



Outline Drainage Statement

DATE:	17 December 2021	CONFIDENTIALITY:	Confidential
SUBJECT:	Outline Drainage Statement		
PROJECT:	Land off Cilycwm Road, Llandovery	AUTHOR:	DJM
CHECKED:	ARW	APPROVED:	ARW

INTRODUCTION AND SITE SETTING

This drainage statement has been prepared in support of a pre-application submission for the proposed development site off Cilycwm Road, Llandovery.

Site Setting and Development Proposals

The development site comprises an area of approximately 0.47ha of greenfield land, with the site currently used as a playing field and cricket ground. The site is located within Llandovery, with an approximate postcode of SA20 0DU, and a National Grid Reference of 276625, 235025.

The site is bound to the west by Cilycwm Road, to the north by the Heart of Wales railway line, to the east by the Llandovery Cricket Ground, and to the south by Nø7A Cilycwm Road.

The proposed development is for construction of 12 dwellings and associated infrastructure.

Existing Watercourses and Drainage

The site lies to the west of a minor watercourse formed from a sluice feature off the main Nant Bawddwr approximately 500m north of the site. This watercourse routes southwards along the eastern boundary of the adjacent playing fields, and then westwards along the rear of properties forming Llys Llanfair, before being culverted along Cilycwm Road.

Topographical survey has identified a number of highway drainage features within Cilycwm Road.

The nearest public sewer is a 225mm combined sewer located approximately 50m south of the site in Cilycwm Road.

SURFACE WATER DRAINAGE

The aim of the surface water drainage strategy is to mimic the natural catchment processes as closely as possible and adopt the principles of water management scheme as stated in section 2 of the statutory “Sustainable Drainage Systems Standards for Wales” (SDSSW) document 2018.

S1 – Surface Water Runoff Destination

Re-use of surface water runoff is likely to be financially unviable on the proposed scheme however it will be considered further at the next stage of the project. Notwithstanding this, it would certainly need to be supplemented by another method of disposal.

The proximity of the north portion of the site to a Network Rail embankment is likely to prohibit the acceptability of infiltration of surface water runoff over a large extent of the site, as it is understood that infiltration is typically prohibited within 20m of Network Rail assets.

A review of British Geological Survey’s Geology of Britain viewer indicates the site lies on sand and gravel, overlying mudstone formation, indicating infiltration could be feasible but this would need to be proven via



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infiltration testing. Infiltration testing is not yet available but is in the process of being carried out. Additionally, due to the proximity of the site to the watercourse, groundwater levels could well prohibit infiltration as a suitable method of discharge.

The outline proposal for the discharge of runoff from the site is into the drainage system serving Cilycwm Road. Further survey is required to identify the full routing, discharge, levels and capacity of this drainage system and confirm additional levels of chambers in this sewer. It is noted that the arrangement of the connection will need to be approved by the responsible authority, and this is yet to be agreed.

Consideration was also given to discharging runoff into the adjacent watercourse, however, levels extracted from LiDAR information indicate that the invert level of the watercourse adjacent to the playing field is approximately 67.3mAOD, rendering it impractical to drain the site into this watercourse due to level constraints. Furthermore, it is noted that the natural catchment of the site does not fall towards this watercourse but instead towards Cilycwm Road. Further survey is required to confirm the invert level of the watercourse, and that of its culverted/open section alongside Cilycwm Road in order to allow a more detailed review/consideration of a discharge into this feature.

S2 – Surface Water Runoff Hydraulic Control

The total site area is circa 0.47ha, with 0.22ha of proposed impermeable area, for which the greenfield runoff rates have been calculated. The FEH methodology requires that, for catchments of less than 50ha, the greenfield runoff rate assessment is completed for a 50ha area with the results linearly interpolated to determine the relevant flow rates.

Table 1 summarises the greenfield runoff rates for each return period, alongside the equivalent discharge rates.

Table 1 Greenfield Runoff Rates

Storm Event	Per Hectare Discharge (L/s/ha)	Equivalent Discharge Rate (L/s)
QBAR	5.4	1.2
1 in 30	9.6	2.1
1 in 100	11.7	2.6

Due to the low equivalent discharge rate for the site, it is proposed to utilise a maximum discharge rate for the site of 2.5L/s for storm events up to and including the 100-year return period, with a 40% allowance for climate change, and a 10% uplift on impermeable areas for urban creep.

This discharge rate has been proposed in order to limit flows whilst minimising the risk of blockage at the proposed flow control location.

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Attenuation volumes for the site have been estimated on the basis of utilising a geo-cellular attenuation tank. Estimated attenuation volumes and modelling assumptions are given in Table 2.

Table 2 Attenuation Storage Requirements

Attenuation Feature	Storage Volume (m ³)	Assumptions
Geo-Cellular Tank	183	0.95 Void Ratio 0.5m storage depth

S3 – Water Quality

Sediment will need to be trapped and retained on site and consideration for maintenance access will be undertaken at the detailed design stage for the purpose of intermittent sediment removal. It is proposed that sump units will be used where possible to intercept sediment; furthermore, natural interception processes will be utilised where possible via incorporation of rain garden features and the swale.

S4 – Amenity

Key amenity benefits provided by the proposed drainage scheme include provision of a multi-functional drainage system with features such as a rain garden and swale which act to drain and attenuate surface water as well as providing opportunity to be used as pleasant amenity areas within and around the development.

S5 – Biodiversity

The drainage scheme will support the inclusion of plant species that will enhance the general eco-system by increasing the variety of habitats available, and simultaneously act as a water filtration system to clean pollutants and contaminants.

In general, the rain garden and swale will be the focal habitats for the development and be planted with species suitable for both inundation and drought conditions.

S6 – Design of Drainage for Construction and Maintenance and Structural Integrity

The surface water drainage system is proposed in order to allow for simplicity of construction and maintenance.

It is recommended that chambers located within the flood extent are fitted with sealed covers in order to prevent ingress of flood waters into the proposed system.

Information with regards to the construction methodology and requirements of the proposed system will be developed as part of the detailed design stage of the project, likewise the maintenance requirements and



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regime of the proposed system will be developed into the full maintenance strategy for the site during the next phase of design development.

FOUL WATER DRAINAGE

It is proposed that the site will be drained via the public sewerage system, with a connection formed with the existing public sewer located in Cilycwm Road.

Additional survey is required of the existing public sewer to confirm if the on-site drainage will be drained wholly by via gravity or if a pumping station/land raising will be required.

Proposed flows from the site have been estimated on the basis of a flow rate of 0.046L/s as described by Sewers for Adoption 7th Edition, yielding a predicted development flow rate of 0.55L/s.