Horndean Road,

Emsworth

Water Quality Management Manual

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CONTENTS

1.0 WATER QUALITY 4

Table 1: Analysis of required pollution hazard indices to indices achieved 6

Appendix A CIRIA C753 Tables

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1.0 WATER QUALITY

1.1 The water quality management for the surface run off from the proposed development has been designed in accordance with the requirements set out in CIRIA C753 the SuDS Manual.

1.2 Table 4.3 of CIRIA C753 (**Appendix A)** defines the minimum water quality management for discharges to receiving waters.

1.3 Referring to Table 4.3 the proposed development has the following land uses;

- Residential roofs;
- Individual property driveways;
- Residential car parks;
- Low traffic roads (e.g. cul de sacs, general access roads)

1.4 Based on these land uses, Table 4.3 indicates that the simple index approach can be adopted for discharge to surface waters for water quality management.

1.5 Box 26.2 from CIRIA C753 (**Appendix** A) outlines the 3 steps to apply the simple index approach.

1.6 Based on this approach for the individual steps the information is obtained as follows;

Step 1

Table 26.2 of CIRIA C753 (**Appendix A**) defines the pollution hazard indices for the proposed land use for total suspended solids (TSS), metals and hydrocarbons.

Step 2

Table 26.3 of CIRIA C753 (**Appendix A**) defines the total mitigation index for the pollution hazard index.

1.7 The surface water run off for the development has been designed utilising SuDS components as follows;

- Residential Roofs discharges to pervious paving sub-base;
- Individual property driveways discharge/infiltrate into pervious paving sub-base;
- Residential car parks discharge/infiltrate into pervious paving sub-base;
- Low traffic roads run off is collected by drains and discharges into pervious paving sub-base.

It should be noted that;

- No surface water run off discharges directly to surface waters.
- The surface water discharge from the site is restricted to the greenfield run off rate.

1.8 The following Table 1 indicates the analysis of land use and it pollution hazard indices to the SuDS components utilised;

	Total suspended solids (TSS) Table 26.2	Total suspended solids (TSS) Table 26.3	Metals Table 26.2	Metals Table 26.3	Hydro-carbons Table 26.2	Hydro-carbons Table 26.3
Land use	**Required**	**Achieved**	**Proposed**	**Achieved**	**Proposed**	**Achieved**
Residential roofs	0.2	0.7	0.2	0.6	0.05	0.7
Individual property driveways, residential car parks, low traffic roads (eg cul de sacs,homezones and general access roads) and non-residential car parking with infrequent change (eg schools, offices) ie<300 traffic movements/day	0.5	0.7	0.4	0.6	0.4	0.7

Table 1: Analysis of required pollution hazard indices to indices achieved

Appendix A

TABLE 4.3 **Minimum water quality management requirements for discharges to receiving surface waters and groundwater**

Land use	Pollution hazard level	Requirements for discharge to surface waters, including coasts and esturies[2]	Requirements for discharge to groundwater
Residential roofs	Very low	Removal of gross solids and sediments only	
Individual property driveways, roofs (excluding residential) residential car parks, low traffic roads (eg cul de sacs, homezones, general access roads), non-residential car parking with infrequent change (eg schools, offices)	Low	Simple index approach[3] *Note: extra measures may be required for discharges to protected resources[1]*	
Commercial yard and delivery areas, non-residential car parking with frequent change (eg hospitals, retail), all roads except low traffic roads and trunk roads/motorways	Medium	Simple index approach[3] *Note: extra measures may be required for discharges to protected resources[1]*	Simple index approach[3] *Note: extra measures may be required for discharges to protected resources[1]* In England and Wales, Risk Screening[4] must be undertaken first to determine whether consultation with the environmental regulator is required. In Northern Ireland, the need for risk screening should be agreed with the environmental regulator.
Trunk Roads and motorways	High	Follow guidance and risk assessment process set out in HA (2009)	
Sites with heavy pollution (eg haulage yards, lorry parks, highly frequented lorry approaches to industrial estates, waste sites), sites where chemicals and fuels (other than domestic fuel oil) are to be delivered, handled, stored, used or manufactured, industrial sites	High	Discharges may require an environmental licence permit[3]. Obtain pre-permitting advice from the environmental regulator. Risk assessment is likely to be required[5].	

Notes

The minimum water quality management requirements for discharges to receiving surface waters and groundwater are presented here. (For Northern Ireland, this guidance should be considered as interim until such time as Northern Ireland publishes its own legislation/policy/guidance)

1. These are not required in Scotland and Northern Ireland. For England and Wales see step 3 of the simple index approach (Section 26.7.1).
2. In Scotland, the Water Environment (Controlled Activities) (Scotland) Regulations (CAR) 2011 General Binding Rules, Rule 10 (d) (iv) effectively provides an exemption from requiring SuDS for coastal discharge. However, control of any contaminants likely to be present in surface water runoff is still required, but can be delivered using alternative methods such as proprietary treatment products. As the tern 'SuDS' in this manual includes proprietary treatments products, this exemption is not valid in this context.
3. The application of the simple index approach should follow the approach outlined in Section 26.7.1 (or equivalent approved).
4. Risk screening is an assessment to identify high risk scenarios where the Environment Agency or Natural Resources Wales (NRW) would wish to be consulted regarding infiltration of water from surface runoff in order to agree the proposed design approach. The risk screening method is provided in Section 26.7.2.

5. The risk assessment should determine the appropriate design approach to mitigate risk to acceptable levels following the guidance outlined in Section 26.7.3. This assessment should be approved by the environmental regulator.

BOX 26.2

Steps of the simple index approach

Step 1 – Allocate suitable pollution hazard indices for the proposed land use

Step 2 – Select Suds with a total mitigation index that equals or exceeds the pollution hazard index

Step 3 – Where the discharge is to protected[1] surface waters or groundwater, consider the need for a more precautionary approach

Note:

1.Designated as those protected for the supply of drinking water (Table 4.3)

TABLE 26.2 **Pollution hazard indices for different land use classification**

Land use	Pollution hazard level	Total suspended solids (TSS)	Metals	Hydro-carbons
Residential roofs	Very low	0.2	0.2	0.05
Other roofs (typically commercial industrial roofs)	Low	0.3	0.2 (up to 0.8 where there is potential for metals to leach from the roof)	0.05
Individual property driveways, residential car parks, low traffic roads (eg cul de sacs,homezones and general access roads) and non-residential car parking with infrequent change (eg schools, offices) ie<300 traffic movements/day	Low	0.5	0.4	0.4
Commercial yard and delivery areas, non-residential car parking with frequent change (eg hospitals, retail), all roads except low traffic roads and trunk roads/motorways[1]	Medium	0.7	0.6	0.7
Sites with heavy pollution (eg haulage yards, lorry parks, highly frequented lorry approaches to industrial estates, waste sites), sites where chemicals and fuels (other than domestic fuel oil) are to be delivered, handled, stored, used or manufactured: industrial sites: trunk roads and motorways[1]	High	0.8[2]	0.8[2]	0.9[2]

Notes

1. Motorways and trunk roads should follow the guidance and risk assessment process set out in Highways Agency (2009).
2. These should only be used if considered appropriate as part of a detailed risk assessment – required for all these land use types (Table 4.3). When dealing with high hazard sites, the environmental regulator should first be consulted for pre-permitting advice. This will help determine the most appropriate approach to the development of a design solution.

Where a site land use falls outside the defined categories, the indices should be adapted (and agreed with the drainage approving body) or else the more detailed risk assessment method should be adopted.

Where nutrient or bacteria and pathogen removal is important for a particular receiving water, equivalent indices should be developed for these pollutants (if acceptable to the drainage approving body) or the risk assessment method adopted.

TABLE 26.3 **Indicative SuDS mitigation indices for discharges of surface waters**

	Mitigation indices[1]		
Type of SuDS component	**TSS**	**Metals**	**Hydrocarbons**
Filter strip	0.4	0.4	0.5
Filter drain	0.4[2]	0.4	0.4
Swale	0.5	0.6	0.6
Bioretention system	0.8	0.8	0.8
Permeable pavement	0.7	0.6	0.7
Detention basin	0.5	0.5	0.6
Pond[4]	0.7[5]	0.7	0.5
Wetland	0.8[3]	0.8	0.8
Proprietary treatment systems[5,6]	These must demonstrate that they can address each of the contaminant types to acceptable levels for frequent events up to approximately the 1 in 1 year return period event, for inflow concentrations relevant to the contributing area.		

Notes

1. SuDS components only return these indices if they follow the design guidance with respect to hydraulics and treatment set out in the relevant technical component chapters.
2. Filter drains can remove coarse sediments, but their use for this purpose will have significant implications with respect to maintenance requirements, and this should be taken into account in the design and Maintenance Plan.
3. Ponds and wetlands can remove coarse sediments, but there use for this purpose will have significant implications with respect to the maintenance requirements and amenity value of the system. Sediment should normally be removed upstream, unless they are specifically designed to retain the sediment in a separate part of the component, where it cannot easily migrate to the main body of water.
4. Where a wetland is not specifically designed to provide significantly enhanced treatment, it should be considered as having the same mitigation indices as the pond.
5. See Chapter 14 for approaches to demonstrate product performance. A British Water/Environment Agency assessment code of practice is currently under development that will allow manufacturers to complete an agreed test protocol for systems intended to treat contaminated surface water runoff. Full details can be found at **http://tinyurl.com/qf7yuj7**

6 SEPA only considers proprietary treatment systems as appropriate in exceptional circumstances where other types of SuDS component are not practicable. Proprietary treatment systems may also be considered appropriate for existing sites that are causing pollution where there is a requirement to retrofit. SEPA (2014) also provides a flowchart with a summary of checks on suitability of a proprietary system.