



The prime function of SuDS, as with conventional drainage, is to provide effective surface water drainage, ensuring the greatest degree of flood risk protection over the long term both within and downstream of the development and prevent pollution. However, SuDS approaches can bring wider benefits too. Appropriately designed, constructed and maintained, SuDS are more sustainable than conventional drainage systems and can help to:

- Reduce run-off surface water flow-rates and/or volumes and hence reduce the risk of flooding
- Encourage natural groundwater re-charge
- Reduce pollutant concentrations in storm water
- Provide habitat for wildlife.

There are many site-specific factors which will influence the choice of any single or combination of SuDS devices used within a development. The primary factors are:

- Whether the development is domestic, commercial or industrial
- Whether the underlying ground is contaminated. If so, infiltration systems will most probably not be permitted
- Whether the underlying ground is permeable enough for infiltration systems to be considered.
- Whether the ground water levels are deep enough for infiltration systems to be considered
- Whether the site is steeply sloping and its general topography
- The availability of space inside the development for each potential SUDs facility.
- Health & Safety aspects should the development be likely to be inhabited or used by children.

To ensure no increased flood risk to offsite land and development, disposal of surface water to the ground is encouraged and runoff volumes will be reduced through the SuDS management train where ground conditions permit. Where ground conditions are unsuitable, a discharge to an open water body / sewer will be necessary with rates restricted to the existing site conditions.

Existing Drainage

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A piped network currently drains into a holding tank serving the farm and all outbuildings before the flows are passed forward to the watercourse approximately 80m east of the application boundary.

There are no public sewers within the vicinity of the site. Therefore we are proposing a single property wastewater treatment plant with an effluent discharge into the watercourse. The site is located within the catchment of the River Dee and Bala Lake Special Area of Conservation (SAC) which will require consideration of any impact of increased phosphate levels within the catchment. We are proposing a Klargester BioDisc which has capability of reducing phosphate levels prior to being passed forward to the watercourse.

1. Collection for re-use
The developer is not proposing the use of rainwater harvesting for re-use within the dwellings. Rainwater harvesting alone would not be adequate to deal with the surface water flows from the site and provision will be required for an overflow to a Level 2 or lower priority runoff destination. Therefore RWH systems are not considered a cost effective solution for managing surface water and a lower priority runoff destination is required.

Water butts will be installed on rear RWP's for garden re-use.

SUDS Planters will be installed on front RWP's

2. Infiltration

Recent ground works on site have determined the site is underlain with clay and will therefore not be suitable for infiltration techniques to dispose of surface water flows from the site. The proposed access / driveway will be loose gravel with a open sub base. This will provide storage with slow infiltration to the cohesive strata and also allow for evapotranspiration. This will assist with meeting the 5mm interception requirement.

There is a network of un-named watercourses and ditches which flows east following the topography. Existing surface water connections from the existing farm and outbuilding barn have been confirmed and we are proposing to mimic the existing situation but with betterment on flow rates.

There are no surface water sewers within the vicinity of the site

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of the site

Interception - The retention of the first part of a rainfall event to prevent surface water runoff occurring.

- The majority of rainfall events in the UK are less than 5 mm in depth
- Rainfall runoff from paved surfaces contains a range of pollutants; many associated with vehicle emissions.
- Pollutant concentrations tend to be highest in the early stages of a rainfall event
- If the first 5 mm of every event was prevented from leaving the site, the total volume of runoff discharged into the receiving streams and rivers through the year would be a relatively small proportion of the total runoff generated by the site

120sq.m. roof area requires 0.6cu.m. interception
This can be provided with a 300 litre water butt
(garden re-use and car washing) and 3 No. Planters
min 1.0 x 0.6 x 0.6m deep.

Maintenance of all surface water components will be subject to SAB approval and will be maintained by the property owner for the lifetime of the development.

Maintenance requirements will be considered further at detailed design stage and a 'SUDS Management Plan' will be produced to address the frequency and type of maintenance activities.

Site Area = 810sq.m.

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(Based on 120sq.m. existing barn roof area only)

1yr	=	0.8 l/s	(26 mm/hr rainfall)
30yr	=	2.1 l/s	(65 mm/hr rainfall)
100yr	=	2.7 l/s	(83 mm/hr rainfall)

1yr = 0.6 l/s
30yr = 1.2 l/s
100yr = 2.5 l/s
QBAR = 0.7 l/s

1yr = 0.7 Ms
30yr = 0.7 Ms
100yr = 0.7 Ms

1. This proposal provides a betterment on the surface water drainage from the existing situation with the incorporation of SUDS features and a flow control to limit the flows from the site.
2. The specification in all respects shall be in accordance with the current Wiltshire County Borough Council Specification and Construction publication in force in the county at the time of construction.
3. All private drainage works are to comply fully with Part H of the Building Regulations.
4. All existing invert levels to be checked by the contractor at the start of works and any other discrepancies notified to the Engineer prior to commencing works. All levels are based on topographical survey information provided by others.
5. It is the responsibility of the Contractor to verify all information given with regard to existing services and drainage connections etc, prior to commencing the works.
6. The Contractor shall adhere to the CDM Regulations at all times.
7. Only trained personnel shall be permitted to enter confined spaces.
8. Drain trenches should not be excavated lower than the foundations of building nearby unless otherwise:
 - a) Where the trench is within 1m of the foundation, the trench is filled with concrete up to the lowest level of the foundation, or
 - b) Where the trench is further than 1m from the building, the trench is filled with concrete to a level above the lowest level for the building equal to the distance from the build, less 150mm.
9. All SVP and RWP connections are indicative and shall be confirmed by the client.
10. Pipe gradients out of the building to connecting manholes to be laid at 1:40 in accordance with Building Regulations, Part 7, Table 6.
11. Where pipe sizes are not indicated :
1000 to be used for foul
1000 to be used for surface water unless stated otherwise.
12. Minimum surface water gradients shall be:
1000 laid at 1:100 with the exception of the first connection which shall be minimum 1:50
13. Minimum 1000d foul drainage gradient to be 1:80 with the exception of the first connection which shall be minimum 1:40
14. Manhole covers to be marked FWS or SW as appropriate.
15. All manhole covers and frames shall comply with BS EN1241. Covers in roads to be grade D400 and be 150mm deep. Manhole covers in car parking areas and drives to be grade B125 and covers in landscaping areas to be grade A15. All to be sized in accordance with Building Regulations Part H, Tables 11 & 12.
16. Private drains laid under adopted / private roads to be Class S granular bed and surround with a minimum of 12mm cover, where this cannot be achieved, and drives to be Class 2 concrete bed and surround shall be provided.
17. Private drains located under landscape areas or driveways / car parking bays to be Class S granular bed and surround with a minimum 60mm cover, where this cannot be achieved a Class 2 concrete bed and surround shall be provided.
18. Pipes have not been designed to accommodate adequate traffic loading. The contractor is responsible for providing adequate protection to the pipes during construction.

Legend

-  Site Boundary
-  Proposed Foul Drain
-  Proposed Surface Water Drain
-  Water Butt (garden re-use)
-  SUDS Planter (at RWP Outlet)
-  Cellular attenuation
-  Porous Gravel Paving

Client	MARK BAKER		
Project	UPPER BARN TYDDYN DEDWYDD RHOSTYLLEN, WREXHAM		
Title	DRAINAGE STRATEGY		
DRAWING NUMBER	REVISION	SCALE at A1	1:250
SK / 01	B	DATE	July 2021
		DRAWN	AJ