

TECHNICAL NOTE

SuDS Maintenance Manual

Dappers Lane, Angmering

1.0 Introduction

- 1.1 Lanmor Consulting Ltd has been appointed by Countyoak Homes Ltd to prepare a site-specific SuDS Maintenance Manual for the proposed development at Dappers Lane, Angmering, West Sussex, BN16 4EN. The development proposals include for the construction of 6 new residential dwellings with the existing house to be retained. A new access road is to be constructed along with a new parking area for the existing house.
- 1.2 This Maintenance Manual supersedes Section 5 of the Drainage Calculations report, reference 191183/DC/JR/RS/01, in order to discharge Conditions 11 & 13 of planning ref A/178/17/OUT. This manual only covers the surface water drainage network and SuDS elements. For the foul drainage and package treatment plant please refer to the manufacture's guidance.

2.0 Surface Water Drainage Overview

- 2.1 All surface water runoff from the site is discharged to ground. This is achieved through the use of permeable paving for runoff from the houses, a filter drain for runoff from the impermeable areas of road and permeable paving for the remainder.
- 2.2 Runoff from the rear rainwater pipes (RWP) on the houses is discharged into the sub-base of the patio via a diffuser unit where it then drains into the ground. A catchpit at the base of the RWP collects silt from the runoff and provides access for maintenance. The RWPs to the front of the houses drain into the sub-base of the driveway, which has been constructed as a permeable pavement. Again, diffusers are used and catchpits provided.
- 2.3 The access road is partly constructed from impermeable asphalt concrete. The runoff from this section is collected by a channel gully along the southern side. This has a series of outlet pipes which drop directly into the filter drain below. From here the water drains into the surrounding ground. The remainder of the road will use permeable paving to discharge directly to ground.

- 2.4 For full details of the below ground surface water drainage network and SuDS features please refer to the Lanmor Consulting Ltd construction drawings, 500 series.

3.0 General Maintenance

- 3.1 Regularly inspecting the surface water drainage network for blockages and clearing unwanted debris / silt from the system should improve the performance of the surface water network and decrease the need for future repairs. In the event that road gullies become blocked, high pressure water jets can be used to clear the gully and ensure they are functioning correctly.
- 3.2 The level and frequency of maintenance required on site is dependent on the type of facility. The type of maintenance will fall into one of three categories “regular maintenance”, “occasional maintenance” and “remedial maintenance”. Regular maintenance of the drainage and SuDS features will include, inspections, removal of litter / debris and sweeping of the surfaces. Occasional maintenance will include removal of sediment etc. and remedial maintenance may include structural repairs and infiltration reconditioning if required.
- 3.3 On completion of the development, an initial inspection of the drainage and SuDS elements will be undertaken to ensure they are functioning correctly and have not been affected by the construction activities, such as blockages caused by construction materials. For the six months following occupation inspections will take place on a quarterly basis, and after any large storms, thereafter it should be annually as per schedule below and adjusted as necessary if the initial monitoring period has identified any issues.

4.0 Permeable Paving (Driveways and first section of Access Road)

- 4.1 The driveways on each property are designed as a permeable paving with the rainfall draining directly through into the ground below. The driveways also discharge runoff from the front RWPs into the ground. The first section of the access road will also be constructed in permeable paving which will allow runoff to discharge directly to ground. The following maintenance regime for these areas will be implemented.

Permeable Paving Maintenance Schedule (Driveways and Access Road)		
	Required Action	Typical Frequency
Regular maintenance	Brushing and vacuuming (standard cosmetic sweep over whole surface)	Once a year, after autumn leaf fall, or reduced frequency as required, based on site-specific observations of clogging or manufacturer's recommendations – pay particular attention to areas adjacent to landscaped areas where water runs onto pervious surfaces as this an area most likely to collect the most sediment.
Occasional maintenance	Stabilise and mow contributing and adjacent area around driveways etc	As required
	Removal of weeds or management using glyphosate applied directly into the weeds by an applicator rather than spraying	As required- once per year on less frequently used pavements
Remedial Actions	Remediate any landscaping which, through vegetation maintenance or soil slip, has been raised to within 50 mm of the level of the paving	As required
	Remedial work to any depressions, rutting and cracking of the surface course considered detrimental to the structural performance or a hazard to users	As required
	Rehabilitation of surface and upper substructure by remedial sweeping	Every 10 to 15 years or as required (if infiltration performance is reduced due to significant clogging)
Monitoring	Inspect for evidence of poor operation and/or weed growth - if required, take remedial action.	Six-monthly, 48 hours after large storms in the first year, thereafter annually
	Inspect silt accumulation rates and establish appropriate brushing frequencies	Annually
	Monitor inspection chambers	Annually

5.0 Filter Drain (Adjacent to impermeable Access Road)

5.1 The access road, where constructed using an impermeable surface, is positively drained via a channel gully along the southern edge. Water is discharged from the channel gully via a series of vertical pipes directly into the filter drain below. The filter drain has a perforated pipe passing along the base to help water infiltrate evenly and to provide access for maintenance. There is an access manhole at either end of the structure for rodding/jetting purposes. The following maintenance regime will be implemented.

Filter Drain Maintenance Schedule		
	Required Action	Typical Frequency
Regular maintenance	Remove litter and debris from channel, filter drain surface, access chambers and pre-treatment devices.	Quarterly
	Inspect channel, filter drain surface, inlet/outlet pipework and control systems for blockages, clogging, standing water and structural damage.	Quarterly
	Inspect pre-treatment systems, inlets and perforated pipework for silt accumulation, and establish appropriate silt removal frequencies.	Six Monthly
	Remove Sediment from pre-treatment devices in ACO channel	As required
Occasional maintenance	Remove or control tree roots where they are encroaching the sides of the filter drain, using recommended methods.	As required
	At locations with high pollution loads where oils may be carried across impermeable surfaces to the drain, remove and wash or replace overlying filter medium.	Five yearly, or as required
	Clear perforated pipework of blockages.	Annually

6.0 Replacement at end of Design Life

- 6.1 Both the permeable paving and the filter drain use a granular material to store the runoff while allowing it to drain into the ground below. For the driveways, part of the filter drain and permeable section of access road this is then covered by the road construction. As part of the ongoing maintenance this material will be inspected to determine if it is still functioning as intended. At the end of the manufactures recommended design life the material will be assessed to determine if it needs replacing.
- 6.2 When it does need replacing, for the driveways and permeable road this will mean the full reconstruction of the pavement. The design life of the pavement surface is expected to exceed this timescale to replace the granular subbase. Therefore, the remedial works will involve providing a completely new pavement structure restoring the permeability and the aesthetics.
- 6.3 For the filter drain that is adjacent to the turning head, the gravel material can simply be excavated and replaced. Care will need to be taken not to damage the access manholes or surrounding structures, and the permeable pipe should be relayed at the same level.
- 6.4 For the filter drain under the access road this will require a trench slot to be excavated through the pavement construction which will need to be reinstated following the renewal of the gravel material as per the above.

7.0 Maintenance of Ditch and Culvert

- 7.1 There is an existing watercourse passing along the boundary between the site and Dappers Lane which has been culverted under the existing access into the site. The following maintenance regime will be implemented for the ditch and culvert.

Ditch Maintenance Schedule (Ditch and Culvert)		
	Required Action	Typical Frequency
Regular maintenance	Remove litter and debris	Monthly, or as required
	Cut grass – to retain grass height within specified design range	Monthly (during growing season), or as required
	Manage other vegetation and remove nuisance plants	Monthly at start, then as required
	Inspect inlets for blockages, and clear if required	Monthly
	Inspect vegetation coverage	Monthly for 6 months, quarterly for 2 years, then half yearly
	Inspect inlets and facility surface for silt accumulation, establish appropriate silt removal frequencies	Half yearly
Occasional maintenance	Reseed areas of poor vegetation growth, alter plant types to better suit conditions if required	As required

- 7.2 The ditch and the culvert will be in the ownership of the Management Company and it will be their responsibility to ensure it is maintained in accordance with this manual refer to Maintenance responsibilities and arrangements above
- 7.3 The route and depth of the piped culvert was confirmed by CCTV. Following construction another survey should be completed to ensure the pipe is clear of any debris that might have entered during the construction phase.
- 7.4 Following completion, a visual inspection of the pipe and the area around it will be undertaken annually, or as required. In addition, every 10 years a detailed inspection of the pipe via a CCTV camera will be completed to determine if any remedial works are required.

8.0 Maintenance Responsibilities and Arrangements

- 8.1 It is proposed that the responsibility of the on-going sustainable underground drainage system maintenance is the responsibility of the formal Management Company.
- 8.2 Prior to the Management Company taking responsibility for the SuDS maintenance, it will be the responsibility of Countyoak Homes Ltd (the developer), to ensure the system is properly maintained in accordance with guidelines set out in this manual.
- 8.3 The Management Company will be legally put in place by the developer, with a legal responsibility to ensure the on-going and future maintenance of the system. On completion of the development, the communal land will be transferred, at no cost, to the Management Company. The maintenance responsibility will include both the communal land and the areas of land requiring maintenance owned individually by the property owners.
- 8.4 It will be a condition of sale and therefore a legal responsibility that the owners of the individual properties become one sixth shareholders and directors of the Management Company. Each property/owner will own 1/6th each of the Management Company. Once all six properties are sold, they will be the only owners/directors. Accordingly, there will be a legal responsibility to ensure the maintenance of the system. It will be a further condition of sale, that should the Management Company or subsequent Management Company be no longer able to fulfil its maintenance duties, the responsibility will fall back on the individual property owners. It will also be the responsibility of the Management Company to ensure that sufficient funds are set aside in a sinking fund to cover the cost of any future replacement or upgrading of the system.
- 8.5 Until such time as the Management Company is formalised and handed over, it will remain the responsibility of the developer to maintain the system.
- 8.6 Prior to the handover of the Management Company, the developer will appoint a contractor to carryout regular maintenance of the system, in accordance with the regime set out in this maintenance manual. The maintenance contract will include the on-going maintenance of the culvert and ditch abutting the site. It will be the responsibility of the Management Company to maintain this contract or to ensure an alternative suitable arrangement is put in place.
- 8.7 The costs associated with the Management Company undertaking these works will be an obligation of the property owners, who will be required to pay a monthly contribution towards this and other communal costs. The level of each contribution will be set by the developer, forming part of the individual contract of sale. Should the Management Company be set-up and

handed over by the developer prior to the last property sale, the developer will be responsible for the share of the unsold properties.

- 8.8 Whilst the shareholders and directors will be able to formally instruct a third-party Management Company to fulfil their management responsibilities, should this company become unable to fulfil the duties, the obligation will automatically revert back to the property owners or new Management Company.