



STRUCTURAL ENGINEERS

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Our Ref: L-1886/S/002

16th April 2019

ABDS Ltd
Boscarnon Farmhouse,
St Keverne,
Cornwall,
TR12 6NU

Dear Mr Brown,

Re: Land of Withington Street, Sutton Bridge, Lincolnshire

Following comments received from the LLFA regarding the outline planning application for 70 dwellings at land north of Withington Street, Sutton Bridge we respond as follows;

We note below an extract from section 7.7 Soakaways taken from the AGS Ground Solutions Ltd Geo-Environmental Report A1816-2;

"Given the clayey soil, the potentially high groundwater table and the poor infiltration rates, it is unlikely that conventional soakaways will be a practical solution for the disposal of stormwater on the site."

We have separately reviewed their findings and concur with their assessment.

The use of the permeable paving and an online detention basin is considered a suitable form of SUDS and in line with the SUDS manual. Water is treated and controlled on site (at source) prior to outfall into the existing Anglian Water Sewer. The use of an online detention basin not only deals with attenuation above ground, rather than in below ground tanks but it also offers good water quality treatment.

With reference to chapter 26 (water quality management), table 26.2, extract overleaf, the following pollution indices have been determined;

- Residential roofs - TSS 0.2, Metals 0.2, Hydrocarbons 0.05
- Driveways – TSS 0.3, Metals 0.2, Hydrocarbons 0.05
- Low traffic road – TSS 0.3, Metals 0.2, Hydrocarbons 0.05

To mitigate against these pollutants the scheme will provide tanked permeable paving to all private drives and an online detention basin with a micro pool at the outfall, all as stated in the FRA. In accordance with table 26.3 of the SUDS manual, extract overleaf, the following mitigation indices can be applied;

- Permeable paving - TSS 0.7, Metals 0.6, Hydrocarbons 0.7
- Detention Basin – TSS 0.5, Metals 0.5, Hydrocarbons 0.6

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TABLE 26.2 Pollution hazard indices for different land use classifications

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

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.		

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As can be seen from the above, pollutants associated with this development will be adequately dealt with by the use of tanked permeable paving and an on line detention basin. The use of a micropool at the outfall of the basin will also add further treatment of pollutants.

We have followed the Lincolnshire Development Roads and Sustainable Drainage Design Approach November 2017 Edition;

“Wherever possible, drainage systems should be designed to capture and re-use surface water to help reduce run-off volumes from the site and allow water, as a valuable resource, to be put to good use (e.g. irrigating landscapes, watering gardens, car washing and toilet flushing etc). In some instances when suitable water treatment is undertaken, surface water can be used for human and animal consumption. However; where re-use is not feasible (or is only part of the highway sustainable drainage solution); the NPPF Planning Practice Guidance indicates that generally, the aim should be to discharge surface run off as high up the following hierarchy of drainage options as reasonably practicable:

- 1. Into the ground (i.e. infiltration but does not infer the use of soakaways!);*
- 2. To a surface water body;*
- 3. To a surface water sewer, highway drain, or another drainage system; or*
- 4. To a combined sewer.*

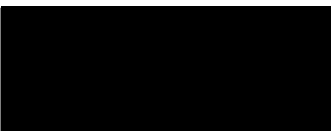
Particular types of sustainable drainage systems may not be practicable in all locations therefore Developers should not assume that infiltration is always the solution as experience has shown that over 50% of developments require a positive outfall.”

The system employed captures the water on site, pollutants are contained in tanked permeable paving and treated via a micropool at the outfall of the basin. The on-site system ultimately discharges into an adopted asset, which after a relatively short distance outfall into an IDB channel.

We consider the design principles adopted fully comply with the Lincolnshire Drainage Design Approach and that the use of SUDS on this development to be suitable and in line with the Ministerial Statement of December 2014.

We trust the above is as expected and self-explanatory, however, should you have any queries then please do not hesitate to contact us.

Yours sincerely,



A.J. Webb BEng (Hons), C.Eng, M.I.StructE
for and on behalf SEA Structural Engineers Limited