

Technical Note	Constructive Thinking
Project Reference:	CC1941
Project Title:	Pencoedtre High School
Description:	PHS CAM SW XX RP C 0120 S3 P01 Drainage strategy technical note
Date:	25/07/2019

Executive Summary

The drainage system for the proposed Penceodtre School will have to be compliant with the Welsh Governments' Statutory standards for sustainable drainage systems – designing, construction, operating and maintaining Surface Water Drainage Systems.

The proposed SuDS drainage system will, wherever possible, seek to comply with all 6 standards set out in the mandatory legislation. The proposed SuDS drainage system will consider numerous SuDS techniques such as rainwater harvesting, filter strips, swales, filter trenches, permeable paving surfaces, bio retention areas, green roofs, detention basins, ponds, wetland areas, infiltration systems, attenuation storage tanks and proprietary treatment systems.

At the time of writing the intrusive site investigation works are ongoing, including infiltration testing. Additional infiltration testing will be carried out if initial testing results show infiltration techniques of drainage are suitable for the site.

At this time, it is anticipated that the surface water runoff will discharge at a restricted rate to the existing surface water outfall located to the south perimeter of the proposed site.

Adopted foul sewers, water mains and surface water drains cross the site, these existing services will be respected/diverted as appropriate. Consultation with Welsh Water has begun and is ongoing.

The proposed foul flows generated from the new development will connect to the existing foul water system, Welsh Water have provided a planning response confirming foul flows from the proposed development can be accommodated in their public sewer.

Surface Water SuDS design

In October 2018, Welsh Government published the 'Statutory standards for sustainable drainage systems – designing, constructing, operating and maintaining Surface Water Drainage Systems'. This standard is now mandatory for new developments with either a construction area greater than 100m² or more than 1 dwelling.

The principles which underpin the design of surface water management schemes to meet the Standards are as follows;

SuDS schemes should aim to;

- Manage water on or close to the surface and as close to the source of the runoff as possible;
- Treat rainfall as a valuable natural resource
- Ensure pollution is prevented at source, rather than relying on the drainage system to treat or intercept it;
- Manage rainfall to help protect people from increased flood risk, and the environment from morphological and associated ecological damage resulting from changes in flow rates, patterns and sediment movement caused by the development;
- Take account of likely future pressures on flood risk, the environment and water resources such as climate change and urban creep;
- Use the SuDS Management Train, using drainage components in series across a site to achieve a
 robust surface water management system (rather than using a single "end of pipe" feature, such as
 a pond, the serve the whole development);
- Maximise the delivery of benefits for amenity and biodiversity;

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- Seek to make the best use of available land through multifunctional usage of public spaces and the public realm;
- Perform safely, reliably and effectively over the design life of the development taking into account the need for reasonable levels of maintenance;
- Avoid the need for pumping where possible; and
- Be affordable, taking into account both construction and long term maintenance costs and the additional environmental and social benefits afforded by the system.
- There are six mandatory standards to be achieved within the National SuDS standards, S1-S6. The following sections demonstrate compliance with each of these standards.

Standard S1 – Surface Water Run-off Destination

This standard reviews the disposal routes for surface water run-off. The destinations are split into 5 levels with level 1 being the most preferential and level 5 being the least preferred and only used in exceptional circumstances.

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

The feasibility of utilising rainwater harvesting systems/rainwater collection systems will be looked at.

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

Infiltration testing has been undertaken and the results show no significant potential for infiltration techniques of drainage. Additional infiltration testing is to be undertaken in accordance with comments from SAB. Where possible infiltration methods of drainage will be utilised in the SuDS design.

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

The nearest surface water body to the development is the brook/stream to the east of the site in Pencoedtre wood. It is proposed to discharge to this watercourse at a restricted rate. The SAB will have to confirm this rate.

Standard S2 – Surface Water runoff hydraulic control

Greenfield Run-off Rates

The Greenfield Runoff rate for the proposed site will be calculated using the FEH method.

Attenuation volumes for the proposed impermeable areas will be calculated using the confirmed runoff rate.

Interception of run-off

Interception mechanisms will be required to ensure compliance with the requirement of zero runoff for the first 5mm rainfall for 80% of storm events during the summer and 50% in winter.

With reference to Table G2.1 'Interception mechanisms with assumed compliance' of the National SuDS standard interception mechanisms will be achieved through the use of infiltration structures, permeable paving, swales, rain gardens, bioretention areas, detention basins and ponds.



Standard S3 – Water Quality

SuDS shall be utilised wherever possible and designed in accordance with the Nation SuDS Standards and The SuDs Manual. The table below identifies suitable SuDS techniques that would be appropriate for the development;

Indicative Suitability	of SuDs Components	within the Management Train
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SuDs Component	Interception	Close to Source/Primary Treatment	Secondary Treatment	Tertiary Treatment	Site Suitability
Rainwater Harvesting	Y				×
Filter Strip	Y	Y			\checkmark
Swale	Y	Y	Y		\checkmark
Filter Trench	Y		Y		\checkmark
Permeable pavement	Y	Y			\checkmark
Bioretention	Y	Y	Y		\checkmark
Green Roof	Y	Y			×
Detention Basin	Y	Y	Y		\checkmark
Pond		Y	Y	Y	\checkmark
Wetland		Y	Y	Y	\checkmark
Infiltration System	Y	Y	Y	Y	\checkmark
Attenuation Storage Tanks	Y				\checkmark
Proprietary treatment systems		Y	Y	Y	\checkmark

A SuDs treatment train solution will need to be incorporated prior to discharging the surface water run-off from the site to avoid detriment to the water quality of the receiving watercourse and runoff through the site.

With reference to the SuDS Manual chapter 26 a simple index approach to water quality risk management will be undertaken. This approach would need to be agreed with the SAB.



Standard S4 & S5 – Amenity & Biodiversity

The aim of the Standard S4 & S5 is to ensure the SuDs scheme makes the best contribution to development design by maximising benefits for amenity and biodiversity as well as water quantity and quality.

Potential above ground features to satisfy this criteria would be the use of swales, rain gardens, bioretention areas, detention basins and ponds, which can be incorporated within soft landscaping areas of the site.

Standard S6 – Design of Drainage for Construction, Operation & Maintenance

A SuDS maintenance plan would need to be provided for all SuDS features and submitted as part of the SuDS application to the Sustainable Drainage Approval Body (SAB).

References:

(1) (2) (3)



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Appendix A

Welsh Water Planning Response PPA0004043



Mr Callum Parker Cambria Consulting Penarth Vale of Glamorgan CF64 1TR Developer Services PO Box 3146 Cardiff CF30 0EH

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> Date: 31/05/2019 Our Ref: PPA0004043

Dear Mr Parker

Grid Ref: 312017 170324 Site Address: Pencoedtre High School, Barry Development: Pencoedtre High School Redevelopment Project

I refer to your pre-planning enquiry received relating to the above site, seeking our views on the capacity of our network of assets and infrastructure to accommodate your proposed development. Having reviewed the details submitted I can provide the following comments which should be taken into account within any future planning application for the development.

APPRAISAL

Firstly we note that the proposal relates to the new Pencoedtre High School, which has no allocated status in the Local Development Plan (LDP), and entails the demolition and redevelopment of the main school building along with associated facilities including new sports fields. Accordingly, whilst it does not appear an assessment has been previously undertaken of the public sewerage system, we offer the following comments as part of our appraisal of this development.

Please note, notwithstanding the following assessment, we would advise there is also a mandatory requirement to undertake pre-application consultation with all 'Specialist Consultees', including Dwr Cymru Welsh Water as the statutory water and sewerage undertaker, in accordance with Schedule 4 of Town & Country Planning (Development Management Procedure) (Wales) (Amendment) Order 2016. As a major development, amounting to an area greater than 1 ha, you will be statutorily required to consult Welsh Water and a substantive response will be issued within 28 days from the date of the notice as per the requirements of Article 2E.

Public Sewerage Network

The proposed development site is located in the immediate vicinity of a separate sewerage system, comprising combined, foul and surface water public sewers, which drains to Cog Moors Wastewater Treatment Works (WwTW).



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Dŵr Cymru Cyf, a limited company registered in Wales no 2366777. Registered office: Pentwyn Road, Nelson, Treharris, Mid Glamorgan CF46 6LY Rydym yn croesawu gohebiaeth yn y Gymraeg neu yn Saesneg

Dŵr Cymru Cyf, cwmni cyfyngedig wedi'i gofrestru yng Nghymru rhif 2366777. Swyddfa gofrestredig: Heol Pentwyn Nelson, Treharris, Morgannwg Ganol CF46 6LY. This site is crossed by a 150mm foul water public sewer with the approximate position being marked on the attached Statutory Public Sewer Record. In accordance with the Water Industry Act 1991, Dwr Cymru Welsh Water requires access to its apparatus at all times in order to carry out maintenance and repairs. Having regard to the submitted 'Proposed Site Zoning' (Drawing No. PHS-HLM-SW-00-GA-L-0001 Rev. P01), it appears the proposed new school building would be situated within the protection zone of the public sewer measured 3 metres either side of the centreline and is corroborated by the annotated easement. However, we acknowledge that this plan also includes reference to a "Redirected Foul Water Sewer" and would appear to be acceptable in principle provided the developer applies to divert the sewer under Section 185 of the Water Industry Act. We therefore recommend that the developer contact our network development engineering team to discuss these proposals at the earliest opportunity, preferably in advance of a planning application being submitted. Further information regarding Asset Protection is provided in the attached Advice & Guidance note.

You are also advised that some public sewers and lateral drains may not be recorded on our maps of public sewers because they were originally privately owned and were transferred into public ownership by nature of the Water Industry (Schemes for Adoption of Private Sewers) Regulations 2011. The presence of such assets may affect the proposal. In order to assist you may contact Dwr Cymru Welsh Water on 0800 085 3968 to establish the location and status of the apparatus in and around your site. Please be mindful that under the Water Industry Act 1991 Dwr Cymru Welsh Water has rights of access to its apparatus at all times.

Foul Water Drainage

In principle, we would advise that foul flows from the proposed development can be accommodated within the public sewerage system and no problems are envisaged with the WwTW for treatment of domestic discharges from this site. We advise that the flows can either communicate to the sewer via the school's existing connection or otherwise should be connected to the aforementioned foul sewer that crosses the development site. However, should you wish for an alternative connection point to be considered please provide further information to us in the form of a drainage strategy, preferably in advance of a planning application being submitted.

You may need to apply to Dwr Cymru Welsh Water for any connection to the public sewer under Section 106 of the Water industry Act 1991. However, if the connection to the public sewer network is either via a lateral drain (i.e. a drain which extends beyond the connecting property boundary) or via a new sewer (i.e. serves more than one property), it is now a mandatory requirement to first enter into a Section 104 Adoption Agreement (Water Industry Act 1991). The design of the sewers and lateral drains must also conform to the Welsh Ministers Standards for Foul Sewers and Lateral Drains, and conform with the publication "Sewers for Adoption"- 7th Edition. Further information can be obtained via the Developer Services pages of www.dwrcymru.com.



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Surface Water Drainage

As of 7th January 2019, this proposed development is subject to Schedule 3 of the Flood and Water Management Act 2010. The development therefore requires approval of Sustainable Drainage Systems (SuDS) features, in accordance with the 'Statutory standards for sustainable drainage systems – designing, constructing, operating and maintaining surface water drainage systems'. As highlighted in these standards, the developer is required to explore and fully exhaust all surface water drainage options in accordance with a hierarchy which states that discharge to a combined sewer shall only be made as a last resort. Disposal should be made through the hierarchical approach, preferring infiltration and, where infiltration is not possible, disposal to a surface water drainage body in liaison with the Land Drainage Authority and/or Natural Resources Wales. It is therefore recommended that the developer engage in consultation with the Vale of Glamorgan Council, as the determining SuDS Approval Body (SAB), in relation to their proposals for SuDS features. Please note, DCWW is a statutory consultee to the SAB application process and will provide comments to any SuDS proposals by response to SAB consultation.

In addition, please note that no highway or land drainage run-off will be permitted to discharge directly or indirectly into the public sewerage system.

Potable Water Supply

A water supply can be made available to service this proposed development. Initial indications are that a connection can be made from the 125mm diameter watermain in NGR 312212, 170468. The cost of providing new on-site watermains can be calculated upon the receipt of detailed site layout plans which should be sent to the above address.

The proposed development is crossed by a 125mm watermain, 2 x 12inch watermains and 1 x 9inch watermains, the approximate positions being shown on the attached plan. Dwr Cymru Welsh Water as Statutory Undertaker has statutory powers to access our apparatus at all times. I enclose our Conditions for Development near Watermain(s). It may be possible for this watermain to be diverted under Section 185 of the Water Industry Act 1991, the cost of which will be re-charged to the developer. The developer must consult Dwr Cymru Welsh Water before any development commences on site.

I trust the above information is helpful and will assist you in forming water and drainage strategies that should accompany any future planning application. I also attach copies of our water and sewer extract plans for the area, and a copy of our Planning Guidance Note which provides further information on our approach to the planning process, making connections to our systems and ensuring any existing public assets or infrastructure located within new development sites are protected.

Please note that our response is based on the information provided in your enquiry and should the information change we reserve the right to make a new representation. Should you have any queries or wish to discuss any aspect of our response please do not hesitate to contact our dedicated team of planning officers, either on 0800 917 2652 or via email at <u>developer.services@dwrcymru.com</u>.



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Yours faithfully,

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Owain George Planning Liaison Manager Developer Services

<u>Please Note</u> that demands upon the water and sewerage systems change continually; consequently the information given above should be regarded as reliable for a maximum period of 12 months from the date of this letter.



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