

This File Contains 2 Sets of Supplementary Materials, Including Supplement A (SA) And Supplement B (SB).

Supplement A (SA).

This supplement contains detailed information related to the Company A case study, including catchment area and sizes (Table SA1), and the information related to the technical details of the proposed retrofits (Tables SA2–SA4) accompanied by the associated text.

Table SA1. Catchment areas and sizes.

Catchment Area	Size (m²)	Area Type	Size (m²)
Road	669	Impermeable	2174
Car Park	339		
Delivery Yard	686		
Half of Roof	480		
Storage Yard	3110	Permeable	4642
Rough Ground	1532		
Total site area (m²)			6816

Table SA2. SUDS feature sizes for the Company A case study. Units of measurement for Column 4 in description of Column 3.

Catchment	Catchment Size (m ²)	Feature & Unit of Measurement	Recommended Size
Delivery yard	686	Swale (m)	20
		Excavation for filter strip 1.5m depth (m ³)	54
		Filter strip of 1m width (m ²)	36
Storage yard	3110	Inspection chambers 0.6m width x 0.6m depth (m ³)	0.60
Storage yard and additional road catchment	6220	Detention basin (m ³)	127

Table SA2 shows the sizes of the proposed features. For the length of the rectangular detention basin a length of 20 m was used. This is half the length of the Company A boundary with the proposed site of the detention basin. Given the size of the green space available (~22 m from Company A boundary to road),

it could be substantially bigger to serve a much greater area than that shown in Figure 8 but with an increased cost.

The recommended parameters for swales are base width of 0.5-2 m, normal maximum depth of 0.4-0.6 m and a maximum slope of 1 in 3 with preferred slope of 1 in 4 [6].

For the swale serving the delivery yard, the base width is set at 0.4 m with a slope of 1 in 3. These parameters were chosen so that the width at the top of the swale (1.9 m) would be equal to the width of the available green space.

These sizes have been used to determine the attenuation storage of the swale with an engineered soil depth of 0.15 m and porosity of 0.3. Table SA3 gives the volume of the available storage.

Table SA3. Attenuation storage for swale serving delivery yard.

Surface storage		Ground storage	
Depth of water (m)	0.4	Engineered soil depth (m)	0.15
Base width (m)	0.50	Porosity of soil	0.3
Base length (m)	20.12	Overall width (m)	2.11
Base area, A1 (m ²)	10.06	Swale length (m)	20.12
Top width (m)	1.90	Total swale plan area (m ²)	42.55
Top length (m)	20.12	Storage volume (m ³)	6.38
Top area, A2 (m ²)	38.28	Available attenuation storage (m ³)	1.91
Storage volume, V1,2 (m ³)	9.67		
Total storage from swale (m ³)		11.6	

The detention basin for the Company A site was calculated considering the additional catchment. Given that the green space is outside the Company's boundary, there could be logistical problems constructing a basin only for Company A use. The basin size for the length-width ratio of 3:1 is given in Table SA4. A basin base width of 5.3 m was chosen as this provides the minimum dimensions to provide the minimum required storage. The surface area and the volume of this feature have been estimated as 170.9 m² and 131.4 m³ respectively.

Table SA4. Dimensions of the proposed detention basin serving Company A and the adjacent area.

Minimum recommended volume (m³)	127.39
Ratio	3
Base width (m)	5.3
Base length (m)	15.9
Base area, A1 (m ²)	84.27
Top width (m)	8.81
Top length (m)	19.41
Top area, A2 (m ²)	170.9
V1,2 (m ³)	131.4

Supplement B (SB).

This supplement contains additional Tables and Figures related to the Company B case study.

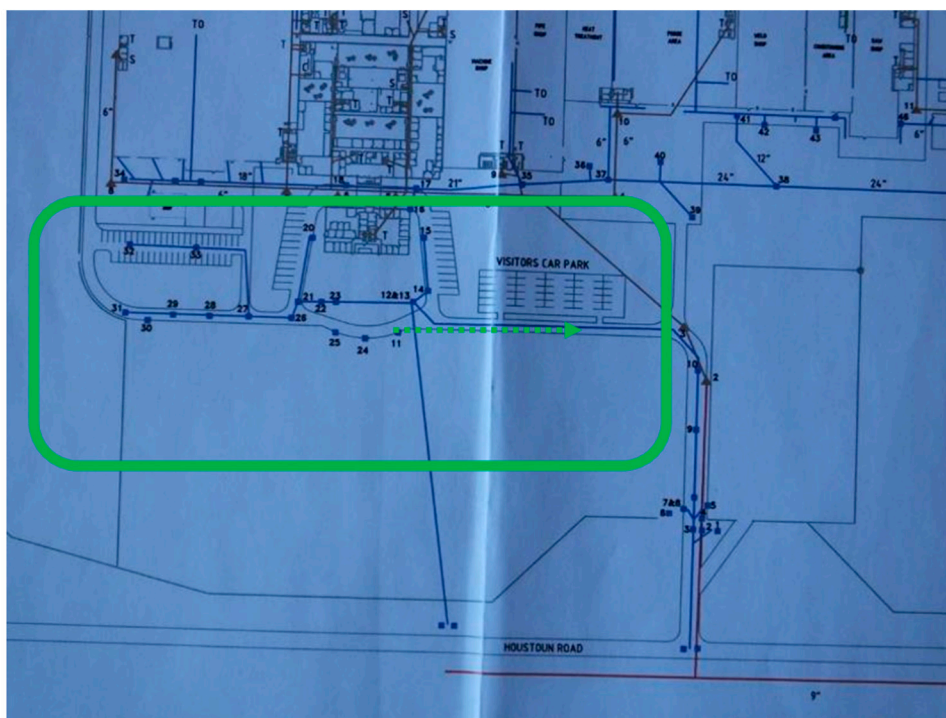


Figure SB1. Drainage plan showing area (within green boundary) of Company B which does not drain to the ponds and is the location of a proposed swale retrofit identified by a green arrow.

Table SB1. Dimensions of the grass verge for conversion to a source control swale.

	Catchment Type	Length	Width	Area (m ²)
Road & associated hard standing	Impermeable	-	-	2306
Grass verge	Permeable	63.2	2.5	158
			Total	2464

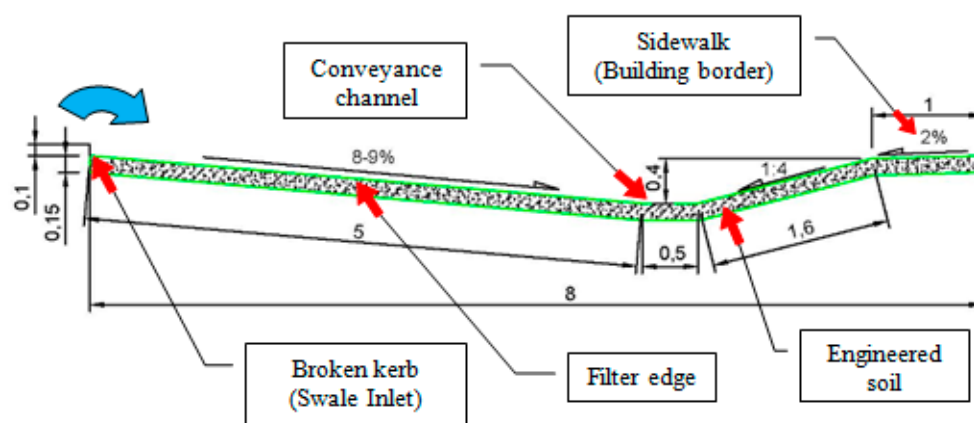


Figure SB2. Layout and design details of a potential swale serving the roads within the fenced perimeter. Note asymmetrical cross section profile with long grass filter strip as side slope to provide filtration of road runoff and conveyance, with minimal land requirement.

Table SB2. Dimensions of a potential swale adjacent to the boundary road

	Catchment Type	Length (m)	Width (m)	Area (m ²)
Road	Impermeable	111	7	777
Grass	Permeable	111	8	888
			Total	1665

Table SB3. Section area and storage volume of boundary road swale

	Section Area (m ²)	Length (m)	Storage Volume (m ³)
Surface storage	1.5	111	166.5

	Porosity	Section Area (m ²)	Length (m)	Storage Volume (m ³)
Ground storage	0.3	1.2	111	40

Total Storage Volume (m ³)	206.5
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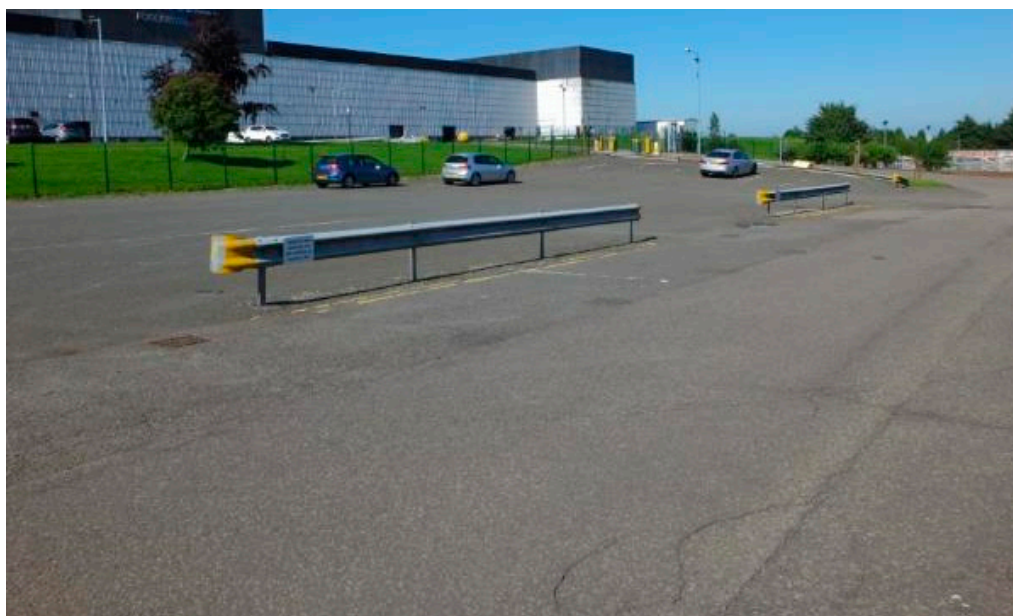


Figure SB3. Visitor car parking area at Company B. The runoff, in part, drains across the road towards the grass verge shown in Figure 15. Note the potential for in-ground raingardens or tree-pits.

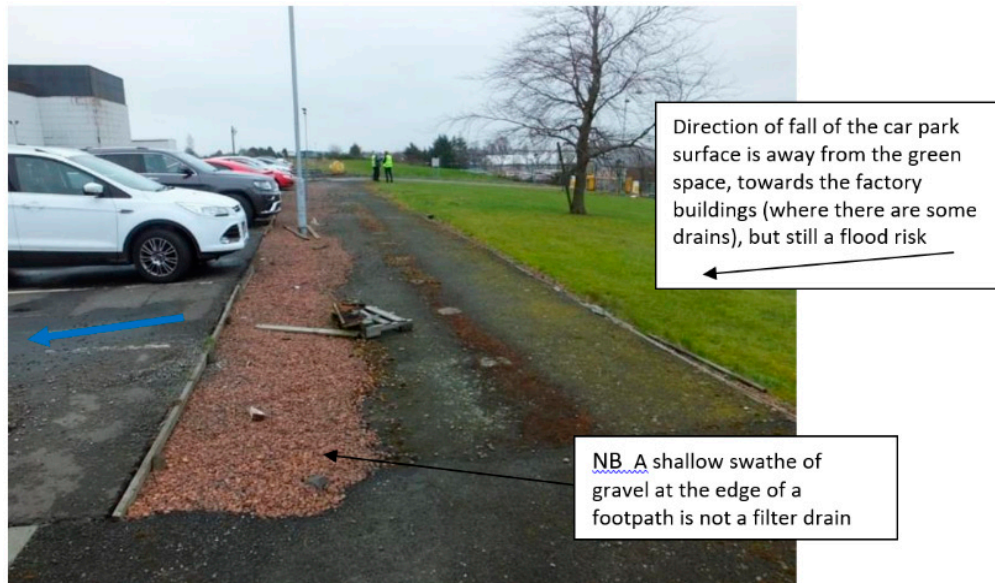


Figure SB4. Car parking area inside boundary fence, above grass bank.