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Project title	New Victoria	Job number
		255644
cc	MCC	File reference
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Prepared by	Emma Cecil	Date
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Subject	2019 Update on Surface Water Drainage Strategy	

1 Introduction

This should be read in conjunction with the original Arup Drainage Strategy (2016), which formed part of the planning submission, for full details of the existing site drainage regime and the agreed design criteria for the surface water and foul networks.

As the design for New Victoria has progressed some of this Strategy has been developed further. This Note sets out the updated information for the Surface Water Drainage Strategy.

The surface water drainage network layout for the New Victoria site is provided on the drawing VIC-ARUP-P1-EX-DR-CD-2001 for Phase 1 of the scheme.

2 Design Updates

2.1 Catchments

At the time that the original drainage strategy was produced, the proposed surface water drainage scheme had three catchments, each with their own network, petrol interceptor and attenuation storage tank. During WS3 these have been rationalised to two in order to negate a new connection into the culvert for the proposed surface water (as indicated on the accompanying drawing VIC-ARUP-P1-EX-DR-DC-2001 RevP4). The two proposed surface water catchments (see Figure 1) are:

- Catchment 1: Residential Block 1 and northern car park areas - drain to the River Irk culvert via Network Rail's outfall pipe
- Catchment 2: Residential Block 2, the Phase 2 Office Block and remaining southern car park areas - drain the River Irk culvert via the existing UU CSO – further details of UU consultation and proposed ownership is described below.

File Note

255644

16 May 2019

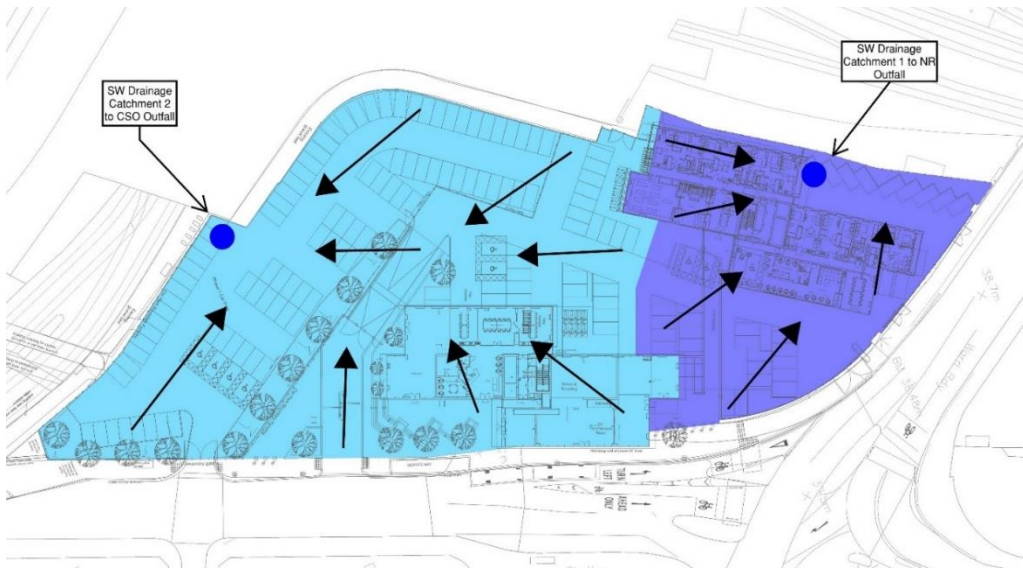


Figure 1 - Surface Water Drainage Catchments

2.2 Phase 2 Allowance

Phase 2 development involves the construction of an office building adjacent to the Metrolink and Corporation Street. This is not presently being progressed by the developer.

The Phase 1 drainage scheme has been designed to account for Phase 2 with regard to network sizing, levels and layout. The basement of the Phase 2 office is approximately 1m lower than the Phase 1 of the carpark, making these the critical ground levels in terms of flooding, and so the network has been designed to accommodate Phase 2. Connection stubs in two locations constructed during Phase 1 will retain flexibility for the office block connection, depending on the final pile foundations design. As Phase 1 is hardstanding car park and Phase 2 is impermeable office building, the run off rates and therefore attenuation requirements remain the same for both.

2.3 Surface Water Drainage Hierarchy

Infiltration

Arup's Ground Investigation Report concluded that the Made Ground across the site has elevated concentrations of contaminants, with a potential risk to future site users arising from exposure to soils in soft landscaping areas. Therefore, infiltration will not be used to discharge the surface water from this Site.

Planning conditions 28 and 32 restrict infiltration without the written consent of MCC due to the ground contamination. The drainage of the few soft landscaped areas has been discussed and agreed with MCC as acceptable via infiltration and, therefore, these areas do not require active drainage.

Surface Water Body

It is proposed that New Victoria discharges via existing sewers to the River Irk which passes through a culvert beneath the site.

File Note

255644

16 May 2019

Agreement in principles have been obtained from Network Rail and UU to discharge our site into their existing sewers, the formalised approvals are in progress.

A Bespoke Permit has been granted from the EA for the development of New Victoria as it is within 8m of a Main River. However, we are utilising existing outfalls to the culvert and so will not be discharging directly to the river nor working on the structure to construct new outfalls.

2.4 SuDS

New Victoria is heavily constrained by the River Irk culvert which passes beneath the site (see drawing VIC-ARUP-P1-EX-DR-CD-2001). This has minimal cover (1-1.2m) and so eliminates the potential for swales etc in this area. There is also the requirement to not cause additional loading on this structure.

To avoid the structural pile caps, and act as wind mitigation, the trees within the site are in raised planters. Therefore, generally, it is not possible to utilise these as bioretention tree pits within the drainage network.

We have been able to get one of the tree pits to be able to operate as a bioretention tree pit – this is at the base of the ramp where levels allow this to work. The design has now been modified to discharge the ramp gullies into a raised tree pit, which has the potential to overflow back into the network rather than infiltrate into the ground. This is illustrated on drawing VIC-ARUP-P1-EX-DR-CD-2001. The investigation of potential SuDS locations and the constraints on the site have been discussed with MCC.

2.5 Flow Rates

The New Victoria site is very congested due to the River Irk culvert beneath. Between the culvert and the building foundations, there is little remaining space in which attenuation storage can be provided. We have maximised Catchment 1 where there is more available space to provide attenuation, in order to minimise the volume of tanks required for Catchment 2 where space is most limited. The contractor involved to date previously expressed concerns as to the health and safety implications associated with the buildability of these tanks in such a constrained space (currently 4m deep). Reducing the surface water runoff rates would reduce the required attenuation tank volumes, reducing excavation depths and the proximity to culvert/piles.

It has therefore been agreed with MCC to reduce the runoff rate restriction to 30%. Whilst there is a 30% reduction in the 1 in 2 year storm event, there is still a >60% reduction for the larger storm events, and so on average a >50% betterment would still be achieved.

Storm return period (year)	Pre-development rate (l/s)	Discharge limit (l/s) to provide a 30% reduction beyond existing	MicroDrainage modelled site discharge rate (l/s)	Percentage site reduction from existing
2	65	46	45	31%
30	123	86	47	62%
100	157			
100 + 20% CC	-	110	48	69%

File Note

255644

16 May 2019

DOCUMENT CHECKING (not mandatory for File Note)

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