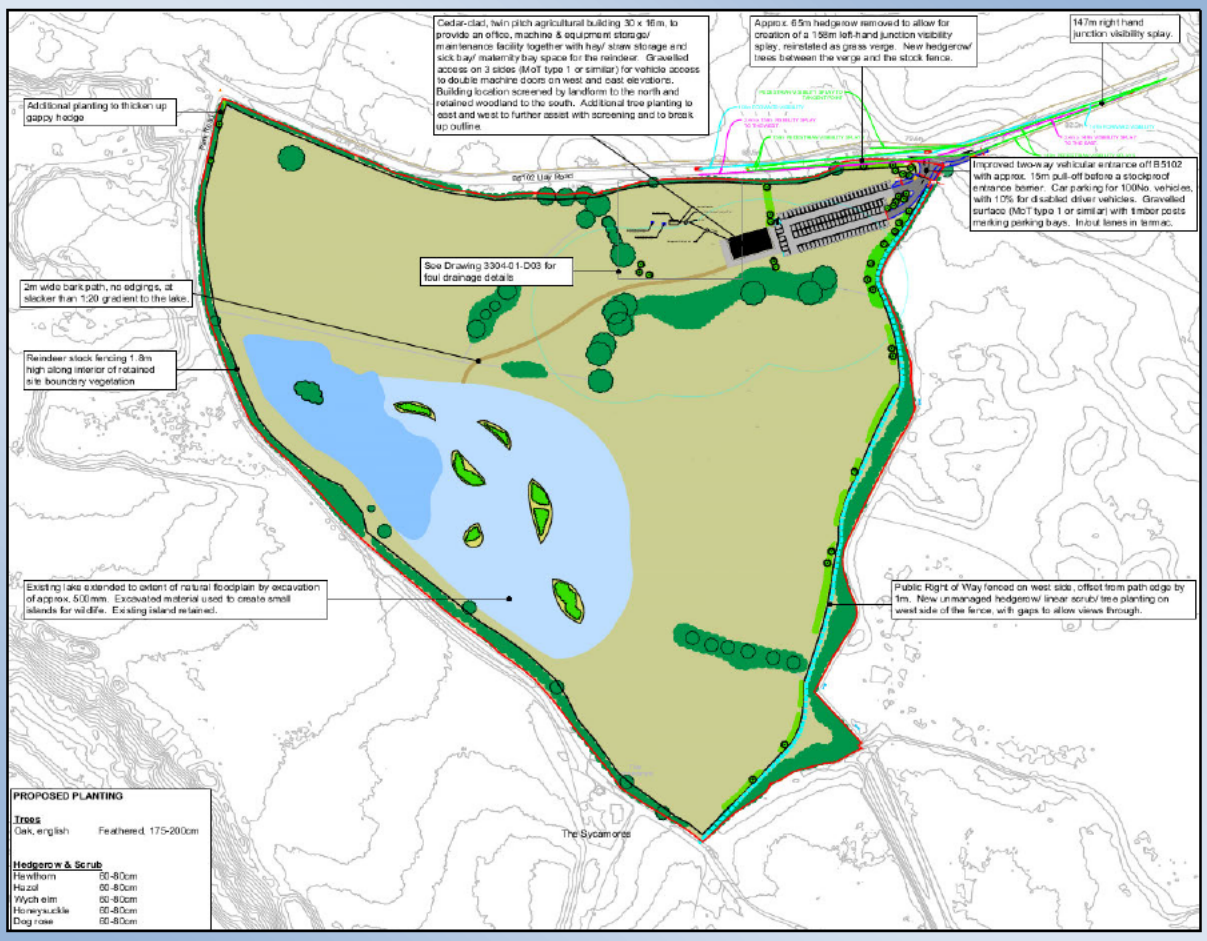



*Figure 2: Proposed Planning Layout (Axis, 2025)*

3.1.2 The total site area covers 17.0ha however the development area will cover a smaller 0.89ha. The development area excludes the land within the wider site that remain as greenfield. It is understood that the site is 100% permeable at present, however given the development proposals it is understood that the impermeable areas will increase to 14% (0.124ha) of the development area post-development.

3.1.3 All new developments over 100m² (or consisting of at least 2 properties) in Wales will be required to have Sustainable Drainage Systems (SuDS) to manage surface water run-off generated by the proposals. These SuDS must be designed and constructed in accordance with the Welsh Government standards for sustainable drainage. The SAB (WCBC) have statutory responsibility for approving and where appropriate adopting the proposed drainage systems on new developments.

# 4.0 SURFACE WATER MANAGEMENT

4.0.1 In accordance with national and local drainage hierarchies, the principal focus of this assessment is on the effective management of surface water run-off generated by the new development. Surface water run-off management options have been assessed in accordance with the sustainable drainage hierarchy. The Welsh Government: 'Statutory standards for sustainable drainage systems' (2018) are aimed at ensuring that the most effective drainage scheme is delivered for protecting and enhancing both the natural and built environment, these are discussed further below.

## 4.1 Standard 1 – Surface Water Run-Off Destination

4.1.1 Standard S1 comprises of five levels, which are discussed in detail in this assessment subsequently. The Fixed Standards S2 to S6 do not have exception criteria and prioritised levels. They specify all the criteria that need to be met to show compliance to the Standards. The five levels for S1 are:

- Priority Level 1: Surface water runoff is collected for use.
- Priority Level 2: Surface water runoff is infiltrated to ground.
- Priority Level 3: Surface water runoff is discharged to a surface water body.
- Priority Level 4: Surface water runoff 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.

***Priority Level 1: Surface water runoff is collected for use.***

4.1.2 Surface water re-use is applicable for residential properties. An external water butt will be provided for each dwelling to collect rainwater from roof tops, to promote domestic external water re-use. Internal rainwater harvesting systems are not proposed. In line with section G1.4 of the 'Statutory standards for sustainable drainage systems', internal rainwater harvesting is not proposed for this site as:

- There is no foreseeable demand for non-potable water on the site throughout its design life.
- There is no foreseeable need to harvest water at the site and Welsh Water have not identified potential stresses on mains water supplies in this area.
- The use of internal rainwater harvesting is not a cost-effective part of the solution for managing surface water runoff on the site, taking account of the potential water supply benefits of such a system.

***Priority Level 2: Surface water runoff is infiltrated to ground.***

4.1.3 Any proposed impermeable areas that can drain to soakaway or an alternative method of infiltration would significantly improve the sustainability of any surface water systems. The published online datasets have been reviewed to consider how favourable the underlying strata is to support a potential infiltration-based solution.

4.1.4 The British Geology Survey (BGS) mapping data indicates that ground conditions comprise of Halesowen Formation (Mudstone, Siltstone and Sandstone). The Cranfield Soil and Agrifood Institute Soilscapes soil type viewer identifies the soils to be Freely draining slightly acid loamy soils. Furthermore, based on the FEH catchment data, the soil factor for the area has been identified to be 0.3, which suggests the soils may be permeable (based on a scale of 0.1 to 0.5, with 0.5 being impermeable).

4.1.5 Based on these published online datasets it is understood that infiltration may be able to offer a sustainable drainage solution in part or full. To confirm if infiltration will be feasible onsite given the mixed suitability for infiltration, it is recommended that Soakaway Testing (to BRE365) is undertaken at an early stage ascertain the specific onsite underlying ground conditions and suitability of such to achieve a full infiltration-based drainage approach for surface water run-off.

4.1.6 Discharge rates are limited by the rate of infiltration; it is therefore recommended that the chosen infiltration-based discharge method(s) are designed to BRE365 standards in accordance with the CIRIA SuDS Manual. Discussion with Wrexham County Borough Council and Welsh Water will also be required to ensure that the proposed infiltration methods conform to their design requirements.

4.1.7 By ensuring surface water run-off is managed appropriately the risk of increasing flooding offsite because of the proposals will be minimised which conforms with local and national planning guidance. The proposed onsite drainage will need to be designed to collectively cater for the run-off generated, during the storm events up to and including the 1 in 100-year return period event, with 40% allowance for climate change.

***Priority Level 3: Surface water runoff is discharged to a surface water body.***

4.1.8 If infiltration is unable to offer a surface water management solution for the proposals (subject to onsite testing), it is proposed that the development proposals formally discharge surface water run-off into the onsite surface water body. Review of the mapping had identified the presence of a large body of water located adjacent to the western boundary of the wider site area.

4.1.9 It is understood based on anecdotal evidence that the existing body of water has incoming surface water flows from onsite overland flows and a conveyance route from the Ordinary Watercourse located adjacent to the eastern boundary of site. It is understood that this body of water infiltrates over an extended period of time.

4.1.10 The proposals will therefore be to formally discharge surface water run-off from the roof areas of the proposed development into this surface water body at a restrict greenfield rate (QBar), as illustrated within **Figure 3**. The proposals are also to increase the size of this existing surface water body to increase surface water attenuation and biodiversity properties.

4.1.11 Detailed design will be required to confirm the feasibility of the strategy and whether a site wide gravity system is achievable. The specific drainage infrastructure to be implemented will be confirmed during the detailed design stage following discussion with all relevant parties. Consents for works to the onsite surface water body will be required from the landowner. Early investigations into this surface water body will be needed to be undertaken to identify any additional capacity constraints. This report is to support the proposed planning application. Full approval for the proposed drainage strategy will need to be sought from the SuDS Approval Body (Wrexham County Borough Council) separately by the developer in due course.

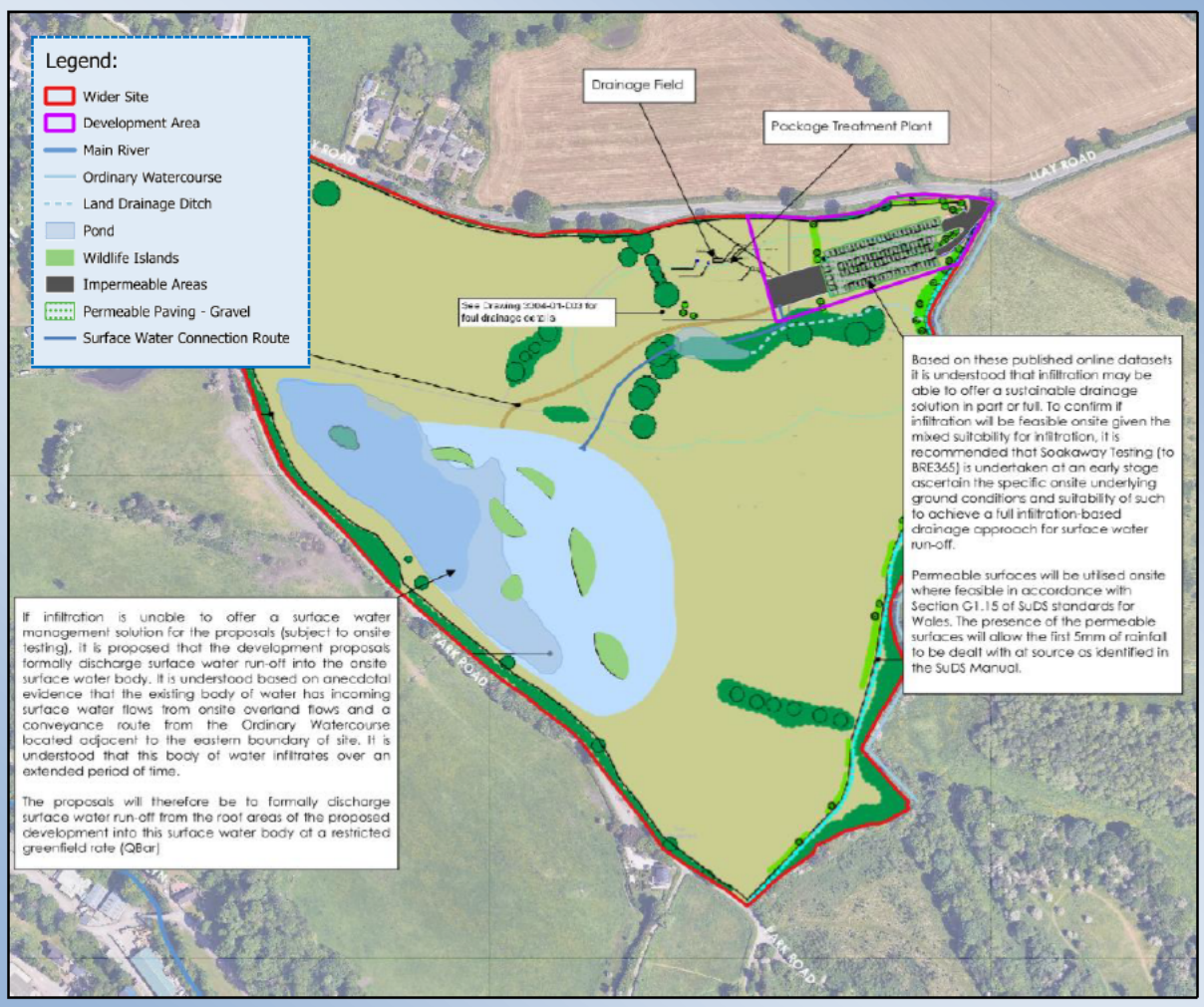



*Figure 3: Proposed Drainage Strategy Plan Extract (Betts Hydro, 2025)*

*This drawing is not a drainage 'design' it is a plan showing the preliminary drainage strategy.*

*Proposed Discharge Rates*

4.1.12 In accordance with the SuDS Standards for Wales (2018) all sites should endeavour to achieve as close to pre-development greenfield rates as is viable. Based on the nature and the size of the development, the pre-development greenfield rate (QBar) is calculated to be 3.4l/s (see calculations in **Appendix I**). Restricting the rate of discharge will generate a requirement to provide onsite stormwater storage for the extreme rainfall events. The stormwater storage figures for the site have been included within **Appendix I**. The surface water scheme for the development will be designed to cater for the surface water run-off generated in storm events up to and including the 1 in 100yr return period with allowance for climate change.

***Priority Level 4: Surface water runoff is discharged to a surface water sewer, highway drain, or another drainage system.***

4.1.13 Review of Welsh Water's sewer records show there are no public surface water sewers or highway drains in proximity for the site to discharge into. Furthermore, there are no proposals to connect into a surface water sewer, highway drain, or another drainage system, due to more primary drainage options being identified as feasible onsite.

***Priority Level 5: Surface water runoff is discharged to a combined sewer.***

4.1.14 As previously discussed, review of Welsh Water's sewer records show there are no public surface water sewers in proximity for the site to discharge into. Furthermore, there are no proposals to connect into a surface water sewer, highway drain, or another drainage system, due to more primary drainage options being identified as feasible onsite.

## 4.2 Standard 2 – Surface Water Run-Off Hydraulic Control

4.2.1 This Standard applies to discharges to surface water bodies, surface water sewers or combined sewerage systems. Should infiltration be identified as not feasible onsite (subject to testing), the proposals are to discharge surface water run-off from the site into the onsite surface water body located adjacent to the western boundary of the wider site. Appropriate detailed design will ensure no increased flood risk will result from the proposals when climate changes are considered in the future.

4.2.2 The specific drainage infrastructure to be implemented will be confirmed during the detailed design stage following discussion with all relevant parties. The proposed onsite attenuation will be sized to contain up to and including the 1 in 100yr return period storm event with a 40% allowance for climate change. The site will discharge at a restricted greenfield rate controlled by a flow control device. Furthermore, all permeable surfaces will comply to standards set out in the SuDS Manual as discussed further in Section 4.6.

## 4.3 Standard 3 – Water Quality

4.3.1 The proposed drainage regime will look to address the design requirement associated with Water Quality in multiple ways. The key being the incorporation of multiple stages of water treatment prior to discharge from the site. Where feasible permeable surfaces will be considered to provide water quality improvements from filtration. Furthermore, as part of the development, areas of the wider site will be utilised as a tree farm for coniferous firs. It is understood that these trees will reduce soil and water movement by increasing water infiltration rates and slowing the flow of transported sediments. By trapping pollutants bound to soil particles, these trees will help reduce water pollutants from entering the onsite surface water body.

4.3.2 The proposed attenuation will be designed in accordance with the guidance and practice in the SuDS Manual, to ensure it provides an additional source of water quality treatment prior to flows leaving the site. As discussed, Planting will also be considered where appropriate to provide additional benefits for any run-off entering these SuDS features.

## 4.4 Standard 4 – Amenity

4.4.1 The developer will consider the use of external rainwater butts on the proposed building and gravelled vehicle access. As the proposed development is for the construction of a commercial building with an area to house reindeer, the majority of the wider site will remain undeveloped for grazing land for the deer. As part of the development the proposals are to increase the size of the existing onsite waterbody and use any

excavated material to create small islands for wildlife, as illustrated within **Figure 2**. The proposed tree farm will also provide amenity to the site by softening the surrounding urban environment.

## 4.5 Standard 5 – Biodiversity

4.5.1 The proposed drainage regime will look to address the design requirements associated with biodiversity by ensuring green open space onsite. As previously discussed, the proposed development is for the construction of a commercial building with an area to house reindeer, the majority of the wider site will remain undeveloped for grazing land for the deer. As part of the development the proposals are to increase the size of the existing onsite waterbody and use any excavated material to create small islands for wildlife therefore increasing the amount of land which can be used for biodiversity post-development. The proposed tree farm will also provide biodiversity for wildlife overing a degree of protection and assist in helping prevent Climate Change by providing a level of carbon absorption to the surrounding area.

4.5.2 Furthermore, the proposed permeable surfacing on the car parking and access route will be designed to promote the maximum benefits in terms of biodiversity. Any additional planting proposed will be native to the area and provide benefits to natural and local ecosystems, the specific design and criteria will be confirmed during detailed design, in conjunction with an appropriate ecologist.

## 4.6 Standard 6 - Design of Drainage for Construction, Operation and Maintenance

4.6.1 From January 2019, all new developments of at least 2 properties or over 100m² in Wales will be required to have Sustainable Drainage Systems (SuDS) to manage surface water run-off generated by the proposals. These SuDS must be designed and constructed in accordance with the Welsh Government SuDS standards for Wales guidance and Schedule 3 of the Flood and Water Management Act 2010 (FWMA), which establishes WCBC as a SuDS Approval Board (SAB).

4.6.2 The SAB have statutory responsibility for approving and where appropriate adopting the proposed drainage systems on new developments. The SAB application is undertaken separately to the planning permissions and developers are required to obtain both planning approval and SAB approval prior to commencement of any proposed construction works.

### *Permeable Surfaces*

4.6.3 Permeable surfaces will be utilised onsite where feasible in accordance with Section G1.15 of SuDS standards for Wales. The presence of the permeable surfaces will allow the first 5mm of rainfall to be dealt with at source as identified in the SuDS Manual (**Appendix K** for full details).

4.6.4 An extract from the SuDS Manual has been included within **Appendix K** identifying the design guidance for the different types of permeable surfacing that has been identified as one of the primary options for handling surface water runoff from site.

### *Maintenance*

4.6.5 Regular inspection and maintenance are important for the effective operation of SuDS. The property owner should be inspecting any assets regularly, preferably during and after heavy rainfall to check effective operation.

4.6.6 Maintenance activities can be broadly defined as: 1) regular, 2) occasional and 3) remedial maintenance. It is proposed that maintenance regime for permeable paving follows table 20.15 in the CIRIA 753 SuDS Manual guidance (**Appendix K**). Maintenance of shared permeable surfaces (permeable paved access roads and parking areas) however can be arranged through appointment of a site management company.

## 4.7 Climate Change

4.7.1 There are significant indications that the UK climate is changing; the nature of this change will vary based on regional and catchment differences, consensus is that effects will become more pronounced over the coming decades. With reference to TAN15 the most likely effects to be experienced within Wales are:

- Increases in sea levels.
- Greater inflow into estuaries and the sea
- Significant changes in rainfall patterns seasonally
- Increased evapotranspiration

4.7.2 Making 'provisions' for these anticipated future changes to flood risk is an important action, ensuring future 'sustainable development' within Wales as identified within TAN15; Section 2.1. Current expert opinion indicates the likelihood of more frequent short duration and high intensity rainfall events and the addition of more frequent periods of long duration rainfall meaning future flooding events will have a greater impact on the environment and society.

4.7.3 Furthermore, in accordance with SuDS Standards for Wales; Section G2.5 the proposed SuDS methods will be used to support development resilience to climate change by reducing the risk of localised surface water flooding, mitigating pollution that may arise from surface water runoff and helping to safeguard water supplies. The development proposals also take account of likely future pressures on flood risk, the environment and water resources such as climate change and urban creep.

4.7.4 Any increase in the level of flood risk to the potential development from Climate Change is likely to be related to the increase in rainfall intensity and duration and its impact upon the surface water drainage system. Climate Change will therefore be accounted for within the design with an increase in peak rainfall intensity of 40%.

## 4.8 Foul Water Management

4.8.1 At present there are no foul water flows generated by site and no public sewers located in proximity to the development (see sewer records in **Appendix C**). As part of the proposals, 2no. permanent visitor toilets (one disabled) are proposed. These include 2no. wash hand basins. This is in addition to the single staff toilet, wash hand basin and kitchen sink.

4.8.2 A Technical Note has been prepared, which details the planning context for the foul water drainage proposals. This has been included within **Appendix L** for completeness; however, the revised proposals have been summarised subsequently.

4.8.3 The site is between 900m and 1km from the nearest public sewers and any connection would require a private pumping station, private rising main >900m laid within public highway, washout chambers and air admittance valves and ejection chamber and >10m 150mm dia. gravity sewer length; surge analysis would also be required. Construction cost estimates exceed £100k and would not be commensurate with the scale and nature of the proposals. There would also be technical constraints such as septicity due to the length of the rising main and the very low flows.

4.8.4 The foul water flows will be treated by a Package Treatment Plant and then discharged to ground via a Drainage Field in accordance with Building Regulations Approved Document H – *Drainage and waste disposal* and British Standard (BS 6297:2007+A1:2008).

4.8.5 The proposals are in accordance with Welsh Circular 008/2018 *Planning requirement in respect of the use of private sewerage in new development, incorporating septic tanks and small sewage treatment plants*.

4.8.6 There was an erroneous concern when the application went to committee that the drainage field might be within 200m of another drainage field, however it was demonstrated that the drainage field is >310m from the nearest drainage field following investigations. It should also be noted that NRW's guidance on the proximity allowance without further assessment working being undertaken has now reduced to 50m.

4.8.7 The proposed volume of treated water discharge to ground is less than 2cu.m/day and as a result can be screened out in terms of the potential impact on the SAC from Phosphates in accordance with NRW guidance which states: "*Where private treatment systems can be properly justified, small discharges to ground (<2m3/day) via a suitable drainage field, built in accordance with criteria set out in this advice, are preferred over direct discharges to watercourses as they are considered unlikely to have a pathway for phosphorus to enter the river environment and unlikely to have a significant effect on an SAC.*"

4.8.8 Due the variable foul water flows throughout the week and with greater peak loadings during the event weekends, it is proposed that a holding tank be used to trickle-feed the package treatment plant. This allows the PTP to be fed sufficiently to maintain the necessary biological treatment, it also allows the maximum volume of discharge to be constrained to no greater than 2cu.m/day without constraining visitor numbers.

4.8.9 Kee Process have been engaged to provide a bespoke solution with the specifications contained with the drainage management strategy report, and they have provided such for the BioDisc, flow splitter, and primary tank (see product specifications within **Appendix M**). The pump set up and final splitter chamber are to be confirmed at the detailed design stage. It is anticipated that a planning condition for the detailed drainage design will be required.

## 5.0 SUMMARY AND CONCLUSIONS

5.1 This assessment has been prepared to support a planning application for development located off Llay Road in Cefn-y-Bedd (Wrexham). The proposals are for the construction of a commercial building to provide an office, maintenance facility, hay/straw storage and sick/maternity bay for reindeer. The wider site will also be used as a tree farm for Christmas Trees. The proposals will be complete with access, cark parking, boundary fencing and drainage.

5.2 In order for the development proposals to be justified in line with the guidance set out in SuDS Standards for Wales, new development must not increase flood risk elsewhere and where possible offer improvement on the pre-development situation. The sustainable drainage hierarchy has been considered in accordance with the Welsh SuDS Standards, which look to deal with surface water run-off as close to source as is practical.

5.3 Based on these published online datasets it is understood that infiltration may be able to offer a sustainable drainage solution in part or full. To confirm if infiltration will be feasible onsite given the mixed suitability for infiltration, it is recommended that Soakaway Testing (to BRE365) is undertaken at an early stage ascertain the specific onsite underlying ground conditions and suitability of such to achieve a full infiltration-based drainage approach for surface water run-off.

5.4 Discharge rates are limited by the rate of infiltration; it is therefore recommended that the chosen infiltration-based discharge method(s) are designed to BRE365 standards in accordance with the CIRIA SuDS Manual. Discussion with Wrexham County Borough Council and Welsh Water will also be required to ensure that the proposed infiltration methods conform to their design requirements.

5.5 If infiltration is unable to offer a surface water management solution for the proposals (subject to onsite testing), it is proposed that the development proposals formally discharge surface water run-off into the onsite surface water body. Review of the mapping had identified the presence of a large body of water located adjacent to the western boundary of the wider site area.

5.6 It is understood based on anecdotal evidence that the existing body of water has incoming surface water flows from onsite overland flows and a conveyance route from the Ordinary Watercourse located adjacent to the eastern boundary of site. It is understood that this body of water infiltrates over an extended period of time.

5.7 The proposals will therefore be to formally discharge surface water run-off from the roof areas of the proposed development into this surface water body at a restrict greenfield rate (QBar). The proposals are also to increase the size of this existing surface water body to increase surface water attenuation and biodiversity properties.

5.8 Detailed design will be required to confirm the feasibility of the strategy and whether a site wide gravity system is achievable. The specific drainage infrastructure to be implemented will be confirmed during the detailed design stage following discussion with all relevant parties. Consents for works to the onsite surface water body will be

required from the landowner. Early investigations into this surface water body will be needed to be undertaken to identify any additional capacity constraints.

5.9 In accordance with the SuDS Standards for Wales (2018) all sites should endeavour to achieve as close to pre-development greenfield rates as is viable. Based on the nature and the size of the development, the pre-development greenfield rate (QBar) is calculated to be 3.4l/s. Restricting the rate of discharge will generate a requirement to provide onsite stormwater storage for the extreme rainfall events. The surface water scheme for the development will be designed to cater for the surface water run-off generated in storm events up to and including the 1 in 100yr return period with allowance for climate change. This report is to support the proposed planning application. Full approval for the proposed drainage strategy will need to be sought from the SuDS Approval Body (Wrexham County Borough Council) separately by the developer in due course.

5.10 This Drainage Management Strategy is commensurate with the site and in summary, the development can be considered appropriate in accordance with Welsh Governments Statutory Standards for Sustainable Drainage Systems, providing the mitigation measures proposed within are included within the development proposals.

## 6.0 RECOMMENDATIONS

6.1 The development parcels are located wholly within Flood Zone 1 and are at little risk of fluvial/tidal flooding. To observe a conservative approach however, mitigation measures have been proposed below to safeguard against other potential residual sources of flood risk. The mitigation measures also consider the uncertainties of climate change in accordance with the revised TAN15.

6.2 For 'less vulnerable' development located within Flood Zone 1, it is typical to set the Finished Floor Levels (FFL) of proposed buildings a minimum of 150mm above the existing ground levels. By ensuring the FFLs are raised sufficiently above the external levels (following any re-grade) should mitigate any risk of flooding from a variety of sources, including groundwater and surface water risks.

6.3 Any overland flows generated by the development must be carefully controlled and safe avenues directing overland flows way from any proposed properties is advised. Any natural conveyance routes should be maintained through the site, where practical. Where this is not practical then provision will need to be made to intercept and convey flows safely through the proposals to outfall as they would naturally.

6.4 The site walkover confirmed the presence of an unnamed Ordinary Watercourse located adjacent to the eastern boundary of site, identified to be routed into the site via a land drainage ditch. It is recommended that further investigation is undertaken to understand the exact condition, capacity and routing of the watercourses and waterbodies located onsite.

6.5 All new developments of at least 2 properties or over 100m² in Wales will be required to have Sustainable Drainage Systems (SuDS) to manage surface water run-off generated by the proposals. These SuDS must be designed and constructed in accordance with the Welsh Government standards for sustainable drainage. The SAB have statutory responsibility for approving and where appropriate adopting the proposed drainage systems on new developments.

6.6 To minimise the flood risk to the neighbouring properties and conform to the guidance set out in TAN15, it is proposed that surface water run-off be managed effectively and sustainably in accordance with best practice and standard guidance. It is recommended that the peak rates of surface water run-off generated by the proposals be restricted to the equivalent of the pre-development greenfield situation.

6.7 The proposed onsite surface water drainage system will need to be sized to contain the 1 in 30yr return period event below ground with exceedance from storm events up to and including the 1 in 100yr return period storm event with a 40% allowance for climate change being contained onsite.

6.8 As with any drainage system, blockages within either the foul or surface water system have the potential to cause flooding or disruption. It is important that should any drainage systems not be offered for adoption to either the Water Company or the Local Authority then an appropriate maintenance regime should be scheduled with a suitably qualified management company for these private drainage systems.

## BIBLIOGRAPHY & REFERENCES

Adapting to Climate Change: Advice for Flood and Coastal Erosion Risk Management Authorities – Environment Agency/DEFRA 2016
CIRIA 522: Sustainable urban drainage systems – design manual for England and Wales (2000).
CIRIA 523: Sustainable urban drainage systems – best practice manual (2001).
CIRIA 609: Sustainable drainage systems. Hydraulic, structural and water quality advice (2004).
CIRIA 624: Development and flood risk – guidance for the construction industry (2004).
CIRIA 635: Designing for Exceedance in urban drainage: Good practice (2006).
CIRIA 644: Building Greener (2007).
CIRIA 753: The SUDS manual (2015).
Flood Risk to People – Phase 2 (FD2321/TR2), DEFRA and the Environment Agency (2006).
Flood estimation for small catchments: Institute of Hydrology Report No.124, NERC (1994).
Flood Estimation Handbook, Centre for Ecology and Hydrology (1999).
Planning Policy Statement 25: Development and Flood Risk (2006).
Sewers for Adoption 7th Edition, WRc (2012).

### Web-based References

Bingmaps – http://www.bing.com/Maps/
British Geological Survey – http://www.bgs.ac.uk/opengeoscience/home.html
Chronology of British Hydrological Events – www.dundee.ac.uk/
CIRIA – http://www.ciria.org/
Cranfield University – http://www.landis.org.uk/soilscapes/
FloodProBE – http://www.floodprobe.eu/
Flood Forum – http://www.floodforum.org.uk/
Flood London – http://www.floodlondon.com/
Flood Resilience Group – http://www.floodresiliencegroup.org/frg/
Google Maps – http://maps.google.co.uk/
Natural Resources Wales – https://naturalresources.wales/?lang=en
Streetmap – http://www.streetmap.co.uk/
US Army Corps of Engineers – http://www.hec.usace.army.mil/software/hec-ras/
Watertight International – http://www.watertightinternational.com/
Welsh Water - http://www.dwrcymru.com/

This page has been intentionally left blank

# APPENDIX A: SuDS STANDARDS FOR WALES EXTRACTS

This page has been left intentionally blank

## Early design thinking to deliver multifunctional spaces and effective drainage for phased development

Drainage systems should be considered at the earliest stages of site design to influence the layout of the roads, buildings and public open spaces. Planning of a new site layout should be informed by the topography and the requirements of surface water management systems to both effectively drain and treat the runoff. Any existing watercourses, ditches, and other drainage features both within and adjoining the site should help inform proposals. By doing so, biodiversity, amenity and cost effectiveness can be maximised through using areas of land for a range of multifunctional purposes in addition to surface water management e.g. landscaping, car parking, recreational areas, rainwater harvesting etc. Early conceptual design will require that infiltration tests are also undertaken early to inform the conceptual design of the drainage system.

Where a development is phased, the design of the SuDS scheme should consider the effects of each stage as well the whole development on the performance of the surface water drainage system.

Development design should take account of existing flood risk policies in the Local Flood Risk Management Strategy, any flood consequence assessments, surface water management plans, the catchment flood management plan and the river basin management plan (see Section 4, Regulatory Framework). It should also take account of any relevant local planning documents.

## How the National Standards work

To assist in understanding the basis for the required Standards to be complied with, there is an introductory **Principles** section. There are two types of Standards. Standard S1 is a **Hierarchy Standard** while S2 to S6 are **Fixed Standards.**

- **Principles** for SuDS drainage design explain the objectives for applying the Standards;
- The **Hierarchy Standard** gives criteria for prioritising the choice of runoff destination (Standard S1);
- **Fixed Standards** (Standards S2 to 6) give:
    - Design Standards which state the minimum design criteria that all SuDS should satisfy; and
    - Standards which state how SuDS should be built, maintained and operated.

The SuDS Standards are aimed at ensuring that the most effective drainage scheme is delivered for protecting and enhancing both the natural and built environment.

Standard S1 comprises 5 Levels with the most preferred level represented by Level 1, and movement from Level 1 to lower levels determined by demonstration that the exception criteria apply. Level 1 should be met to the maximum extent possible, with lower levels used where required and where appropriate justification can be provided. Different levels may be suitable for different parts of a site, and more than one level may be required to effectively drain the site to meet the requirements of the Standards.

Fixed Standards S2 to S6 do not have exception criteria and prioritised levels. They specify all the criteria that need to be met in order to show compliance to the Standards.

**Links with the planning system**

Developers should demonstrate compliance with these standards in submitting planning applications. For major developments, where a drainage strategy document may be required as part of a local validation requirement, this should demonstrate how these standards have been met in the site design.

It should be noted that a number of planning authorities in Wales have adopted guidance on sustainable drainage which should be taken into account in any development proposal.

**Glossary**

Note that Section 5 contains a glossary which aims to explain and clarify any unfamiliar terms or specialist words used in this document.

# 3. Standards

## Standard S1 – Surface water runoff destination

*This Standard addresses the use of surface water by the development and where it should be discharged. The aim is to ensure that runoff is treated as a resource and managed in a way that minimises negative impact of the development on flood risk, the morphology and water quality of receiving waters and the associated ecology. This will ensure that early consideration is given to the use of rainwater harvesting systems to both manage runoff and deliver a source of non-potable water for the site where practical. Where it is not, prioritisation should be given to infiltration. Discharges to sewerage systems must be limited where possible.*

### S1 Surface water runoff destination

Priority Level 1: Surface water runoff is collected for use;

Priority Level 2: Surface water runoff is infiltrated to ground;

Priority Level 3: Surface water runoff is discharged to a surface water body;

Priority Level 4: Surface water runoff 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.

Note that Priority Levels 1 is the preferred (highest priority) and that 4 and 5 should only be used in exceptional circumstances.

## Guidance on Standard S1 – Surface water runoff destination

G1.1 As much of the runoff as possible (subject to technical or cost constraints) should be discharged to each destination before a lower priority destination (level) is considered.

G1.2 Depending on the site characteristics, drainage from different parts of the site could have different drainage destinations.

G1.38 Provision should be made for separation and removal of sediments and oils before connection to a combined sewer.

G1.39 The possibility of the developer funding disconnection of surface water entering the combined sewer at locations either upstream or downstream of the site connection should be investigated with the sewerage undertaker and the local authority to mitigate the impact of the runoff into the sewer from the development.

## Standard S2 – Surface water runoff hydraulic control

*The aim of Standard S2 is to manage the surface water runoff from and on a site to protect people on the site from flooding from the drainage system for events up to a suitable return period, to mitigate any increased flood risk to people and property downstream of the site as a result of the development, and to protect the receiving water body from morphological damage.*

### S2 Surface water runoff hydraulic control

1) Surface water should be managed to prevent, so far as possible, any discharge from the site for the majority of rainfall events of less than 5mm.
2) The surface water runoff rate for the 1 in 1 year return period event (or agreed equivalent) should be controlled to help mitigate the negative impacts of the development runoff on the morphology and associated ecology of the receiving surface water bodies.
3) The surface water runoff (rate and volume) for the 1% (1 in 100 year) return period event (or agreed equivalent) should be controlled to help mitigate negative impacts of the development on flood risk in the receiving water body.
4) The surface water runoff for events up to the 1% (1 in 100 year) return period (or agreed equivalent) should be managed to protect people and property on and adjacent to the site from flooding from the drainage system.
5) The risks (both on site and off site) associated with the surface water runoff for events greater than the 1% (1 in 100 year) return period should be considered. Where the consequences are excessive in terms of social disruption, damage or risk to life, mitigating proposals should be developed to reduce these impacts.
6) Drainage design proposals should be examined for the likelihood and consequences of any potential failure scenarios (e.g. structural failure or

## Standard S3 - Water Quality

*Standard S3 addresses the drainage design requirements to minimise the potential pollution risk posed by the surface water runoff to the receiving water body.*

### S3 Surface water quality management

Treatment for surface water runoff should be provided to prevent negative impacts on the receiving water quality and/or protect downstream drainage systems, including sewers.

## Guidance on Standard S3 - Water Quality

G3.1 Runoff from roads, commercial and other urban environments can, in particular, contain grit, sediments, oils and poly-aromatic hydrocarbons (PAHs), metals, and dissolved salts – each of which has the potential to cause pollution of receiving surface water or groundwater. SuDS can be effective at reducing a wide range of these pollutants through enabling sedimentation, filtration and a range of photolytic, chemical and biological processes.

G3.2 This Section provides guidance on Standard S3, which aims to ensure SuDS effectively manage sediment and other pollutants, ensuring discharges from the systems are of an acceptable quality and will not cause a pollution risk.

G3.3 The effective management of surface water runoff is essential, even if the receiving water body is already polluted. Consideration should be given to supporting current or future quality objectives for the water body over the lifetime of the development.

G3.4 The effectiveness of components in improving water quality is strongly linked to the reduction in the volume of runoff. Well-designed SuDS, designing for water quality management, should maximise volume reduction when designing conveyance and attenuation measures, preferably using vegetated, surface-based systems.

G3.5 This guidance does not supersede the requirements of the Water Framework and Groundwater Directives, but provides options for compliance in line with Natural Resources Wales advice.

# Standard S4 - Amenity

*Standard S4 addresses the design of SuDS components to ensure that, where possible, they enhance the provision of high quality, attractive public space which can help provide health and wellbeing benefits, they improve liveability for local communities and they contribute to improving the climate resilience of new developments.*

## S4 - Amenity

The design of the surface water management system should maximise amenity benefits.

# Guidance on Standard S4 - Amenity

G4.1 The aim of standard S4 is to ensure that, wherever possible, and having regard to the need to prioritise infiltration drainage and rainwater harvesting (Standard S.1), the SuDS scheme makes the best contribution to development design by maximising benefits for amenity as well as for biodiversity, water quantity and quality.

G4.2 It is likely that multiple components will be required, linked in series across the site, to achieve a SuDS scheme that integrates well with the environment of a new development. Keeping water at or close to the ground surface will help to promote amenity benefits. Managing runoff at source will promote the use of smaller, distributed features, rather than large retention or detention features which are often inappropriate.

G4.3 A key aim for sustainable drainage is to provide an improved local environment which integrates the surface water drainage function with open space, providing amenity and recreation opportunities where possible. Examples of successful schemes in the UK and abroad are available[24]. This Section (and Section 5 Biodiversity standard) provides guidance on how to ensure that SuDS can work for people and nature. This section shows how SuDS can add amenity value by contributing towards:

- making sites pleasant places to live or work;
- reducing hazards from climate change;
- creation of amenity space - contributing to green space accessibility standards; and
- promoting the well-being of site users.

[24] www.susdrain.org

# Standard S5 - Biodiversity

*Standard S5 addresses the design of SuDS to ensure, where possible, they create ecologically rich green and blue corridors in developments and enrich biodiversity value by linking networks of habitats and ecosystems together. Biodiversity should be considered at the early design stage of a development to ensure the potential benefits are maximised.*

## S5 - Biodiversity

The design of the surface water management system should maximise biodiversity benefits.

## Guidance on Standard S5 - Biodiversity

G5.1 The aim of standard S5 is to ensure that, wherever possible, and having regard to the need to prioritise infiltration drainage and rainwater harvesting, the SuDS scheme makes the best use of a site to maximise benefits for biodiversity, as well as for amenity, water quantity and quality. Biodiversity benefits will usually be best achieved by drainage systems which are on the surface and visible with vegetated components, forming part of the local green infrastructure and local ecosystem structure. It is important to ensure that the SuDS design does not damage existing sensitive habitats. Amenity is addressed by Standard S4.

G5.2 The provision of biodiversity enhancement in developments is a requirement of Planning Policy Wales and Technical Advice Note (TAN) 5[28].

G5.3 A key aim for sustainable drainage is to provide an improved local environment which integrates the surface water drainage function with open space providing habitat opportunities where possible. This Standard and Standard 4 (Amenity) provide guidance on how to ensure that SuDS can work for people and nature. SuDS can add biodiversity value by:

- Supporting and promoting natural local habitat and species,
- Contributing to the delivery of local biodiversity objectives,
- Contributing to habitat connectivity, delivering wider biodiversity benefits,
- Creating diverse, self-sustaining, resilient local ecosystems.

[28] TAN 5 Nature Conservation and Development
http://gov.wales/topics/planning/policy/tans/tan5/?lang=en

# Standard S6 – Design of drainage for Construction, Operation and Maintenance and Structural Integrity

*Standard S6 deals with designing robust surface water drainage systems so they can be easily and safely constructed, maintained and operated, taking account of the need to minimise negative impacts on the environment and natural resources.*

## S6 – Design of drainage for Construction, Operation and Maintenance

1) All elements of the surface water drainage system should be designed so that they can be constructed easily, safely, cost-effectively, in a timely manner, and with the aim of minimising the use of scarce resources and embedded carbon (energy).

2) All elements of the surface water drainage system should be designed to ensure maintenance and operation can be undertaken (by the relevant responsible body) easily, safely, cost-effectively, in a timely manner, and with the aim of minimising the use of scarce resources and embedded carbon (energy).

3) The surface water drainage system should be designed to ensure structural integrity of all elements under anticipated loading conditions over the design life of the development site, taking into account the requirement for reasonable levels of maintenance.

# Guidance on Standard S6 – Design of drainage for Construction, Operation and Maintenance

### Construction

G6. 1 The design should take full account of the method of construction, including any specific programming requirements, to minimise the potential for poor construction of any drainage component. For phased developments, the design should indicate how SuDS features will be managed, protected and commissioned, especially where their use may change through the construction programme. The SuDS Manual includes detailed guidance on planning a SuDS scheme.

G6.2 The Construction (Design and Management) Regulations 2015 include requirements for designers to take account of the health and safety risks

This page has been intentionally left blank

# APPENDIX B: NRW CORRESPONDENCE & FLOOD MAPPING

This page has been left intentionally blank

## Hannah Buchanan

**From:** Data Distribution <datadistribution@cyfoethnaturiolcymru.gov.uk>
**Sent:** 11 October 2021 14:13
**To:** Hannah Buchanan
**Subject:** ATI22214a P5&6, Land at Cefyn-y-Beth, Wrexham, LL12 9UG

Dear Ms Buchanan,

Further to your recent request concerning the above, please note that we do not have any detailed models for this location.

**Self Service Open Data:**

You can now make the most of open data provided **free online:**

- **NRW Flood Risk Map Viewer**: create and export an A4 or A3 PDF map at a scale of 1:5000. You will find many spatial risk layers, including the Development Advice Map, flood zones, surface water, reservoir hazard data and historic flooding.

- **"Lle" the Welsh Government Portal for Open Spatial data**: Spatial data is free to download, view and use within your own GIS system. The flood datasets includes Flood Zones, Flood Defences, Historic Flood Outlines, Areas Benefiting Defences, Surface Water, Development Advice Map, and LiDAR Composite Dataset. You can also download the 'Coastal Design – Extreme Sea Levels' report and data covering still water levels for the Welsh Coastline (wave overtopping is **not** calculated).

**Please Note the Following:**

- All information supplied will need to be verified by the recipient **PRIOR** to using in a Flood Consequences Assessment (FCA). We would expect to see a review of hydrology, in-channel survey, floodplain topography etc. to demonstrate the data is suitable for the purposes of producing an FCA.

- As of 1st of December, 2016 you will need to apply climate change allowances carefully to ensure compliance with Welsh Government climate change allowances and flood consequence assessments.

- **Pre-application Advice:** NRW are changing the way in which we provide advice to developers. We will continue to meet our duties as an adviser. In addition, we will offer a free initial opinion on your proposal. However, in cases where you would like to access any extra advice that falls outside of our statutory duties, we can only offer this as part of our Discretionary Planning Advice Service (DPA Service). For more information regarding free service and our discretionary planning can be found in the following links: Welsh Version / English version.

Your request for our free or charged discretionary advice service needs to be accompanied by the relevant 'Request Form' which is available to download from our website. You will then need to send the form to northplanning@cyfoethnaturiolcymru.gov.uk who will coordinate our response.

Apologies we could not have been of any further assistance to you on this occasion.

Yn gywir / Yours sincerely,

**Michelle Lewis**

Cyfoeth Naturiol Cymru / Natural Resources Wales
Ffôn/ Phone: 03000 653577
Symudol / Mobile: 07917243096
Office Location Llys Afon, Hwlffordd / Office Location River Court, Haverfordwest
Cwsmer, Cyfarthrebu a Masnach - Customer, Communications and Commercial

Oriau gwaith arferol/Normal working hours – Mon-Fri, 9 to 5

**Yn falch o arwain y ffordd at ddyfodol gwell i Gymru trwy reoli'r amgylchedd ac adnoddau naturiol yn gynaliadwy.**

**Proud to be leading the way to a better future for Wales by managing the environment and natural resources sustainably.**

cyfoethnaturiol.cymru / naturalresources.wales

Twitter | Facebook | LinkedIn | Instagram

---

**From:** Hannah Buchanan <hannahbuchanan@betts-associates.co.uk>
**Sent:** 15 September 2021 17:03
**To:** Data Distribution <datadistribution@cyfoethnaturiolcymru.gov.uk>
**Subject:** Flood Risk Information Request

To whom it may concern,

**Land at Cefyn-y-Beth, Wrexham, LL12 9UG**

Please could you confirm whether you have any information that you feel would be valuable to a Flood Risk Assessment and Drainage Management Strategy for the above site (location plan attached), including details of historical flooding and any predicted flood water levels; this would be greatly appreciated. If there are any specific requirements that you require in a scope of works for this site, please can you advise at this stage so that it can be fully incorporated into the proposals at an early stage.

Please do not hesitate to contact me on the details below to discuss further should you require additional information or clarification.

Kind Regards,

**Hannah Buchanan** *BSc (Hons)*
*Graduate Flood Risk Analyst*

**BETTS HYDRO**
*Consulting Engineers*

Old Marsh Farm Barns, Welsh Road, Sealand, Flintshire, CH5 2LY
Chester +44 (0)1244 289041

hannahbuchanan@betts-associates.co.uk
www.betts-associates.co.uk

CIVIL | STRUCTURAL | GEO-ENVIRONMENTAL | HYDROLOGY | FLOOD RISK MANAGEMENT
SUDS | STRUCTURAL SURVEYS | PARTY WALL DUTIES | INFILTRATION | GEOTECHNICAL

***ELECTRONICALLY TRANSMITTED INFORMATION***
*This electronic transmission is strictly confidential and intended solely for the addressee. It may contain information which is covered by legal, professional or other privilege. If you are not the intended addressee, you must not disclose, copy or take any action in reliance of this transmission. If you have received this transmission in error, please notify us as soon as possible. All emails transmitted by Betts Associates, Betts Geo or Betts Hydro are virus checked. This does not guarantee that transmissions are virus free. Reference should always be made to the hard copy of any electronically transmitted files. Electronic data does not constitute contract documentation. Use of the content of our files is at your own risk. You remain responsible for anything produced using all or part of the data supplied.*

**Please consider the environment before printing this email**

# APPENDIX C: WW SEWER CORRESPONDENCE

This page has been left intentionally blank

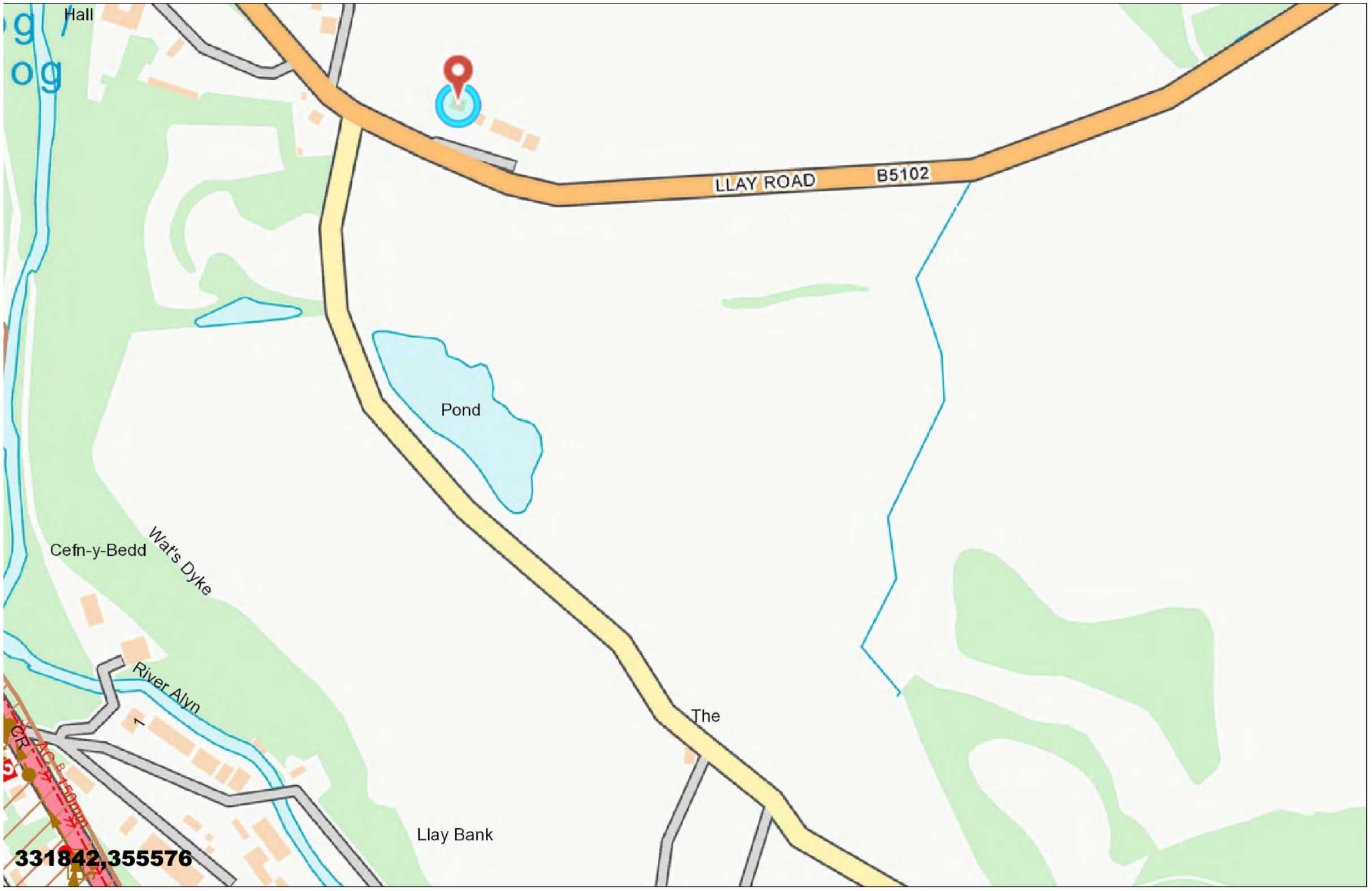
Dŵr Cymru
Welsh Water

# Land off Llay Road, Cefn-y-Bedd, Wrexham

N
W E
S

14/10/2021

**Scale: 1: 5000**




**LEGEND**

**Clean Water**

- Sluice Val
- Air Val, SINGLE
- Tap
- Pressure Reducing Valve
- Meter
- BULK Meter
- FH
- Cap
- Existing Main
- NON COMPANY

**Sewerage External**

- Foul
- Surface Water
- Combined
- Rising Main
- Private
- Treatment Works
- Pumping Station
- Special Purpose
- Unknown End
- Change, Combined Overflow
- Outfall, FOUL
- Lamp Hole, Foul
- Private Sewer Transfer
- Lateral Drain
- Inspection Chamber

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

**EXACT LOCATION OF ALL APPARATUS TO BE DETERMINED ON SITE**

Reproduced from the Ordnance Survey's maps with the permission of the Controller of Her Majesty's Stationary Office. Crown Copyright. Licence No: WU298565.

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

## Hannah Buchanan

**From:** Environmental Information Requests <EnvironmentalInformationRequests@dwrcymru.com>
**Sent:** 24 September 2021 09:38
**To:** Hannah Buchanan
**Subject:** Request for Information - Sewer Flood Risk Information

Our Reference: EIR/903/2021

Dear Ms Buchanan,

Request for Information

RE: Land at Cefyn-y-Beth, Wrexham, LL12 9UG

We write further to your request for information dated 16th September 2021, which we have been considering under the Environmental Information Regulations 2004.

We can confirm that we have reviewed our flooding database and we have no flooding history within the location or vicinity requested.

Turning to your query on specific drainage requirements, we have a dedicated Planning Team within our Developer Services function that can provide advice on the capacity in our infrastructure to accommodate new development.

Our pre-planning service will review the capacity available in our sewerage network, wastewater treatment works and clean water network to accommodate the flows/demand from a proposed development. It will also raise awareness of any of our assets crossing the site which will need to be factored into the layout of your development and provide general advice on surface water drainage.

An application for pre-planning advice can be submitted online via the following address https://developers.dwrcymru.com/en/applications/planning/pre-planning. If you wish to discuss in more detail our Planning Team are contactable on 08009172652 or alternatively by email developer.services@dwrcymru.com.

We hope that this response is clear. Should you have any questions, please contact us by email at EnvironmentalInformationRequests@dwrcymru.com.

If you are dissatisfied with the handling of your request, you have the right to ask for an internal review. Internal review requests should be submitted within 40 working days of the date of receipt of this response and should be addressed to Company Secretary, Linea, Fortran Road, St Mellons, Cardiff CF3 0LT

If you are not content with the outcome of the internal review, you have the right to apply directly to the Information Commissioner for a decision.

Yours sincerely,

*R.Stevens*

Dŵr Cymru Welsh Water

_____ Dwr Cymru Welsh Water is firmly committed to water conservation and promoting water efficiency. Please log on to our website www.dwrcymru.com/waterefficiency to find out how you can become water wise. Mae Dwr Cymru Welsh Water

This page has been intentionally left blank

# APPENDIX D: LLFA/LPA CORRESPONDENCE

This page has been left intentionally blank

## Hannah Buchanan

**From:** Hannah Buchanan
**Sent:** 15 September 2021 17:07
**To:** 'sab@wrexham.gov.uk'
**Subject:** Historic Flood Risk Information
**Attachments:** Location Plan.pdf

To whom it may concern,

**Land at Cefyn-y-Beth, Wrexham, LL12 9UG**

Please could you confirm whether you have any information that you feel would be valuable to a Flood Risk Assessment and Drainage Management Strategy for the above site (location plan attached), including details of historical flooding and any predicted flood water levels; this would be greatly appreciated. If there are any specific requirements that you require in a scope of works for this site, please can you advise at this stage so that it can be fully incorporated into the proposals at an early stage.

Please do not hesitate to contact me on the details below to discuss further should you require additional information or clarification.

Kind Regards,

**Hannah Buchanan** *BSc (Hons)*
*Graduate Flood Risk Analyst*

**BETTS HYDRO**
*Consulting Engineers*

Old Marsh Farm Barns, Welsh Road, Sealand, Flintshire, CH5 2LY
Chester +44 (0)1244 289041

hannahbuchanan@betts-associates.co.uk
www.betts-associates.co.uk

CIVIL | STRUCTURAL | GEO-ENVIRONMENTAL | HYDROLOGY | FLOOD RISK MANAGEMENT
SUDS | STRUCTURAL SURVEYS | PARTY WALL DUTIES | INFILTRATION | GEOTECHNICAL

***ELECTRONICALLY TRANSMITTED INFORMATION***
*This electronic transmission is strictly confidential and intended solely for the addressee. It may contain information which is covered by legal, professional or other privilege. If you are not the intended addressee, you must not disclose, copy or take any action in reliance of this transmission. If you have received this transmission in error, please notify us as soon as possible. All emails transmitted by Betts Associates, Betts Geo or Betts Hydro are virus checked. This does not guarantee that transmissions are virus free. Reference should always be made to the hard copy of any electronically transmitted files. Electronic data does not constitute contract documentation. Use of the content of our files is at your own risk. You remain responsible for anything produced using all or part of the data supplied.*

**Please consider the environment before printing this email**

# APPENDIX E: LOCATION PLAN

This page has been left intentionally blank

# LOCATION PLAN

Land at Cefn-y-Beth, Wrexham, LL12 9UG



| | |
|---|---|
| OS X (Eastings) | 331724 |
| OS Y (Northings) | 355636 |
| Nat Grid | SJ317556 / SJ3172455636 |
| Nearest Post Code | LL12 9UG |
| Lat (OSGB36) | N53:05:36 (53.09326230543045) |
| Long (OSGB36) | W3:01:11 (-3.0196803096816653) |
| Lat, Long (OSGB36) | 53.09326230543045, -3.0196803096816653 |
| Lat (WGS84) | N53:05:37 (53.09354523464698) |
| Long (WGS84) | W3:01:16 (-3.021011306649778) |
| Lat, Long (WGS84) | 53.09354523464698, -3.021011306649778 |

# APPENDIX F: TOPOGRAPHIC SURVEY

This page has been left intentionally blank




DO NOT SCALE

## Legend:

- Wider Site
- Development Area
- Topographic Fall
- Contours
- Main River
- Ordinary Watercourse
- Land Drainage Ditch
- Pond

| REV | DATE | BY | DESCRIPTION | CHK |
|---|---|---|---|---|
| B | 18/03/25 | HB | FINAL VERSION | RDN |
| A | 17/09/21 | HB | PRELIMINARY FOR ISSUE | MB |

DRAWING STATUS:

BETTS HYDRO
CONSULTING ENGINEERS
Unit 6, Old Marsh Farm Barns, Welsh Road, Sealand, Flintshire CH5 2LY
Tel: 01244 288178enquiries@betts-associates.co.uk

GOODWIN
PLANNING SERVICES

PROJECT:

LAND OFF LLAY ROAD
WREXHAM

TITLE:

ELEVATION PLAN

| DATE: | SCALE @ SIZE: | DRAWN: | CHECKED: |
|---|---|---|---|
| SEPT '21 | 1:2500@A3 | HB | RDN |

| PROJECT No: | DRAWING No: | REV: |
|---|---|---|
| HYD666 | 100 | A |

# APPENDIX G: PROPOSED PLANNING LAYOUT

This page has been left intentionally blank