


KCS Agricultural Ltd
North Park Rheda,
Phase 2.
Operation & Maintenance Plan for Sustainable
Drainage Systems



Civil Engineers
Structural Engineers
Project Managers

Document No: AA7281/8.4/OMP Rev A

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Issue	Name	Signature	Date
Revision A	William Milne		30 th August 2024
Purpose of Issue	Planning Application		

30th August 2024

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Introduction

1.1 Asher Associates Ltd have been appointed by KCS Agricultural Ltd to provide an Operation and Maintenance plan for sustainable drainage systems for a proposed residential development at North Park Rheda. In reviewing the enclosed information, reference should be made to the latest revisions of the following Asher Associates drawings:

- AA7281/EW/03
- AA7281/EW/04
- AA7281/EW/05
- AA7281/EW/06
- AA7281/EW/07
- AA7281/EW/08
- AA7281/EW/10

1.2 SUDS COMPONENTS

This residential development utilises a series of SuDS features across the site to serve driveways / individual parking areas, roofs and access roads. These features include underground storage with infiltration and infiltration trenches as part of the overall surface water drainage strategy for the site. The SuDS features have been designed to provide sufficient storage for the critical duration, 1 in 100-year design storm event with a 50% allowance for the future effects of climate change, a 10% allowance for urban creep. Adoptable Roads in the development discharge to distinct infiltration features which also provide storage and have overflows in the event of failure to be into the wider private network.

The SUDS features shall remain private and shall be maintained by a third-party Management Company, appointed by KCS Agricultural Ltd.

All below ground pipework under adoptable surfaces, will be offered for adoption under a S104 agreement with UU or a NAV. Pipework shall be adopted up to the infiltration features inlets, including the interconnecting pipework and flow controls. All diverted land drainage shall remain private and shall be maintained by a third-party management company.

Operation & Maintenance Requirements

As with all traditional drainage systems, SuDS need to be inspected and maintained regularly to ensure that they operate correctly and efficiently. If SuDS are not properly maintained, then there is a risk that the components become overloaded during periods of prolonged heavy rainfall potentially resulting in localised flooding within the development.

Recommendations for the maintenance of the SuDS components are detailed in the following section.

As part of this process, it is recommended that inspection and maintenance records are retained by the Management Company to track the progressive performance of the SuDS over time. The inspection records should include the following:

- Sediment condition and depth
- Water observations (sheen, smell, etc.)
- Unscheduled maintenance needs
- Components that do not meet performance criteria and require immediate maintenance
- Common problem areas, solutions and general observations
- Aesthetic conditions

For Health and Safety reasons as well as practicality, SuDS systems should be maintained during periods of dry weather wherever possible. Adhering to the recommended maintenance regimes outlined below will minimise the risk of maintenance activities being required when a fault becomes apparent, usually during a rainfall event.

Underground SuDS features are to be preceded by catchpits to protect the features from silting.

2.1 Infiltration Systems: Underground Storage with Infiltration & Infiltration Trenches

Underground storage with infiltration is an excavation that is filled with a void-forming material that allows the temporary storage of water before it soaks into the ground.

Historically, small storage systems draining runoff from a single property were either filled with rubble or lined with brickwork and were sited below gardens and drives with no formal provision for access and inspection. Many small systems are now constructed with

geocellular units available from builders' merchants pre-wrapped in geotextile. The geocellular units provide good overall storage capacity compared to rubble fill, and they allow the size of the structure required for any application to be minimised.

Infiltration Trenches are simply linear underground storage with infiltration systems. The advantages of trenches over cuboid systems is that they can often be kept shallower and, in variable soils, can help distribute the infiltration area so that the impact of less permeable areas of soil is less pronounced. A perforated pipe can be included, if required, to distribute water along the trench.

Infiltration systems will require regular maintenance to ensure continuing operation to design performance standards. An easement should be considered where multiple properties discharge to a single underground storage and infiltration system, to ensure long-term access for maintenance purposes.

The design of infiltration systems should include monitoring points where the water level in the system can be observed or measured. This can either be via an inspection well or inspection cover (where the attenuation storage space is a void). For larger installations the inspection access should provide a clear view of the infiltration surface (even if the storage zone is filled). For small, filled underground storage, a 50mm perforated pipe is adequate.

At the proposed development, the infiltration systems shall be maintained by a third-party Management Company, appointed by KCS Agricultural Ltd.

The maintenance activities are outlined in Table 2.1 and refer to the recommendations in The SuDS Manual (CIRIA C753), Chapter 13, Table 13.1 ^[1].

Table 2.1 Operation and Maintenance requirements for underground storage with infiltration

Maintenance Schedule	Required Action	Typical Frequency
Regular Maintenance	Inspect for sediment and debris in pre-treatment components and floor of inspection tube or chamber and inside of concrete manhole rings	Annually
	Cleaning of gutters and any filters on downpipes	Annually (or as required based on inspections)
	Trimming any roots that may be causing blockages	Annually (or as required)
Occasional Maintenance	Remove sediment and debris from pre-treatment components and floor of inspection tube or chamber and inside of concrete manhole rings	As required, based on inspections
Remedial Actions	Reconstruct storage system and/or replace or clean void fill, if performance deteriorates or failure occurs	As required
	Replacement of clogged geotextile (will require reconstruction of storage system)	As required
Monitoring	Inspect silt traps and note rate of sediment accumulation	Monthly in the first year and then annually
	Check storage system to ensure emptying is occurring	Annually

Maintenance will usually be carried out manually, although a suction tanker can be used for sediment/debris removal for large systems. If maintenance is not undertaken for long periods, deposits can become hard-packed and require considerable effort to remove.

Replacement of the aggregate or geocellular units will be necessary if the system becomes blocked with silt. Effective monitoring will give information on changes in infiltration rate and provide a warning of potential failure in the long term.

Roads and/or parking areas draining to infiltration components should be regularly swept to prevent silt being washed off the surface. This will minimise the need for maintenance.

References

- [1] CIRIA, The SuDS Manual, Report C753, 2015.