

NOLA DESIGN - TECHNICAL RESPONSE TO THE COMMENTS RAISED BY THE ECOLOGIST OF EASTLEIGH BOROUGH COUNCIL – Prepared by Rob Colins on 16/03/2023.

Ecology response for F/22/93970 THORNEYDOWN FARM, MOORHILL ROAD, WEST END, SOUTHAMPTON, SO30 3AY

Change of use of land for the siting of touring caravans, motorhomes and tents including a small amenity block and the terracing of the site to accommodate roads, parking and pitches (where appropriate)

Summer Sharpe

9/11/22

1. SuDS

- 1.1 *I have reviewed the Drainage Statement by NOLA Design (September 2022) and note the statement that the underlying clays will not support infiltration.*

Response – The underlying soils will not support infiltration.

- 1.2 *As the site is 1.5 ha, at least three forms of above ground naturalised filtration are required for all surface water drainage in line with Local Plan policy DM 6.*

Response – Refer to the following responses under 1.3 below.

- 1.3 *The current proposal is for porous gravel blankets to each touring pitch, filter drains at the base of each terraced slope leading to a main carrier drain on each access road, cellular attenuation crates under three camp sites and then into a 225 mm diameter pipe discharging the water off site. None of these are above ground forms of naturalised filtration.*

Response – The following are extracts from Eastleigh Borough Local Plan 2016-2036 are addressed below

5.33 Naturalised forms of filtration include, green roofs, vegetated swales, attenuation areas and basins, ponds, rain gardens and wetlands. Other more mechanised forms can be used to drain the urban area on the larger sites provided the three naturalised forms are present at the end of the treatment train. In sites where sites are draining to natural wetland habitats or wet woodland before entering the river, the flows of site will need to mirror the natural hydrological pathways.

In response to separate consultation the plans have been amended to avoid an identified area of marshy grassland which will be retained and allowed to extend naturally. This provides an improved form of natural filtration at the site.

A flow control device will be installed on the outlet to the crated attenuation area which will control flows to comply with the 100yr storm and a 40% allowance for climate change.

Unfortunately, it is not feasible to provide any further form of natural filtration. It will not be practical to construct swales instead of filter drains between the terraces due to the existing slope of the site. All filter drains (including those which will drain the access roads), will be constructed such that the stone surround to the perforated pipes will extend to the surface. This provides a more acceptable method to trap pollutants compared to vegetated swales while also providing filtration and attenuation. Policy DM6 allows for non-naturalised forms of filtration where natural forms are not feasible, and we understand that the site proposals when taken as a whole will achieved greater than 10% net bio-diversity gain.

5.35 Surface water run-off should be managed as close to its source as possible, and as high up in the following hierarchy as reasonably practicable: 1. Into the ground (infiltration) 2. Into a surface water body 3. Into a surface water sewer, highway drain or other drainage system 4. Into a combined sewer

Underlying soils will not support infiltration and there are no surface water sewers close to the site. Therefore, in accordance with the level of the hierarchy, surface water runoff will be discharged into a surface water body (i.e. the existing vegetated ditch along the northern site boundary at existing grassland run-off rates).

5.39 To avoid disputes over the maintenance of watercourses, to protect them from future interference and to ensure access is available for maintenance, the layout of major sites should be designed so that no gardens back on to the watercourse and there is no development within distance of at least 8 metres from the top of the bank. Wider buffer strips may be appropriate for larger watercourses. Such buffer strips should form part of the landscape framework for the site.

There is very little of the proposed 'development' within 8m of the adjoining watercourses. Nonetheless, as this application is a proposal for touring caravan pitches with no gardens and not for dwelling houses with private gardens this small development does not justify the need to apply the 8m stand-off buffer zone. Moreover, the existing watercourses are only minor ditches as opposed to major watercourses and do not merit consideration in relation to this policy.

1.4 This site will have pollutants from vehicle traffic and possibly other pollutants that must be filtered out of the surface water drainage before it leaves the site.

Response –Any pollutants from traffic using the access roads will be discharged from the bonded gravel road surface into the adjacent filter drain comprising a perforated pipe with stone surround which will extend up to the surface, this will intercept and filter out any pollutants before flows reach the attenuation crates. As the new touring bases and associated parking will be porous amenity grass reinforced by natural gravel, any accidental spillages will migrate into the grass and gravel. During severe storm events, surface runoff will discharge as sheet flow into the next terrace downstream where it will be intercepted by the filter drain and then be conveyed to the main filter drain along the road edge. As a further means of pollutant control, we can include a Downstream Defender if deemed necessary. This is a device which filters out pollutants and is contained in a standard manhole

1.5 I agree with the LLFA consultation response that water quality information must be provided (using the Ciria SuDS simple index approach),

Response – The following Simple Index Approach has been used to assess water quality.

The Simple Index Approach is used to assess water quality of the site below, in accordance with the guidance in CIRIA SuDS Manual. Tables 26.2 and 26.3 of the SuDS Manual indicate that the site, which will be used for the siting of touring caravans, motorhomes and tents including a small amenity block and the terracing of the site to accommodate roads, parking and pitches is considered to be within the second category of land use as defined in Table 26.2 below.

TABLE 26.2 Pollution hazard indices for different land use classifications

Land use	Pollution hazard level	Total suspended solids (TSS)	Metals	Hydrocarbons
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

Therefore, the pollution hazard indices for the site are as follows:

Total suspended solids (TSS) = 0.5

Metals = 0.4

Hydrocarbons = 0.4

TABLE 26.3 Indicative SuDS mitigation indices for discharges to surface waters

Type of SuDS component	Mitigation indices ¹		
	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 ³	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 drainage area.		

The proposed use of both filter drains and porous pavements are selected as SuDS components for the site. Based on Table 26.3, the total SuDS mitigation index for each component is calculated using the following formula:

$$\text{Total SuDS mitigation index} = \text{mitigation index}_1 + 0.5 (\text{mitigation index}_2)$$

Where: mitigation index $_n$ = mitigation index for component n

Therefore, the total SuDS mitigation index for each component are:

$$\text{Total suspended solid (TSS)} = (\text{Filter Drain} + \text{Porous Pavements}) = 0.4 + (0.5) 0.7 = 0.75$$

$$\text{Metals} = (\text{Filter Drain} + \text{Porous Pavements}) = 0.4 + (0.5) 0.7 = 0.75$$

$$\text{Hydrocarbons} = (\text{Filter Drain} + \text{Porous Pavements}) = 0.4 + (0.5) 0.7 = 0.75$$

There is no infiltration from the SuDS to groundwater, therefore, the groundwater indices are not considered.

The comparison of the Total SuDS mitigation indices and the pollution hazard indices are shown in the following Table 1:

Component	Total SuDS Mitigation index	Pollution Hazard index	Does the total SuDS mitigation index equal or exceed the pollution hazard index?
Total suspended solid (TSS)	0.75	0.5	Yes
Metals	0.75	0.4	Yes
Hydrocarbons	0.75	0.4	Yes

Table 1: Comparison of the Total SuDS mitigation indices and the pollution hazard indices.

For each contaminant type, the total SuDS mitigation index exceeds the pollution hazard of the same contaminant type. Therefore, the proposed SuDS components will deliver adequate treatment of surface water prior to discharging to the ordinary watercourse. However, in addition and if deemed necessary, following consultation on the discharge of conditions, a final “Downstream Defender” can be installed as a further measure of protection at the outfall.

1.6 Exceedance flow routes must be shown on a plan

Response – Please refer to Dwg Dwg2000.0016_110_P1 – Exceedance Flow Routes.

1.7 SuDS maintenance information is required for the proposed surface water drainage strategy.

Response – The following Drainage Maintenance measures and schedules are proposed for each of the drainage components:

Drainage Maintenance

- 1.7.1 The proposed filter drains, attenuation crates, and flow control device would be the responsibility of, and maintained by the site owner to ensure their effectiveness over the lifetime of the development.

- 1.7.2 The private drainage systems on site will be managed by the site owner or appointed management company to ensure the capacity and functionality of all the drainage components is maintained during the lifetime of its use.
- 1.7.3 Access for inspection and maintenance of the SuDS features should be made available at all times, this would include adequate access for appropriate equipment and vehicles.
- 1.7.4 The following Table 32.1 from the Ciria SuDS Manual provides the recommended regular, occasional, and remedial operation and maintenance activities for each of the SuDS elements.

TABLE 32.1 Typical key SuDS components operation and maintenance activities (for full specifications, see Chapters 11–23)

Operation and maintenance activity	SuDS component												
	Pond	Wetland	Detention basin	Infiltration basin	Soakaway	Infiltration trench	Filter drain	Modular storage	Pervious pavement	Swale/bioretention/ trees	Filter strip	Green roofs	Proprietary treatment systems
Regular maintenance													
Inspection	■	■	■	■	■	■	■	■	■	■	■	■	■
Litter and debris removal	■	■	■	■	□	■	■	□	■	■	■		□
Grass cutting	■	■	■	■	□	■	■	□	□	■	■		
Weed and invasive plant control	□	□	□	□		□	□		□		□	■	
Shrub management (including pruning)	□	□	□	□					□	□	□		
Shoreline vegetation management	■	■	□										
Aquatic vegetation management	■	■	□										
Occasional maintenance													
Sediment management¹	■	■	■	■	■	■	■	■	■	■	■		■
Vegetation replacement	□	□	□	□						□	□	■	
Vacuum sweeping and brushing									■				
Remedial maintenance													
Structure rehabilitation /repair	□	□	□	□	□	□	□	□	□	□	□	□	
Infiltration surface reconditioning				□	□	□	□		□	□	□		

Key

■ will be required

□ may be required

Notes

¹ Sediment should be collected and managed in pre-treatment systems, upstream of the main device.

1.8 What is the proposed path of this drainage after it leaves the site?

Response – This drainage will discharge into the existing ordinary watercourse which follows the northern site boundary .

1.9 An existing watercourse is shown along the north-eastern boundary of the site in drawing 2000.0016. If this is not correct, as implied in the drainage statement, then a correct plan must be submitted with the current conditions.

Response – This is the correct watercourse. This existing water course has been partly culverted off site and outside the application site boundary by the adjoining landowner. We do not have details of the off-site downstream drainage arrangements, and these are not the responsibility of t applicant. Any Consent to Discharge into this watercourse will be obtained from the LLFA if permission is granted and this can be a condition of planning permission.