



4 Water Crossing

The proposed access route requires a watercourse crossing of the River Shambles in the form of a 13m clear-span bridge, refer to DBFL drawing 220084-RY-02-Z00-XXX-DR-DBFL-CE-5001 for water crossing detail.

4.1 Bridge Characteristics

The bridge structure consists of MY4 precast concrete bridge beams supported by piled foundations at the abutments. To enhance safety, parapets will be installed on precast edge beams, and guardrails will be provided at both ends of the bridge.

The bridge beam has a depth of 0.5m, and the soffit level is set at 55.99m, which is 1.84m above the 0.1% Annual Exceedance Probability (AEP) Flood level of 54.14m and 2.8m above the 1.0% AEP Flood level of 53.18m, refer to Appendix D :for CRFAM maps.

4.2 Cross Sectional Dimensions

The bridge deck will have a total width of 14m, accommodating various components to cater to different modes of transportation. This includes a 3.6m wide footpath, a 3m wide shared greenway for pedestrians and cyclists, a 6m wide carriageway for vehicles, and a 1.4m wide median.

4.3 Vertical & Horizontal Alignments

The proposed bridge will have a straight horizontal alignment and a flat vertical alignment with a gradient of 0.75%. For effective drainage, a horizontal cross fall of 2.5% will be applied from the bridge centreline to both sides. This ensures proper water runoff and minimizes the risk of water accumulation on the bridge surface.

4.4 Foundation

A Ground investigation has been undertaken as described in Section 1.6. A summary of the findings at the bridge location is summarised below.

Rock testing was carried out on 6 samples recovered from the two boreholes BH01 and BH02, which presented the following soil composition: At BH01 firm grey gravelly CLAY was identified within the range of 1.10 to 3.20 meters, followed by very stiff gravelly CLAY and dense GRAVEL from 4.00 to 4.60 meters. Solid limestone bedrock was encountered at depths of 7.50 meters.

Similarly, BH02 successfully reached a depth of 2.20 meters by penetrating through MADE GROUND, revealing an overlay of stiff grey gravelly CLAY and GRAVEL from depths 3.50 to 4.40



meters. This investigation also confirmed the presence of bedrock at a depth of 7.50 meters below ground level.

While traditional methods for abutment construction remain viable, piled foundations are proposed to support the bridge as the presence of limestone bedrock at 7.50 meters, presents an ideal foundation for piling.

4.5 Hydrology and hydraulic Summary

An OPW Section 50 application for the proposed bridge will be submitted in parallel with this planning application. The Section 50 application demonstrates that the bridge meets required design standards and utilized flood modelling to establish a sufficient freeboard between the bridge soffit level and the estimated flood level.

5 Surface Water Drainage

5.1 Existing Surface Water

The topography of the site generally slopes from North to South. Surface water drainage within the vicinity of the proposed development comprises the following;

- MCC service records indicate that there is no existing public stormwater network within the subject site or in close proximity to the subject site, see Appendix E :for MCC records.
- The Shambles river runs through the southern section of the subject site and flows in West-East direction discharging into the Blackwater river 1.5km downstream, refer to Figure 5-1.

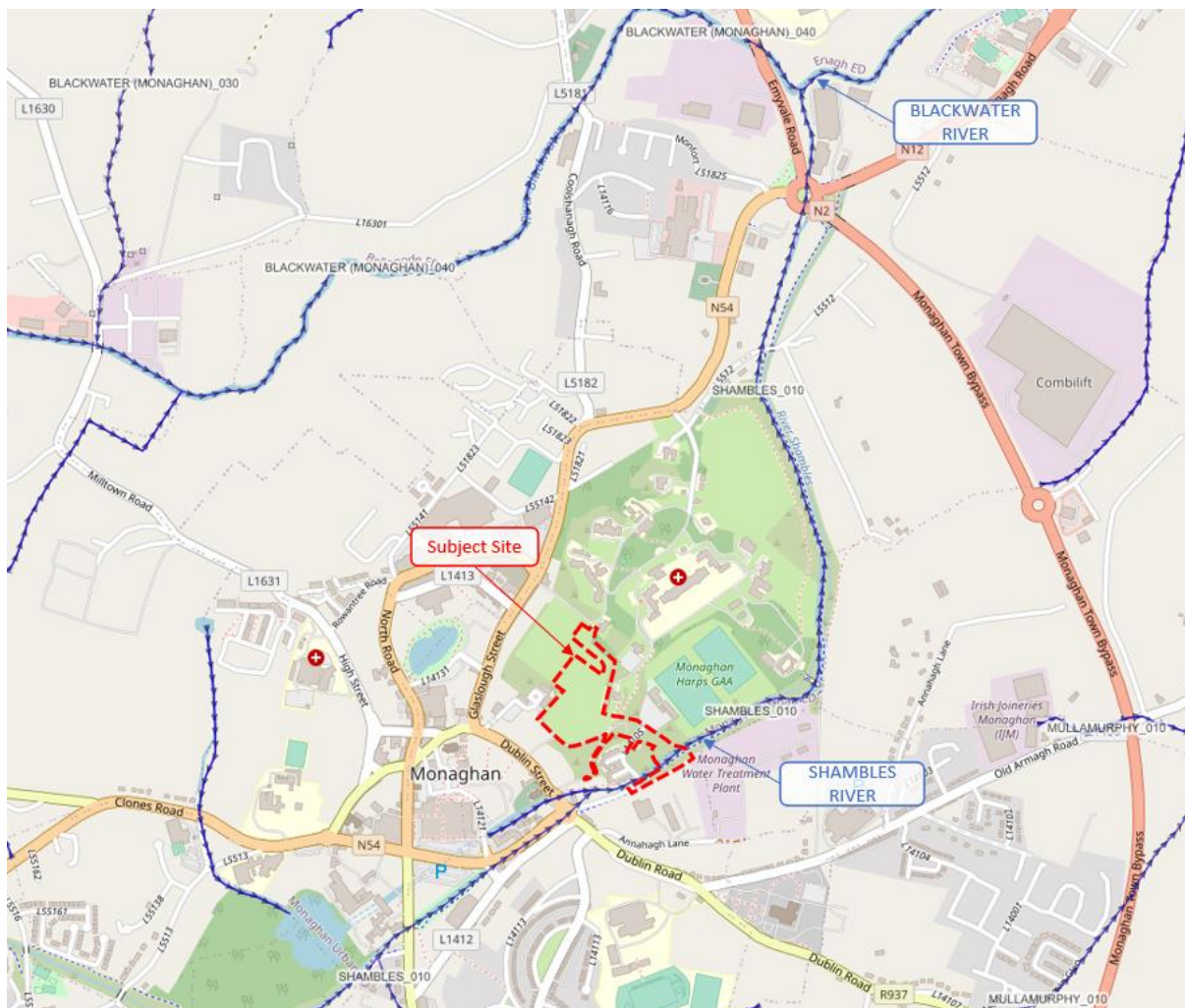


Figure 5-1: Blackwater river EPA map

5.2 Surface Water Catchments

The total Catchment area draining to the proposed surface water network is 4.66ha. The catchment is be split into 4 surface water catchments, where catchment 1A is located South of the

Shambles river and Catchments 1B, 1C and 2 are located North of the Shambles river, refer to Figure 5-2: Surface water Catchments below which outlines the location of each surface water.

Catchment 1A has a total area of 0.2ha of which the contributing run off area is from the Slí Ógie Uí Dhufaigh road extension. Catchment 1B has a total area of 0.64ha of which the contributing run off area is from the Quarry walk access link. Catchment 2 has a total area of 3.82ha of which the contributing run off area is from the Civic office project and future development area. Catchment 1C is a small area (0.07ha) serving only the upgraded Davnets Row, and it discharges via infiltration.

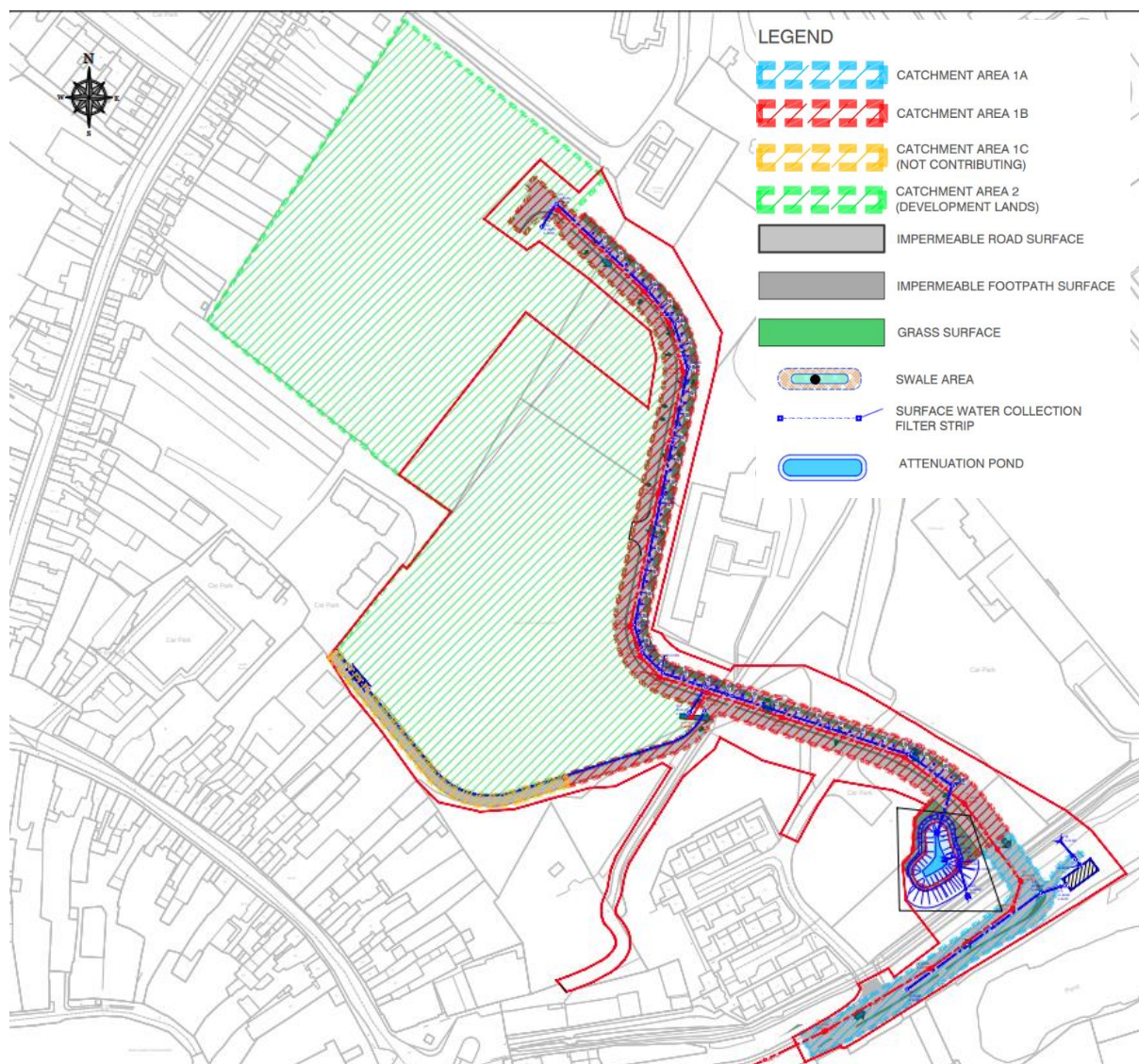


Figure 5-2: Surface water Catchments



5.3 Surface Water Drainage Strategy

The overall proposed drainage strategy primarily collects runoff from the subject site via Sustainable Urban Drainage Systems and then through piped systems which route to attenuation storage areas. Surface water runoff from the subject site will be attenuated to Qbar "Greenfield Runoff" as required in the GDSDS, with runoff exceeding the allowable outflow stored on site for up to a 1% AEP (Annual Exceedance Probability) event, plus 20% for climate change. Outflows are then routed through petrol interceptors before discharging to the Shambles River. The drainage network is intended to serve the Civic Office site and other future development lands within the Roosky Masterplan area as per the catchment plan. However, these developments shall be required to have their own on-site flow controls and attenuation prior to discharging to the road network.

5.3.1 Southern Catchment (1A)

The stormwater system is designed to effectively drain the road (catchment 1A) area of 0.2ha. This runoff is attenuated in an underground cellular storage system with a flow restrictor to limit discharge to 2l/s. The discharge will flow through a petrol interceptor before discharging to the Shambles River.

5.3.2 Northern Catchment (1B & 2)

The stormwater system is designed to facilitate the efficient flow and management of surface water from the combined catchments 1B (0.64ha) and 2 (3.82ha)

In addition to the roadway/active travel links, the drainage network is intended to serve the Civic Office site and other future development lands as per the catchment plan however these developments shall be required to have their own on site flow controls and attenuation prior to discharging to the road network.

Quarry Walk road access is designed with a cross fall which directs runoff toward kerb inlets which allow runoff to flow directly from the road surface into the grass swale SuDS feature that runs along the length of Quarry Walk.

Footpaths and Cycle path along the road access are to direct run-off over the adjacent grass verge for infiltration and onwards to carriageway surface .

The proposed swale is a shallow vegetated channel, that conveys runoff from catchment 1B discharge points along the stormwater network to the outfall point. Check dams are to be located along the swale to provide additional attenuation and to prevent erosion.