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Wrexham Industrial Estate

Flood Consequences Assessment & Drainage Strategy

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Contents

1.0 Introduction 5
1.1 Project Background 5
1.2 Scope of Assessment 5
1.3 Proposed Development 5
2.0 Existing Site Details 6
2.1 History and Current Use 6
2.2 Existing Watercourses and Other Waterbodies 7
2.3 Existing Topography 7
2.4 Existing Drainage 8
2.5 Geology 8
3.0 Development and Flood Risk 9
3.1 Planning Policy Wales and Technical Advice Note 15 9
3.2 Form of Development 9
3.3 Vulnerability Classification 9
3.4 TAN 15 – Acceptability of Flood Consequences. 10
3.5 Statutory Standards and Guidance for Sustainable Drainage Systems (SuDS) 11
4.0 Hydrological Assessment 12
4.1 Flood Map for Planning 12
4.2 Flooding from Surface Water and Small Watercourses 12
4.3 Flooding from Rivers or the Sea 13
4.4 Historic Flooding 13
4.5 Flooding From Sewers 13
4.6 Flooding From Reservoirs, Canals and Artificial Sources 13
4.7 Groundwater Flooding 14
4.8 Overall Flood Risk and Development Suitability Assessment 14
5.0 Mitigation 16
5.1 Flooding from Surface Water and Small Watercourses 16
5.2 Surface Water Flooding from the site Mitigation 16
6.0 Sustainable Surface Water Drainage Strategy 18
6.1 Standard S1 – Surface Water Runoff Destination 18
6.2 Standard S2 – Surface Water Runoff Hydraulic Control 19
6.3 Standard S3 – Water Quality 20
6.4 Standard S4 – Amenity 23
6.5 Standard S5 – Biodiversity 23
6.6 Standard S6 – Design of Drainage for Construction, Operation and Maintenance and Structural Integrity 23
6.7 Nutrient Neutrality 23
7.0 Foul Water Drainage Strategy 24
8.0 Conclusions 25

Appendices

Appendix A Proposed Site Plan

Appendix B Topographical Survey

Appendix C Welsh Water Sewer Records

Appendix D NRW Flood Mapping

Appendix E Proposed Drainage Plans

Appendix F Proposed Drainage Calculations

1.0 Introduction

1.1 Project Background

Curtins has been appointed by Elite Onyx Properties (UK) to provide a Flood Consequences Assessment (FCA) and Drainage Strategy for the proposed development located at Wrexham Industrial Estate, Bryn Lane, Wrexham, LL13 9UT (X: 339463., Y: 350099.)

The report provides information on the nature of flood risk at the site and follows Government guidance regarding development and flood risk.

The report is based on currently available information and preliminary discussions.

Proposals contained or forming part of this report represent the proposed drainage strategy. Some amendments may be required during the detailed design phase. However, it is anticipated that these will be minor, and the overall drainage strategy will be retained. In the event of adjustments require a material deviation from the intent contained in this document, prior approval shall be obtained from the relevant authority in advance of commencing such works.

Where the proposed works to which this report refers are undertaken more than twelve months following the issue of this report, Curtins shall reserve the right to re-validate the findings and conclusions by undertaking appropriate further investigations at no cost to Curtins.

1.2 Scope of Assessment

The assessment is to be undertaken in accordance with the standing advice and requirements of Technical Advice Note 15 (Tan-15) as outlined in Planning Policy Wales (PPW)

The assessment will:

- Investigate all potential risks of flooding to the site,
- Consider the impact the development may have elsewhere with regards to flooding,
- Consider design proposals to mitigate any potential risk of flooding determined to be present; and
- Consider foul and surface water drainage proposals for the proposed development.

This Flood Consequence Assessment and Drainage Strategy reviews the following information:

- Natural Resources Wales Flood Mapping.
- Technical Advice Note 15 (Tan-15) dated 2004 and updated March 2025
- Welsh Water (DCWW) Sewer Records dated August 2021.
- Topographical Survey completed by Layer Surveys, dated Feb 2024.

1.3 Proposed Development

The proposals seek outline planning consent for up to 15,000sqm of additional employment floorspace, including ancillary offices, access, car parking, service yard, landscaping, ecological enhancement areas and associated works. An illustrative masterplan is provided at Appendix A which demonstrates one way in which the development could come forward.

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2.0 Existing Site Details

2.1 History and Current Use

The site is located on the edge of Wrexham Industrial Estate. The site is bound by an existing industrial building to the West, the wider industrial state to the south, and agricultural land to the north and east. The site is currently accessed via the Industrial Estate Access Road to the West.

The developable site area is approx. 2.4 Ha and currently comprises a concrete yard area and access road, plus some areas of vegetation.

Earliest mapping (1870s) shows the site as undeveloped agricultural land, with small ponds located to the north, west and south of the site.

By 1972, a fiberglass factory was constructed on site, and immediately west of the site.

In addition to construction of the fibreglass factory to the west of the site, a Water Control Station, Gas Control Stations, tanks two electrical substations were constructed south of the main access road, at the southern part of the wider ownership boundary. Further industrial buildings were constructed north of the site, as well as other above ground tanks. 4 No. large warehouses were constructed 200m – 550m south and southwest of the site.

By 2005, the fibreglass factory, including associated infrastructure was demolished / redeveloped. The site was left vacant in its current layout and is currently used for storage.



Figure 2.1 – Existing Site Satellite Mapping

2.2 Existing Watercourses and Other Waterbodies

There are no main rivers identified within the proposed site.

Based on the Flood Mapping, the following Main Rivers are noted within the area of the site:

- Park Farm Drain: approx. 525m to the northeast of the site at its closest point
- Clywedog (lower Dee): approx. 1.1m to the southwest of the site
- Is y Coed Drain: approx.1.8Km to the east of the site
- River Dee, approx.: approx. 2.4 Km to the east of the site

There is a drainage ditch located at the eastern edge of the site. This flows towards the north, eventually discharging into the Park Farm Drain noted above. The Park Farm Drain flows northeast, and connects to the Is y Coed Drain, which in turn discharges to the River Dee.

2.3 Existing Topography

A Topographical Survey of the site was completed by Layer Surveys in February 2025 and is enclosed in *Appendix B*.

There are some areas of survey missing, as these were inaccessible to the survey team due to overgrown vegetation.

There are two yard areas within the site; the northern yard is set at a lower level, ranging from approx. 26.2m to 26.6m AOD. There is an existing retaining wall that runs along the northern edge of the yard, where the level rises to between 27.5m to 28.4m AOD.

The retaining wall also runs along the western and southern edges of the northern yard. The western wall form part of the existing building to the west of the site.

The southern retaining wall rises up to approx. 30.2m AOD generally where it forms the southern yard area. The levels in this yard then fall down towards the south towards the existing access road.

The access roads at the southwest corner of the site is at approx. 28.4m AOD. The road then falls along its length, running around the eastern site of the southern yard, to tie into the northern yard at a level of approx. 27.3m AOD.

The vegetated area in the eastern portion of the site, located between the yards/ access road, and the drainage ditch, is nominally level, but uneven ranging between 26.4m and 27.1m AOD. There is a bund located to the western edge of the drainage ditch, the top of which ranges from approx. 27.4m to 28.2m

The drainage ditch is located at the eastern edge of the site. The base of the ditch starts at a level of approx. 25.5m at the southern end, and then falls towards the north, with the lowest level survey being approx. 24.6m.

2.4 Existing Drainage

The Welsh Water public sewer records have been obtained for the site and surrounding area and are enclosed in *Appendix C*.

The records indicate that there are no public sewers located within the site.

A public combined sewer is approximately 780m to the west of the site, in Bryn Lane. This appears to flow in a generally westerly direction.

Private drainage

There currently has been no survey undertaken of the drainage within the proposed site. However, the topographical survey does indicate the presence of both drainage channels and manhole covers.

Anecdotally, it is understood that the surface water drainage for the site currently discharges to the drainage ditch to the east of the site and to ponds in and around the site. The ultimate outfall for the ponds is not known.

It is understood that the existing building to the west of the site has a foul drainage network that discharges to the combined network in Bryn Lane, noted above.

It is recommended that survey works are carried out in order to confirm the extent of drainage within the proposed site.

2.5 Geology

A Phase 1 Ground Investigation Report, Ref 089023-CUR-XX-XX-T-GE-00001, was undertaken by Curtins, dated March 2026

BGS mapping indicates the site is underlain by Till deposits (Secondary Undifferentiated Aquifer), anticipated to comprise clay soils based on review of BGS records. Underlying bedrock deposits are recorded as the Kinnerton Sandstone Formation (Principal Aquifer).

The site is not located within a Source Protection Zone (SPZ). The closest potable groundwater abstraction is located 934m north-east of the site for general farming and domestic purposes.

3.0 Development and Flood Risk

3.1 Planning Policy Wales and Technical Advice Note 15

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

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

3.2 Form of Development

TAN-15 recognises two key forms of development: New development and Redevelopment. The definition of both terms is provided in Table 3.1

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

Table 3.1 – Form of Development Definitions

The existing site consists of yard and road areas, as well as some areas of vegetation. For the purpose of this report, the site is to be treated as a new development

3.3 Vulnerability Classification

TAN-15 assigns one of three flood risk vulnerability classifications to a development, as shown in Table 1 below. As the proposed site is to be industrial and employment space the site falls within the highly vulnerable classification.

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

Table 3.2 – Development categories

The proposed development will be commercial development, and so is considered to be a **Less Vulnerable Development.**

3.4 TAN 15 – Acceptability of Flood Consequences.

Section 11 of TAN 15 outlines the basis behind assessing the acceptability of flood consequences within different Flood Zones. Section 1 states that:

'Whether a development should proceed or not will depend upon whether the consequences of flooding

can be safely managed, including its effects on flood risk elsewhere."

There are requirements that must be in place for any development that is permitted to be located in flood risk areas. In all circumstances, developers and planning authorities should ensure the following conditions are met:

- No increase in flooding elsewhere.
- Occupiers aware of flood risk
- Escape / evacuation routes present
- Flood emergency plans and procedures agreed and in place.
- Flood resistant and resilient design
- Acceptable consequences for types of use.

If the FCA identifies that the flood consequences are acceptable and the development is justified in its location the assessment can be used to establish whether suitable mitigation measures can be incorporated within the design to ensure that development is as safe as possible and there is:

- minimal risk to life;
- minimal disruption to people living and working in the area,
- minimal potential damage to property;
- minimal impact of the proposed development on flood risk generally; and,
- minimal disruption to natural heritage.' (Welsh Assembly Government, 2004, Section 7)

3.5 Statutory Standards and Guidance for Sustainable Drainage Systems (SuDS)

The Welsh Government have enacted the Flood and Water Management Act 2010 (Schedule 3) that came into effect in Wales on 7th January 2019, which requires new developments to include Sustainable Drainage System (SuDS) features that comply with national standards. The key documents published by the Welsh Government are the 'Statutory Standards for Sustainable Drainage Systems – Design, Construction, Operating and Maintaining Surface Water Drainage Systems' and 'Sustainable Drainage (SuDS) Statutory Guidance' dated 2018 and 2019 respectively.

These state that 'From 7th January 2019, all new developments of more than 1 dwelling house or where the construction area is 100m2 or more, will require sustainable drainage (SuDS) for surface water. SuDS must be designed and built-in accordance with Statutory SuDS published by Welsh Ministers and SuDS Schemes must be approved by the local authority acting in its SuDS Approval Body (SAB) role, before construction work begins' (Welsh Government, 2019).

This involves engagement with the local SAB, Wrexham Borough Council in this instance, for submission of a SAB Application, which is in addition to the Planning Application process with the intent that both processes run in parallel.

4.0 Hydrological Assessment

4.1 Flood Map for Planning

The majority of the site is located in Flood Zone 1, but includes some areas that are classed as Flood Zone 2/3. The maps show that this is being from surface water and small watercourse. This can be seen in figure 4.1, and the full map is enclosed in Appendix D.

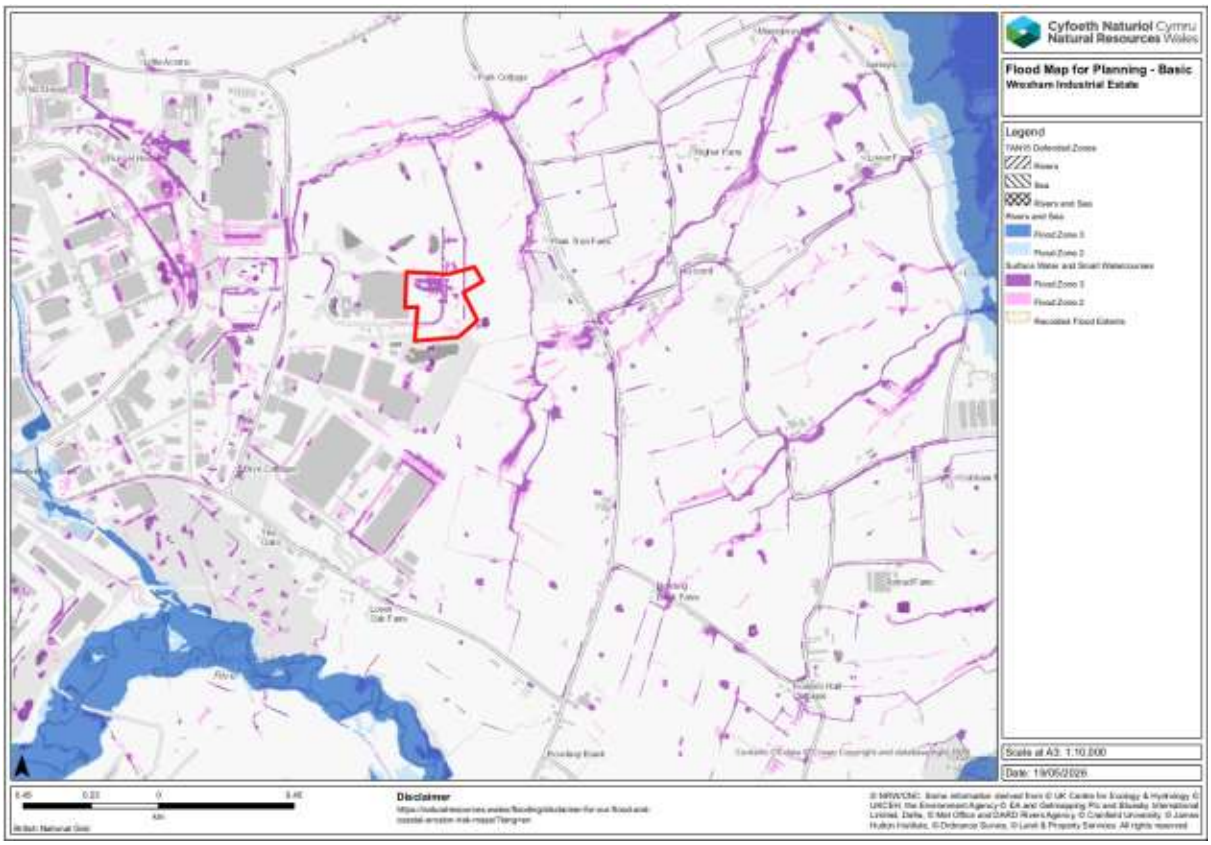


Figure 4.1 – Flood Map for planning

4.2 Flooding from Surface Water and Small Watercourses

For surface water and small watercourses Flood Zone 2 indicates an area with a 0.1% to 1% (1 in 1,000 to 1 in 100) chance of flooding from this source in a given year – including the effects of climate change,

For surface water and small watercourses Flood Zone 3 indicates am area with more than 1% (1 in 100) chance of flooding from this source in a given year – including the effects of climate change,

The drainage ditch to the east of the site shows area of Flood Zone 2 & 3. However, the extent of the flooding is retained within the vicinity of the ditch itself and does not encroach into the developed site area. The proposals do not include any works to the drainage ditch, and therefore it can be considered than there will be no increase to the flood risk in this case.

There are areas within the proposed developed area, which are shown as Flood Zone 2 and 3.

Overlaying the flood extent with the topographical survey for the site, the Flood Zone 3 areas correlate with localised low spots within the existing road, yard and vegetated areas. Given that the flood extent, in this case, is isolated from other flooding in the area, this indicates that the flooding surface water flooding is due the presence of low points within the developable area. In addition to this, it is likely that any drainage network present is not working properly due to lack of maintenance

As noted in Chapter 2, the topographical survey indicates that there are drainage channels and manholes within the existing yard area. It is recommended that the existing drainage within the site is surveyed to confirm the location and details of any drainage network.

Mitigation measures for this type of flooding are discussed in Chapter 5.1. taking this into account, the ultimate site flooding risk from small watercourses and surface water for the proposed site is considered LOW.

4.3 Flooding from Rivers or the Sea

Figure 2.2 indicates that the site is in Flood Zone 1 from rivers and sea and that the nearest area In a flood zone above this is circa 1.1Km southwest of the site, where the Clywedog (Lower Dee): is located. The flood map indicating all available flood risk data can be seen in Appendix D.

Given the above the risk of the site flooding from rivers and sea is considered LOW.

4.4 Historic Flooding

The flood risk maps from NRW also indicate recorded flood events which account for records held by NRW, its predecessors and other risk management authorities.

The map does not indicate any flooding events in the vicinity of the site, this can be found in Appendix D.

4.5 Flooding From Sewers

The Welsh Water sewer records indicate that the closest sewer to the site is located approx. 780m to the west of the site. This is the combined sewer in Bryn Lane, which flows to in a westerly direction.

Given the distance of the sewer from the site, the risk of the site flooding from this source is considered LOW.

4.6 Flooding From Reservoirs, Canals and Artificial Sources

The flood risk assessment map does not indicate that the site is in the vicinity of areas at risk of flooding from any of these sources. There are no canals near to the site and the nearest reservoir is Marchwiel reservoir which is 4.5km southwest of the site.

Given the above, the risk of the site flooding from these sources is considered LOW.

4.7 Groundwater Flooding

To assess the groundwater flood risk, a review of historic boreholes in the site was reviewed on British Geological Survey.



Figure 4.4; Extract from BGS Historic Borehole Maps

A review of the borehole information indicates that ground in this area is clay down to a depth of 15m. (Total depth of boreholes the boreholes). No information was provided for the material underneath the clay layer.

None of the boreholes were noted as containing any groundwater within them. Therefore, it is considered that any groundwater will flow under the clay layer towards the drainage ditches and the River Dee.

Therefore, it is considered that any seasonal rise in groundwater levels would be unlikely to cause flooding at the surface, and the risk form groundwater is considered LOW.

4.8 Overall Flood Risk and Development Suitability Assessment

The site is mostly located in flood zone 1 for all sources of flooding meaning that it is at a low risk of flooding from these sources. There are areas in flood zone 2/3 throughout the site, when considering the risk of flooding from surface water and small watercourses.

The flood risk from surface water and small waterbodies has been discussed in section 4.2 and results in the risk of the site flooding from the source as also being LOW.

As the site and surrounding areas have been justified as being at a low risk of flooding from all sources, access and egress to the site is not considered to be an issue where there may be potential flood events elsewhere.

The development is considered less vulnerable, and given the above evidence, the flood risk for the site indicates that the proposed development is suitable.

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5.0 Mitigation

5.1 Flooding from Surface Water and Small Watercourses

The levels of the low points within the developable site area range from approx. 32.5m to approx. 26.2m AOD. It is proposed that the developable area will be raised to provide and floor level of 28.00m AOD. The lowest level within the developable area will be approx. 26.8m, to suit the dock levellers.

The dock levellers are surrounded by area set at a higher level (above 27m AOD and the flood extent indicated on the mapping would therefore not enter the developable area.

Due to levels of the site being raised above the current low points, and the introduction of a surface water drainage network, the risk of flooding from this source is considered LOW.

5.2 Surface Water Flooding from the site Mitigation

Any new development site drainage should be designed in accordance with current best practice to provide adequate capacity not to flood for the critical 1 in 30-year storm event and flood water generated from up to the critical 1 in 100-year plus climate change storm event shall be constrained within the areas on site so not to cause damage to buildings, essential services or adjoining developments & services.

Section 6 reviews the surface water discharge options, and it is proposed that the surface water will. discharge to the culverted watercourse crossing the site at greenfield run-off rates previously agreed with the Lead Local Flood Authority (LLFA). The proposed location for the surface water discharge is via the surface water public sewer system.

To minimise localised flooding within the site, the drainage design should ensure that gullies, drainage channels and drains are all suitably sized to accommodate peak storm flows. Also, all inlet features should have suitably sized sumps to catch silts and should be subject to a documented routine maintenance and cleansing regime.

Flood water exceedance routes should be identified, both on and off site.

For any sustainable drainage systems employed in the development, an appropriate management and maintenance plan for the sustainable drainage system for the lifetime of the development should be submitted which should include:

- Any arrangements for adoption by an appropriate public body or statutory undertaker, or management and maintenance by a Management Company
- Arrangements concerning appropriate funding mechanisms for on-going maintenance of all elements of the sustainable drainage system (i.e. inspections, regular maintenance)
- Means of access for maintenance and easements where applicable

Assuming that the proposed drainage system is designed to provide adequate capacity, and that the private and adopted sewers will be maintained by the relevant authority / body, it can be assumed risk of flood from blockage or overloading is minimal.

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The final design of the drainage networks shall be in accordance with the requirements set by the Wrexham County Borough Council.

6.0 Sustainable Surface Water Drainage Strategy

The proposed surface water drainage that will serve the development has been designed in accordance with the Welsh Government Statutory Standards for Sustainable Drainage Systems guidance from 2018 which outlines 6 standards, with standard 1 being broken into levels where if level 1 is unable to be met, further justification must be provided to use a lower level. The remaining 5 standards outline requirements that should be met for all SuDS systems.

S1 – Surface Water Runoff Destination
S2 – Surface Water Runoff Hydraulic Control
S3 – Water Quality
S4 – Amenity
S5 – Biodiversity
S6 – Design of Drainage for Construction, Operation and Maintenance and Structural Integrity

These standards will be discussed in the following sections.

The proposed surface water drainage system will be designed to store and convey the critical 1 in 100 year + 40% climate change storm events. The proposed drainage drawings can be seen in Appendix E and calculations in Appendix F.

6.1 Standard S1 – Surface Water Runoff Destination

This standard indicates surface water runoff destinations, which are split into the following levels, with level 1 being the preferred method:

Priority Level 1: Collection for use
Priority Level 2: Infiltration to ground
Priority Level 3: Discharged to a surface water body
Priority Level 4: Discharged to a surface water sewer, highway drain or another drainage system
Priority Level 5: Discharged to a combined sewer

Table 5.1 below reviews the suitability of each level for the proposed development.

Destination	Comments	Suitable
Water re-use	The site will be for commercial use, which means that there may be long periods of time where the building is unoccupied, and also may mean that demand on water is low, meaning water potentially sitting and not being used, there is also limited areas of soft landscaping where the water could be used externally	X
Infiltration	As outlined in section 2.5 it is understood that the ground is likely to comprise clays, which are generally not suited to infiltration methods. Subject to the results of the Phase 2 Site investigations and Infiltration testing.	X
Surface Water Body	There is a drainage ditch located within the eastern end of the site. This discharges into a main river to the northeast of, and ultimately to the River Dee	✓
Surface Water Sewer	The Welsh Water sewer records do not indicate the presence of surface water sewers within the vicinity of the site	X
Combined Sewer	The Welsh indicates the closet combined sewer is approximately 400m to the west of the site, and would likely require a pumped connection	X

Table 6.1 – Surface Water Destination Summary

Based on Table 6.1, the only current option for discharging the surface water runoff from the site is to discharge to surface water body, via the drainage ditch in the eastern part of the site.

It is recommended that infiltration tests are conducted as Phase 2 Site Investigation Report in order to confirm the suitability of the site for infiltration.

The proposed drainage layouts can be seen in Appendix E.

6.2 Standard S2 – Surface Water Runoff Hydraulic Control

This standard only applies where the surface water discharges to surface water bodies and sewer systems.

The proposed solution is to deal with the runoff by discharging to the drainage ditch in the east of the site. The current developable area consists of concrete yard areas, roads, and areas of vegetation. The

topographical survey indicates that some drainage measures exist, but no details are known. Therefore, the proposed drainage has been designed to discharge at greenfield runoff rates.

The greenfield runoff has been calculated using the calculator provided by UK SudS, a copy of the Greenfield Runoff Calculations are enclosed in *Appendix F.*

The total Impermeable Area has been taken as 2.42 Ha. This may be subject to minor change following confirmation of the proposed floor levels and external works design.

It is proposed to restrict flows to QBar – the value provided by the Uk SuDs site has been calculated as **11.3 l/s**

Any new development site drainage should be designed in accordance with current best practice to provide adequate capacity not to flood for the critical 1 in 30-year storm event and flood water generated for up to the critical 1 in 100-year plus climate change storm event shall be constrained within the areas on site so not to cause damage to buildings, essential services or adjoining developments and services.

In March 2026, the updated climate change allowances for peak rainfall intensities for Wales were released, which should be applied to new developments.

Based on the Climate Change Allowance Document, a lifespan of 75 years is assumed. Therefore, the potential climate change allowance for the 2070's ranges between 30% for the central allowance and 40% for the upper end allowance. For the purposes of the drainage design, an allowance of 40% climate change has been included for the 100-year storm event,

Location	Percentile	2050s (present day -2060)	2070s (2061-2125)
Wales	Central	20%	30%
	Upper	35%	40%

Table 6.1: Rainfall Uplifts for Wales

6.3 Standard S3 – Water Quality

Treatment of the surface water run off should be provided to prevent negative impacts on the receiving system. The level of treatment required depends on the land use that the run off is generated from, figure 5.1 is a snippet of table 26.2 from the CIRIA SuDS manual, 2015.

TABLE 26.2 Pollution hazard indices for different land use classifications

Land use	Pollution hazard level	Total suspended solids (TSS)	Metals	Hydro-carbons
Residential roofs	Very low	0.2	0.2	0.05
Other roofs (typically commercial/ industrial roofs)	Low	0.3	0.2 (up to 0.8 where there is potential for metals to leach from the roof)	0.05
Individual property driveways, residential car parks, low traffic roads (eg cul de sacs, homezones and general access roads) and non-residential car parking with infrequent change (eg schools, offices) ie < 300 traffic movements/day	Low	0.5	0.4	0.4
Commercial yard and delivery areas, non-residential car parking with frequent change (eg hospitals, retail), all roads except low traffic roads and trunk roads/motorways[1]	Medium	0.7	0.6	0.7
Sites with heavy pollution (eg haulage yards, lorry parks, highly frequented lorry approaches to industrial estates, waste sites), sites where chemicals and fuels (other than domestic fuel oil) are to be delivered, handled, stored, used or manufactured; industrial sites; trunk roads and motorways[1]	High	0.8[2]	0.8[2]	0.9[2]

Figure 6.2 Pollution hazard indices for different land use classification

The site comprises a combination of ‘other roofs’ and ‘residential car parks/ car parking with infrequent change’ which are both considered to have a ‘low’ pollution hazard level. For this hazard level, the simple index approach is appropriate to determine the level of treatment required.

The design intent for the site is for the parking areas and access aisles to drain via permeable pavements prior to connection to the drainage network.

The concrete yard area will be drained either directly into a swale, or through a linear drainage channel, which discharges into the sale.

The exception to this is the dock levellers, as these will sit too low to allow connection to the swale. In this case, the drainage will pass through a Petrol Interceptor or similar proprietary device prior to connection to the network.

For the roof areas, these will be served by siphonic drains. Due to the velocity that is typical of siphonic drainage systems, connecting these to the swale may cause issues with scour. Therefore, the siphonic drainage will be collected in catchpits, prior to discharge to the swale.

Figure 5.3 below highlights the mitigation indices for different SuDS features, table 26.4 from the SuDS annual has been used as infiltration is the intended discharge destination for the run off. The mitigation indices should be greater than the hazard.

TABLE 26.3 Indicative SuDS mitigation indices for discharges to surface waters

	Mitigation indices[1]		
Type of SuDS component	**TSS**	**Metals**	**Hydrocarbons**
Filter strip	0.4	0.4	0.5
Filter drain	0.4[2]	0.4	0.4
Swale	0.5	0.6	0.6
Bioretention system	0.8	0.8	0.8
Permeable pavement	0.7	0.6	0.7
Detention basin	0.5	0.5	0.6
Pond[4]	0.7[3]	0.7	0.5
Wetland	0.8[3]	0.8	0.8
Proprietary treatment systems[5,6]	These must demonstrate that they can address each of the contaminant types to acceptable levels for frequent events up to approximately the 1 in 1 year return period event, for inflow concentrations relevant to the contributing drainage area.		

Notes

1 SuDS components only deliver these indices if they follow design guidance with respect to hydraulics and treatment set out in the relevant technical component chapters.

2 Filter drains can remove coarse sediments, but their use for this purpose will have significant implications with respect to maintenance requirements, and this should be taken into account in the design and Maintenance Plan.

3 Ponds and wetlands can remove coarse sediments, but their use for this purpose will have significant implications with respect to the maintenance requirements and amenity value of the system. Sediment should normally be removed upstream, unless they are specifically designed to retain sediment in a separate part of the component, where it cannot easily migrate to the main body of water.

4 Where a wetland is not specifically designed to provide significantly enhanced treatment, it should be considered as having the same mitigation indices as a pond.

5 See Chapter 14 for approaches to demonstrate product performance. A British Water/Environment Agency assessment code of practice is currently under development that will allow manufacturers to complete an agreed test protocol for systems intended to treat contaminated surface water runoff. Full details can be found at: **http://tinyurl.com/qf7yuj7**

6 SEPA only considers proprietary treatment systems as appropriate in exceptional circumstances where other types of SuDS component are not practicable. Proprietary treatment systems may also be considered appropriate for existing sites that are causing pollution where there is a requirement to retrofit treatment. SEPA (2014) also provides a flowchart with a summary of checks on suitability of a proprietary system.

Figure 6.3: Indicative SuDS mitigation indices (Table 26.3 the CIRIA SuDS manual 2015)

For the roof areas the hazard indices are 0.3, 0.2 and 0.05 for TSS, metals and hydrocarbons respectively. These areas will pass through the swale, which provide mitigations of 0.5, 0.6 and 0.6 for the above categories. It can be seen that the proposals provide suitable treatment for these areas.

For the parking areas the hazard indices are 0.5, 0.5 and 0.4 for TSS, metals and hydrocarbons respectively. These areas will pass through a permeable pavement with mitigation indices of 0.7, 0.6 and 0.7 for the above categories. It can be seen that the proposals provide suitable treatment for these areas.

For the concrete apron the hazard indices are 0.6, 0.6 and 0.6 for TSS, metals and hydrocarbons respectively. The mitigation indices for a swale are 0.5, 0.6 and 0.6 for the above categories. Therefore, the drainage from the apron area will pass through a proprietary treatment phase before entering the swale. The proprietary treatment will be designed to provide sufficient equivalent so that the overall treatment indices are matched.

For the dock levellers, the proprietary treatment will be designed to provide sufficient equivalent mitigation indices for the risks noted.

6.4 Standard S4 – Amenity

This standard ensures that, where possible, the design of SuDS features provide a high quality, attractive public space.

The landscape architect will ensure that suitable amenity areas are provided as part of the final site layout. Suitable planting is added to the area to enhance the feature and make it an attractive green open space. If possible, signage should also be added to outline the use of the area and how it is maintained.

6.5 Standard S5 – Biodiversity

This standard ensures, where possible, that the SuDS features on a site create an ecologically rich green/ blue corridor to enrich biodiversity on sites.

The swale provides an opportunity to provide a biodiverse corridor along the eastern edge of the developable area. Suitable planting within the swale will be developed with the assistance of the Landscape Architect in order to improve the biodiversity of the site.

6.6 Standard S6 – Design of Drainage for Construction, Operation and Maintenance and Structural Integrity

The proposed drainage strategy has been designed with constructability, ease of operation and maintenance as well as structural integrity in mind.

An operation and maintenance manual will be produced at detailed design stage and updated as the scheme progresses through to handover.

The design follows the standards set out in the Building Regulations Part H 2010 as well as the Sewerage Sector Guidance Appendix C (Design and Construction Guidance) 2023 and CIRIA SuDS manual 2015.

This will ensure the drainage has suitable falls, access and structural integrity to suit the development's needs.

6.7 Nutrient Neutrality

Nutrient neutrality is a critical aspect of the planning system in the UK, particularly for developments in nutrient neutrality catchments. It ensures that new developments do not contribute to increased nutrient pollution in protected sites.

The Nutrient Neutrality requirements are covered in a sperate report, reference 089023-CUR-XX-XX-T-C-92001.

7.0 Foul Water Drainage Strategy

The foul water generated on site will be conveyed in a drainage system separate to the surface water and will discharge to the existing Welsh Water combined sewer system to the west of the site in Bryn Lane.

Based on the proposed levels, compared to the existing levels to the west of the site, it has been assumed that the foul drainage will need to be pumped in order to be able to connect into the sewer. This is subject to confirmation of the invert level in the combined sewer.

Further Investigations are recommended to confirm what existing drainage is present within the site, as noted on the topographical survey. If a connection, either by gravity or pumped, to this network is suitable, then the design will be reviewed at detailed design stage.

The design follows the standards set out in the Building Regulations Part H 2010 as well as the Sewerage Sector Guidance Appendix C (Design and Construction Guidance) 2023.

This will ensure the drainage has suitable falls, access and structural integrity to suit the development's needs.

Welsh Water will be contacted regarding the connection to the sewer system to ensure that there is suitable capacity for the expected flows. DCWW have stated in the pre development enquiry that there is capacity at the Five Fords WWTW, but the public combined system in Bryn Lane does not have sufficient capacity.

An assessment of the on site drainage system has been undertaken and there is no surface water flows known to the combined system that could offset the introduction of foul water into the DCWW system.

DCWW have been asked to provide a Hydraulic Capacity Assessment to indicate where network strengthening could be undertaken to allow the development to connect to the public system for its foul water.

Alternatively a package treatment plant could be considered locally.

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8.0 Conclusions

The Flood Map for Planning indicates the site is mostly in Flood Zone 1 or at a low risk of flooding from all sources other than some areas that are in Flood Zone 2/3 for surface water flooding.

Due to the proposed site raising levels across the site, the flood risk associated with this is deemed to be low for the proposed development. The risk of flooding from all other sources of flooding is considered to be low.

The surface water drainage system discharge the surface water runoff from the site to the drainage ditch located in the east of the site. The discharge rate from the site has been calculated as 11.3 l/s, based on greenfield runoff rate calculations.

SuDS features including permeable pavements, swales and proprietary treatments will be utilised to provide water quality treatment and improve the biodiversity and amenity on the site.

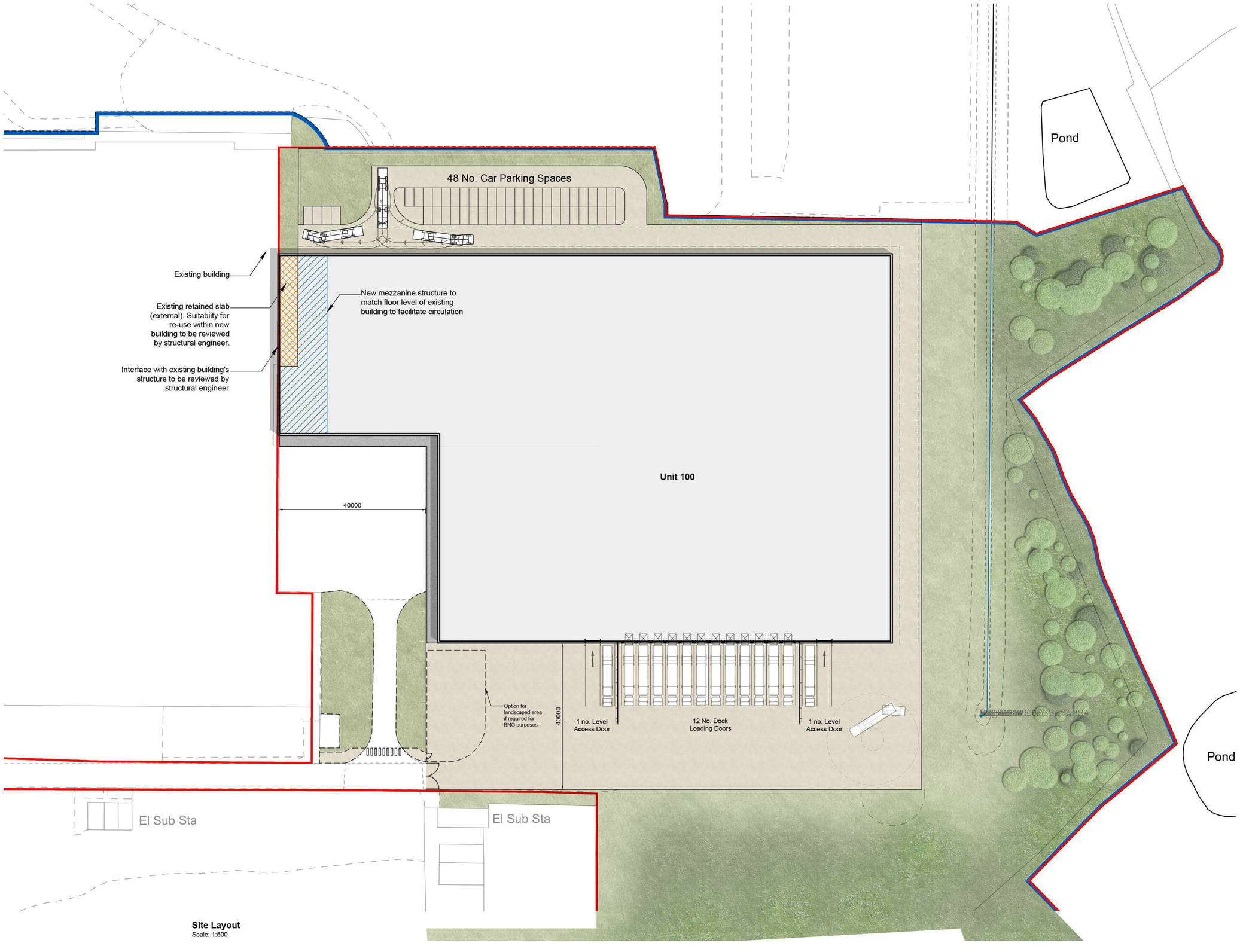
The foul drainage will be conveyed via gravity to the Welsh Water combined sewer to the west of the site. It is assumed that this will require a pumped connection. The connection will be discussed with Welsh Water and will be informed by DCWW hydraulic capacity assessment which is awaited.

Infiltration testing to BRE 365 and a CCTV survey, including jetting and clearing, of the existing drainage is required to confirm the design proposals and existing drainage situation.

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Appendix A

Proposed Site Plan



Site Layout
Scale: 1:500

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North:

Document Scale(s)

10m SCALE 1:500

10m SCALE 1:2000

Boundary Notes

The site boundary indicated is taken from Title Plan ref: CYM647568. Please note this information has been provided in scanned .pdf format and is subject to further clarification.

Schedule of accommodation

Total GIA - 14,996 sqm (161,495 sqft)

Project Name

Wrexham Industrial Estate, Bryn Lane

Employer	Project Address
Elite Onyx Properties (UK) SARL	**LL13 9UT**

RIBA Workstage	Suitability
1 - Preparation and Brief	**S2 - Information**

Drawn	Checked	Created	Size
LTS	**SH**	**09.03.2026**	**A1**

UMC Project Reference	Scale	LOD	LOI
26073	**As indicated**	**1**	**1**

Document Title

Site Layout Option 05 (no office, joined)

Document Reference

26073 - UMC - ZZZZ - SI - DR - A - 0115

Revision Note

Pedestrian crossing added

Issue Date	Status	Current Revision
11.05.2026		**P03**

Appendix B

Topographical Survey