

Highway Drainage Design Guide

2023

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Highway Drainage Design Guide

1. Introduction

This policy sets out the expectations and requirements for surface water drainage systems related to new developments which are sited within the highway and are to be promoted for adoption by Carmarthenshire County Council or connected to existing highway drainage systems.

This document related to highway drainage has been drafted to supplement the Highway Design Guide.

The adopted approach supports the principles of designing and constructing sustainable urban drainage systems.

2. Sustainable Drainage

2.1 It should be noted that as of the 7th January 2019 developments of over 100 square metres, which impact on the ability of the ground to absorb rainwater, require the approval of the surface water drainage system by the SuDS Approving Body (SAB) before construction work can commence. It is expected that most, if not all, proposals being prepared to meet these highway standards will meet that threshold. For those sites which can demonstrate that they have a legitimate exception to the requirement for SAB approval it is recommended that the principles contained in the Statutory SuDS Standards are still followed in the design of the site drainage.

2.2 It should also be noted that the Statutory SuDS Standards, against which SAB applications will be assessed, set out a hierarchy that must be followed in determining the surface water run-off destination (from either the highway or from properties):

- 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.

Where priority levels 1-3 are not appropriate connection to an existing highway drain or surface water drainage system will be the expected route for surface water disposal, unless:

- It is not reasonably practicable to convey the surface runoff to a surface water sewer or highway drainage system;
- It is not possible to discharge the surface water to a surface water sewer or highway drainage system without the use of pumping;
- The discharge would result in an unacceptable increase in the risk of flooding.

2.3 There are 6 SuDS Standards including, destination (see above), hydraulic control, water quality, amenity, biodiversity and design; all of which must be complied with as part of the sustainable drainage scheme for the development. For further advice in regard to the overall SuDS scheme please contact the Sustainable Drainage Approval Body SAB@carmarthenshire.gov.uk.

2.4 Where discharges are made to a highway drain, agreement will need to be made with Carmarthenshire County Council's Highways & Transportation Service. Applicants seeking to make a connection to a highway drain will be expected to have held prior discussions with the SAB and agreed design and discharge parameters.

2.5 Where a SAB application may impact on a road, or an associated drainage system which the local Highway Authority is responsible for, the SAB will consult with the Highway Authority as part of the SuDS approval process.

2.6 The surface water drainage shall be in compliance with the requirements of the documents listed below, to ensure that flood risk and sustainable drainage system requirements are satisfactorily addressed to mitigate the potential adverse impact of any new development. The developer shall also undertake Hydraulic Impact Assessment (HIA) for the proposed site to ensure that there will be nil detriment upon the existing drainage regime and risk of flooding within the area in accordance with the requirements of: -

- i) Flood Risk Regulations 2009
- ii) Flood and Water Management Act 2010
- iii) Sewers for Adoption 7th Edition
- iv) Technical Advice Note 15 – Development and Flood Risk
- v) Planning Policy Wales 10th Edition
- vi) BRE Digest 365
- vii) BS EN 752:2017 Drain and Sewer Systems Outside Buildings
- viii) CIRIA Report C753 (The SuDS Manual (2015))
- ix) CIRIA Report C786 (Culvert Screen and Outfall Manual (2019))

3. Highway Drainage Design

3.1 The design of highway drainage shall be for the following storm return periods:

1 in 2 years	(No surcharge within the system)
1 in 30 years	(No flooding from the system)
1 in 100 years	(Flooding from system temporarily stored on highway or routed to open space, no property shall be flooded).

3.2 The effect of the impact of climate change shall be taken into account on all proposed developments and the above return periods are to be assessed in accordance with Welsh Government advice including Technical Advice Note 15 Development, flooding and coastal erosion.

3.3 During extremely wet weather, the capacity of the highway drainage may be inadequate, even when designed in accordance with this Guide. Under such conditions, highway drainage may surcharge and surface water may escape from those manhole covers which lie below the hydraulic gradient. Checks must be made to ensure that an adequate level of protection against the flooding of properties is achieved and the design adjusted where the required flooding protection is not achieved. This is particularly important on undulating or steeply sloping developments.

3.4 In designing the highway drainage and site layout Developers will also need to demonstrate flow paths and the potential effects of flooding resulting from storm events exceeding the design criteria. Storage of exceedance flows up to the 1 in 100-year storm event must be accommodated within the site via overland flow routing or temporary surface flooding of areas such as car parks or landscaped areas.

3.5 Alternatives to the use of road gullies may be considered as part of a sustainable drainage scheme.

3.6 Road gullies or suitable escape points for surface water run-off must be sited at all valley points. Where a length of road is longer than 200 metres between valley points, two gullies, (or adequate alternative surface water drainage routes), should be provided at the valley point with independent outlets to the main drain. Unless required for a valley point position, gullies should not be sited against the radius kerbs at junctions.

The spacing of any gullies, or surface water escape points to a sustainable drainage system, should be such that each drains no greater an area than 160 sq metre of highway (carriageways and footways).

3.7 Where traditional drainage is used manholes are required at changes of horizontal and vertical alignment and spaced at not more than 100 metre intervals.

- 3.8 Drain pipe sizes should not be less than 225 mm. diameter, except for gully connections, which shall be not less than 150 mm.
- 3.9 No carrier drain shall be laid at a gradient less than 1 in 120 unless a self-cleansing velocity of 0.75m/s can be achieved. However, where attenuation tanks are provided they shall be laid at such gradients that will not cause flooding of the highway prior to fulfilling its function.
- 3.10 Manhole covers should not be positioned under the wheel tracks or within the path of pedestrians at crossing points.
- 3.11 Highway drainage laid under carriageway, footway or highway verge should have a minimum cover of 1.2m measured from the top of the pipe barrel to the finished ground level. Where this is not achievable, the highway drains shall incorporate 150mm thick ST4 concrete bed and surround which shall be interrupted over its full cross section at each pipe joint by a shaped compressible filler complying with BS EN 120 and BS EN 317.
- 3.12 Carmarthenshire County Council will not adopt surface water drainage system, which includes run off from roof, yard, and private shared surfaces. Connection of surface water drainage from roof, yard, driveways and private shared surfaces must not be connected to an existing highway drainage system, without the approval of the highway authority.
- 3.13 Where there is an existing connection of external drainage to the road drainage, either historical or by agreement, the right of connection may be permitted by Carmarthenshire County Council to continue provided that the input from the contributing catchment to the connection remains unaltered.
- 3.14 Assessment of existing land drainage and runoff from catchments adjacent to the road pavement shall be included in the design of highway drainage in accordance with CD 522 [Ref 7.N]. NOTE Runoff can be derived from land both within the overall highways boundary or external to it.
- 3.15 In order to ensure the integrity of road drainage systems, no new runoff that arises due to any change of use of land within the surface water catchment of the road shall be accepted.
- 3.16 Where highway drainage only is intended to discharge into a watercourse, a discharge consent will not be required. However, agreement on the rate of discharge (annual probability or mean annual peak rate of run off) will be required from the Authority.
- 3.17 The authority reserves the right to decline requests for connections into highway drainage systems which discharge onto third party land. Where such requests are approved the authority may require indemnity against third party claims.

- 3.18 A Flood Defence Consent (FDC) will be required from Natural Resources Wales, in respect of any outfall structure required that discharges to main river. An ordinary watercourse consent may be required from the Flood Defence & Coastal Protection team FDCP@Carmarthenshire.gov.uk in respect of any outfall structure which discharge to ordinary watercourse. FDC/OWC must be provided prior to the completion of a Section 38 Agreement or adoption of the streetworks.
- 3.19 Highway drainage that requires the flow to be attenuated will require a commuted sum to cover maintenance of the attenuation and flow control mechanism.
- 3.20 Soakaways will be considered where ground conditions are proven to be suitable in accordance with BRE Digest 365 or alternative agreed procedure and without causing any detrimental harm in the vicinity. Highway soakaways will require a commuted sum payment to cover the future maintenance of the soakaway.

Where highways drainage systems discharge to soakaways, catchpits shall be used throughout the system in lieu of manholes.

- 3.21 Highway drainage systems that are given consent to discharge to an existing highway drain will require the developer to pay a commuted sum towards the increased risk associated with permitting the connection. The commuted sum will contribute towards annual inspections and increased maintenance costs due to the additional loading added to the existing system.
- 3.22 To request a connection of a new highway drainage system to an existing highway drain, developers must in the first instance submit an application in writing to Carmarthenshire County Council's Highways & Transportation Services to include: -
- I. Hydrological assessments and hydraulic calculations of the catchment area for the existing highway drainage to confirm its hydraulic capacity to accept additional discharges.
 - II. A CCTV survey in a digital format of the existing highway drainage to confirm it's structural and service condition (format to be compatible with WDM and AMX formats).
- 3.23 Carmarthenshire County Council will require payment of a fee for review of the submitted information relating to the capacity and suitability of the existing highway drainage system in order to provide consent for connecting to an existing highway drainage system. The fee is set out within this document and is to be paid in advance of any approval and is not refundable. It should be noted that payment of this fee does not guarantee that consent will be granted.

Following approval, a commuted sum will be payable.

- 3.24 A connection charge will also be required to cover staff time / inspection of the connection to the highway drainage system and where required must be paid in advance of any connection being made.
- 3.25 Any diversion or alteration to existing highway drainage or highway culvert will require submission of full details of the proposed changes to Carmarthenshire County Council for approval. Works must not commence until written approval has been given.
- 3.26 Any works to open watercourses or culverts including repairs, improvements or diversion will require a S278 agreement and may require an Ordinary Watercourse Consent, (OWC).

4. Highway Soakaways

- 4.1 Where a developer intends to utilise SuDs and drain highway drainage to soakaways, the developer will be responsible for assessing the size and design of the soakaways together with ground permeability testing in accordance with BRE Digest 365 or alternative agreed method soakaways require regular cleansing, and silt trap manholes cleansed on a regular basis. More specialised equipment is required to cleanse the soakaways due to the high levels of silt and debris deposited in the system whilst water is held back.

5. Oil Interceptor/Separator

- 5.1 An oil interceptor/separator should be provided in parking areas in line with Natural Resources Wales guidelines and in locations where oil/hydrocarbons are likely to be used or stored.
- 5.2 In some circumstances, gully pots may be adequate as long as they are suitable for the frequency of oil contamination and can be properly inspected and maintained.
- 5.3 It is advisable to provide oil interceptor in the delivery areas due to higher risk of oil spill from Lorries.
- 5.4 Oil interceptors/separators which are to be maintained by the Highway Authority will be subject of a commuted sum for the future maintenance.

6. Highway Drainage Vetting and Connection Charges

- 6.1 Where a developer intends to discharge surface water run-off from a newly created development into an existing highway drain, the developer will: -
 - a) In addition to assessing integrity and capacity, determine that the highway drainage does not outfall to the water company's combined sewer.
 - b) Be responsible for determining the extent of the existing highway drainage network, (where records are not available) and assessing

the capacity and integrity of the existing highway drainage to accommodate the net additional flow up to its discharge point.

- c) Be required to pay the Council fees for the vetting and approving of the submitted documents and calculations relating to the drainage system and connection. The fees, which will be subject to periodic review, are currently:

Highway Drainage Connection Approval & Vetting Fees (as of April 2023)		
Development	Vetting & system approval fee	Connection approval fee*
Single Dwelling	£500	£400
Residential developments of not more than 5 units	£500 - £2500 / dwelling	£400
Residential developments of not more than 20 units	£2500 / connection	£400 / connection
Larger residential developments	Subject to individual assessment	Subject to individual assessment
Commercial & Industrial developments	Subject to individual assessment	Subject to individual assessment

Notes:

1. Charges will be subject to review and update.
2. Charges must be paid in advance of any review being made.
3. All works undertaken in the public highway must be undertaken by Carmarthenshire County Council or subject to a Section 278 Agreement.
4. Connection, vetting and approval fees do not include any physical works.
5. All connections must be approved and payment received before being made to the highway drainage system.