



Newport Centre, Kingsway

Drainage Strategy Report

Client: Newport City Council and Coleg Gwent

Project Ref: CC2439

Report Revision: P02

CAMBRIA

Report Control Sheet

Client	Newport City Council and Coleg Gwent
Project	Newport Centre, Kingsway
Project ref	CC2439
Document title	Drainage Strategy Report
Document reference	CC2439-CAM-ZZ-XX-RP-C-0001
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Document naming protocol

Project Ref.	Originator	Vol.	Level	Type	Role	Number
CC2439	CAM	ZZ	XX	RP	C	0001

Current issue

Revision	Status	Date	Description	Prepared by	Authorised by
P01	S0	20/06/22	First issue	B Whyman	W D W James
P02	S0	07/07/22	Para 2.2.1, 2.2.2 and Figure 2 updated	B Whyman	W D W James

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1 Introduction

- 1.1.1 Cambria Consulting Ltd. have been commissioned by Kew Planning on behalf of Newport City Council and Coleg Gwent to provide a Drainage Strategy Report in support of an outline planning application for the redevelopment of the Newport Centre site.
- 1.1.2 As a result of the enactment of Schedule 3 of the Flood Water Management Act 2010 by Welsh Government, the development will require Sustainable Drainage/ SAB Approval as well as planning approval in order to be constructed. This report will be developed in further detail prior to progressing the SAB approval process.
- 1.1.3 The objectives of this report are to;
- ▶ Identify suitable outfall locations for the Surface Water and Foul drainage from the proposed development.
 - ▶ Undertake hydraulic calculations to identify peak design flows or restrictions to the development and any subsequent attenuation requirements.
 - ▶ Demonstrate how the development could comply with the New National SUDS design standards, S1 – S6.

2 Site Location & Development Proposals

2.1 Site Location

2.1.1 The site is located between the University of South Wales (USW) Newport and the Kingsway Car park. The site is bounded by the A4042 Usk Way to the east, a service access and taxi rank to the west, Emlyn Street to the south and the Friar's Walk shopping centre to the north west.

2.1.2 The nearest postcode to the site is NP10 1UH and is centered approximately around coordinates E:331424, N:187883. A site location plan is shown in Figure 1 below.



Figure 1 - Site location plan (Google Earth)

2.1.3 The site is currently occupied by the Newport Centre building which is a leisure centre and includes a main hall that can be used for conferences and live music events. The swimming pool is currently closed however the gym is currently operational.

2.2 Proposed Development

2.2.1 Outline permission for the redevelopment of the site for circa 54,000 sqm of flexible floorspace for Educational use, or any other use within Use Classes A1, A2, A3, B1, C1, D1 and D2, with all matters reserved.

2.2.2 The accommodation will be spread over 7 floors and an extract of the proposed site plan is shown in Figure 2 overleaf.



Figure 2 - Extract of Proposed Site Plan (Newport Norse)

3 Existing Topography

- 3.1.1 A topographical survey is currently not available at the time of drafting this report. The site however is assumed to be relatively flat; the majority of the thresholds of the existing building are level with minor ramped approaches. Historic surveys to the south east of the site suggest Usk Way is around 8.6m AOD, with the USW building opposite at 9.12m AOD.

4 Foul Drainage

4.1.1 Welsh Water records plans, shown in Figure 3 below, show a network of combined sewers surrounding the site. A concrete 880mm diameter sewer runs along the northern eastern boundary of the site and is approximately 3m deep. An existing connection is shown to the south west of the site which connects to a 375mm/450mm diameter pipe, approximately 2 – 2.5m deep and runs along the southern boundary connecting to the brickwork 870 x 710mm sewer in Emlyn Street.

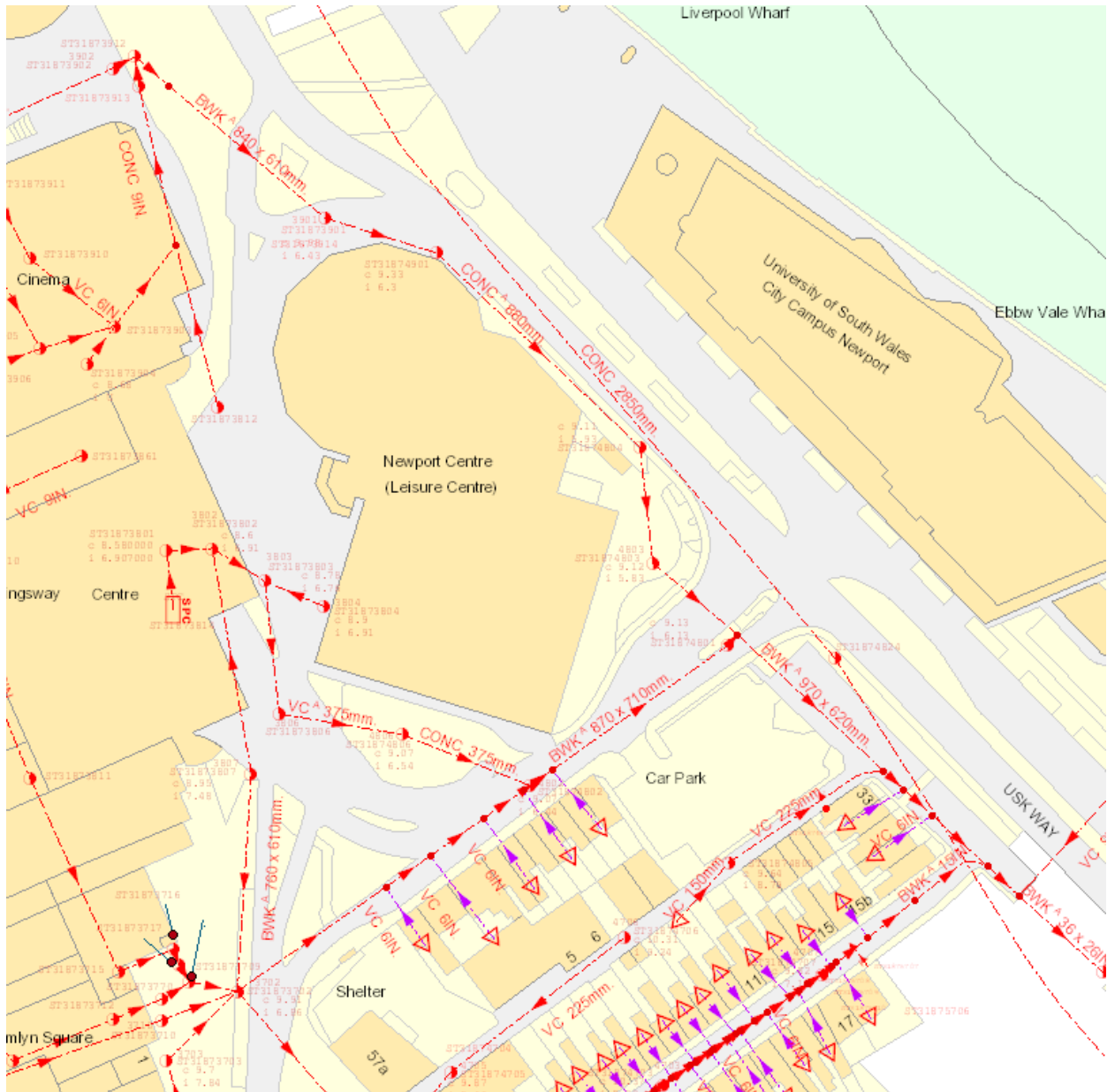


Figure 3 – Extract of Welsh Water Records (DCWW)

4.1.2 When the development mix is known, an estimate of the peak foul flows should be undertaken and pre development enquiry made to Welsh Water to establish whether there is sufficient capacity within the sewerage network to accommodate the development and also agree a point of connection. This assessment should consider existing flows currently generated from the site.

4.1.3 The combined sewers surrounding the site would likely command significant easements. Easement requirements will need be verified with Welsh Water.

- 4.1.4 The existing chamber referenced ST31873804 outside the existing building has a Cover Level of 8.9mAOD and Invert level of 6.91m AOD. It is therefore assumed at this stage the foul drainage for the site can connect via gravity to the combined sewerage network.

5 Surface Water Drainage

5.1.1 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.

5.1.2 The principles that underpin the design of surface water management schemes to meet the standards area 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;
- ▶ 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;
- ▶ Be affordable, taking into account both construction and long-term maintenance costs and the additional environmental and social benefits afforded by the system

5.2 Standard S1 – Surface Water Runoff Destination

5.2.1 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;

5.2.2 The feasibility of a rainwater harvesting system should be assessed once details of the internal layout and function of the building are developed.

5.2.3 Further priority levels will be required to be assessed however as any proposed rainwater harvesting system will be fitted with an overflow connection to the surface water drainage network.

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

5.2.4 A comprehensive intrusive SI investigation will be required which should include BRE Digest 365 tests, groundwater monitoring and contamination testing to assess the feasibility of an infiltration solution.

5.2.5 A site investigation report is currently unavailable for the site, based on the anticipated geology and projects in the surrounding area an infiltration solution is assumed to be unlikely therefore lower priority levels have been appraised.

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

5.2.6 The nearest water body to the site is the River Usk approximately 67m east of the site.

5.2.7 A gravity connection to this watercourse is potentially achievable however the feasibility would need to be assessed once further survey information is obtained. The connection would have to cross Usk Way and be routed around the USW building.

Priority Level 4: Surface water runoff is discharged to a surface water sewer, highway drain or other drainage;

5.2.8 There are no Surface Water sewers identified on the Welsh Water records.

5.2.9 Highway drainage records are not currently available at the time of drafting this report.

5.2.10 An existing surface water outfall currently serves the USW building with an outfall into the River Usk south east of the site.

5.2.11 Drainage surveys will be required to explore all possible connection positions on and off site.

Priority Level 5: Discharge to a Combined Sewer

5.2.12 All higher priority levels will need to be fully explored before considering a connection to the combined sewerage network.

5.3 Standard S2 – Surface Water Hydraulic Control

- 5.3.1 If a new connection is proposed to the River Usk, this may be subject to a free discharge due to it being a tidally influenced water body. This would need to be agreed with the Sustainable Drainage Approval Body (SAB) and Natural Resources Wales (NRW).
- 5.3.2 If the surface water connection utilises an existing system, the capacity will need to be checked and 30% minimum betterment factor would need to be applied to flows from the site assuming the site is currently covered in impermeable area, served by a positive drainage system. Any discharge restriction would need to be agreed with the SAB.

5.4 Standard S3 – Water Quality

- 5.4.1 The areas of the development will generally introduce 'low' and 'medium' pollution hazard level land uses. The roof runoff would likely be classified as low pollution hazard level. The only potential 'medium' pollution hazard level uses would be any delivery or car parking areas.
- 5.4.2 The Simple Index Approach method should be adopted to ensure sufficient treatment measures are in place for 'low' and 'medium' pollution hazard level land uses. This will be provided within the SAB application.
- 5.4.3 As such suitable SUDS measures, in a SUDs treatment train, will be required to ensure the quality of the Surface Water runoff discharging from the site.

5.5 Standard S4 & S5 – Amenity & Biodiversity

- 5.5.1 A landscaping strategy/planting plan will need to be developed once further details are known regarding the proposed building and surrounding external works. Above ground SuDS features will be needed to provide sufficient amenity and biodiversity benefits. A green roof shall be considered if room at ground level is limited.

5.6 Standard S6 - Design of drainage for Construction, Operation and Maintenance and Structural Integrity

- 5.6.1 The development will likely be formed of one property and therefore adoption of the SuDS features by the SAB may not be mandatory.
- 5.6.2 The proposed surface water drainage system will be designed as shallow as possible to reduce construction costs and ease maintenance requirements.
- 5.6.3 All proposed drainage and SUDS features will be subject to a Maintenance Plan which will be submitted as part of the SAB application.
- 5.6.4 All SUDS features will need to be designed and constructed in accordance with CIRIA C753 The SUDs Manual and C768 Guidance on the Construction of SUDs.

6 Conclusions & Recommendations

- 6.1.1 A gravity foul connection can be made to the existing foul connection south west of the site subject to confirmation from Welsh Water.
- 6.1.2 Further survey works are required to inform the preferred disposal route for the Surface Water drainage design.
- 6.1.3 The integration of above ground SUDs at ground level within the external areas of the site should be encouraged and maximised to provide biodiversity and amenity benefits. The feasibility of green roofs and rainwater harvesting systems should be assessed, particularly if space is limited at ground level.
- 6.1.4 The surface water drainage strategy is subject to approval from the SAB.

Recommendations

- ▶ Topographical, utility and drainage CCTV surveys will be required to establish the existing drainage systems on, and adjacent to, the site.
- ▶ A ground investigation including BRE 365 Soakaway tests, groundwater monitoring and contamination testing is required. This however will be constrained by the existing building and facilities resulting in a phased approach.
- ▶ A predevelopment enquiry should be submitted to Welsh Water to confirm capacity within the sewerage network, agree a point connection and confirm easement requirements to the sewers present on site.
- ▶ Once the surveys are completed, the SAB should be consulted at the earliest opportunity to agree the principles of the surface water drainage strategy.