



Land North of The Rise, Littleworth Lane,
Partridge Green

Drainage Management & Maintenance Plan

For

Macar Homes

Document Control Sheet

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This document has been issued and amended as follows:

Date	Issue	Prepared by	Approved by
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1.0 Introduction

- 1.1 This document sets out the principles for the long-term management and maintenance of the proposed surface water drainage system at the Land North of The Rise development.
- 1.2 The purpose of this document is to ensure that the site management company or their agents have a robust inspection and maintenance plan going forwards. This ensures the optimum operation of the surface water drainage system and that it will be continually maintained for the lifetime of the development. This will contribute to reducing the risk of surface water flooding both on- and off-site.
- 1.3 All those responsible for maintenance should follow relevant health and safety legislation for all activities listed within this report (including lone working, if relevant). Method statements and risk assessments should always be undertaken and made available, if requested.
- 1.4 This document has been produced by Motion on behalf of their client, Macar Homes. This document describes the typical management and maintenance tasks that are known at the outline design stage (maintenance frequencies and typical tasks, for example). These have been drawn from industry guidance such as CIRIA C753 - The SuDS Manual – and manufacturer's own guidance.
- 1.5 Maintenance is considered as a construction activity under the CDM Regulations 2015. Under the CDM Regulations, it is a requirement that a competent person be appointed to carry out a required role. CDM defines a competent person as an individual with sufficient knowledge of the specific tasks to be undertaken, as well as sufficient experience and ability to carry out their duties in relation to the task in a way that secures health and safety on site.
- 1.6 In recognition of the requirements of the CDM Regulations 2015, this surface water management and maintenance plan expects that the maintenance work will be carried out by a competent person who must have prior knowledge of the drainage components and SuDS systems on site.
- 1.7 There are limitations on what this document can prescribe at this time. At this stage this document cannot name the specific individuals who will carry out the maintenance and what equipment is to be used. Related to this, this document is unable to provide method statements for exactly how maintenance practices will be carried out. These can only be determined at the time of the maintenance being carried out and the exact maintenance need. Therefore, this is to be the responsibility of the site management company and/or the individuals carrying out the work. We urge those who are carrying out the maintenance to record this information and make it available to the Local Planning Authority (LPA), if required to do so. This drainage management and maintenance plan needs to be a living document that is owned and maintained by the adopting site management company. The intention of the report is to set out the principles for the long-term management and maintenance of the proposed surface water drainage system at the development.

2.0 Maintenance Categories

2.1 There are three categories of maintenance activities referred to in this report. These are:

Regular maintenance (including inspections and monitoring)

- ▶ Regular maintenance consists of basic tasks done on a frequent and predictable schedule, including inspections, vegetation management, and litter, silt and debris removal.

Occasional maintenance

- ▶ Occasional maintenance comprises tasks that are likely to be required periodically, but on a much less frequent and predictable basis than the routine tasks (sediment removal is an example).

Remedial maintenance

- ▶ Remedial maintenance comprises of intermittent tasks that may be required to rectify faults associated with the system. The likelihood of faults can be minimised by correct installation, regular inspection and timely maintenance. Where remedial work is found to be necessary, it is likely to be due to site-specific characteristics or unforeseen events and, as such, timings are difficult to predict.
- ▶ This document should be read in conjunction with the design drawings of the drainage system, so that the location and type of each feature can be recognised and understood.

3.0 The Surface Water Drainage System

3.1 The proposed surface water drainage system is made up of a number of components. These include:

- ▶ Pervious Pavements
- ▶ Detention Basins
- ▶ Catchpit Manholes/Silt Traps/Linear Drainage Channel Sump Units/Gullies
- ▶ Hydro-Brake Flow Control
- ▶ Manholes
- ▶ Pipes/Linear Drainage Channels
- ▶ Existing ditch running along the northern Boundary of the Site.

3.2 All components should be installed in accordance with the manufacturer's instructions and to the levels/arrangement as defined on the designer's drawings. Not doing so will invalidate any warranty provided by the manufacturer.

3.3 All maintenance and cleaning must be carried out in accordance with manufacturer's recommendations and by competent and suitably qualified staff, as defined in the CDM regulations 2015.

3.4 With regards to details of which body will be responsible for managing the maintenance for individual aspects of the drainage proposals over the lifetime of the development, appropriate and regular maintenance of all the drainage infrastructure will be undertaken by the operator of the Land North of The Rise development which is Macar Homes.

4.0 General Maintenance Principles

- 4.1 All surface water drainage systems, whether piped gravity systems, Sustainable Drainage Systems (SuDS), or flow control devices and pumps, require regular maintenance to keep them working at optimum efficiency and capacity. The maintenance of the surface water drainage system on the development should be carried out alongside other regular maintenance tasks on site.
- 4.2 Timely and adequate maintenance will increase the lifespan of all the drainage components. Inadequate maintenance will do the reverse. Therefore, the projected lifespan and anticipated replacement date of each drainage component cannot be forecast at the time of this document being produced.
- 4.3 The site management company and/or their agents are responsible for the maintenance of the surface water drainage system.
- 4.4 Construction activities can create and discharge significant quantities of sediment that will quickly clog the surface water drainage system. Therefore, construction-stage sediment removal is required immediately post-construction. This may require several cleans of the system during the first year after installation. The construction site manager should assess this and carry out cleaning as necessary.
- 4.5 Catchpit manholes/silt traps will be specified upstream of the SuDS. They will remove gross solids and the majority of silts. It is important that any debris build-up in the catchpit manholes/silt traps is removed at regular intervals. This will reduce the risk of the pervious pavements becoming silted up. It will maintain its design capacity and function.
- 4.6 Cleaning should also take place after large storms when there have been increased surface water flows and visible entrainment and deposition of debris.
- 4.7 An increased frequency of inspection and maintenance should be programmed into the autumn and winter months in acknowledgement that:
 - ▶ Leaf fall from deciduous trees in autumn will result in an increased amount of leaf litter and an elevated blockage risk of drainage infrastructure.
 - ▶ Increased rainfall during winter months will result in greater quantities of water moving through the drainage system and a greater input of silt and other debris.
- 4.8 Table 4.1, below, gives an overview of typical maintenance tasks and the frequency with which they need to be undertaken. Section 5 – Inspection and Maintenance Frequency of Components – will assign typical maintenance frequencies and tasks to the specific components used within the surface water drainage system used on the development.

Table 4.1: Typical maintenance tasks and frequencies

Activity	Indicative Frequency	Typical Tasks
Routine/regular maintenance	Monthly to annually	▶ Litter picking ▶ Silt removal ▶ Inspection of all inlets, outlets and control structures ▶ Weed removal and invasive plant control
Occasional maintenance	Annually up to 25 years	▶ Silt control around components ▶ Vegetation management around components ▶ Sweeping of pavement areas to remove surface silt ▶ Silt removal from catchpits, cellular storage structures
Remedial maintenance	As required	▶ Inlet/outlet repairs ▶ Erosion repairs ▶ Reinstatement of edgings ▶ Reinstatement following pollution ▶ Removal of silt build-up and leaf litter after storms ▶ Repair of vandalism ▶ Replacement of any blocked filter membranes/materials

5.0 Inspection and Maintenance Frequency of Components

- 5.1 Table 5.1 below lists each of the components used within the site's surface water drainage system. It suggests an indicative maintenance frequency for each component and ascribes typical maintenance tasks to them.
- 5.2 This list is not exhaustive, nor is it prescriptive. As mentioned in Section 3, additional, unscheduled maintenance may be required following adverse weather conditions or after autumn leaf falls. Additional maintenance tasks may be required to adequately clean and maintain individual components.
- 5.3 The list of components should be cross-referenced with the designer's drawings so that the location of each component can be identified.
- 5.4 It is the responsibility of the site management company and/or their agents to ensure that all necessary maintenance activities are carried out in a timely manner and that the design performance of each drainage component is preserved.
- 5.5 If there is any uncertainty regarding the correct and safe methods of cleaning, or what equipment should be used, the manufacturer should be consulted.
- 5.6 Upon completion of maintenance activities, a record should be kept of the work carried out. This should be retained and an annual maintenance report should be compiled, which should include the following:
- ▶ Observations resulting from inspections
 - ▶ Maintenance and operation activities undertaken during the year
 - ▶ Recommendations for inspections and maintenance programmes for the following year
- 5.7 On the last page is a table with suggested information should be recorded and included with the maintenance plan. As mentioned in the introduction to this document, this should be a living document and regularly updated, as required.
- 5.8 The Local Planning Authority Horsham District Council (HDC) may request to check and sign off any maintenance activities. Therefore, it is recommended that the LPA is contacted prior to any scheduled routine maintenance. Also, with reference to Table 5.1, the annual maintenance report, including a completed version of the table on the last page, should be offered to the LPA for their records and approval.

Table 5.1: Maintenance Frequency and Task for Drainage Components

Activity	Indicative Frequency	Anticipated Tasks
Pipes/Linear Drainage Channels	As required. It is recommended that the rate of sediment accumulation is inspected monthly and after storm events to establish the appropriate frequency of sediment removal.	▶ Identify any pipes/channels that may not be operating properly and employ a competent, qualified contractor to inspect using CCTV. ▶ If the pipe/channel is blocked with silt or debris, the pipe/channel should be jetted clean from an upstream access point. All silt and debris should be captured and removed at a downstream access point. ▶ Clear perforated pipework of blockages ▶ Inspect once clean. ▶ If any other defects are encountered (cracks, displaced joints), appropriate solutions should be discussed with a competent and qualified contractor. These services are usually provided

		by the same companies that offer CCTV surveys and pipe jetting services.
Manholes	Annually	▶ Inspect/identify any damage or areas that are not operating correctly ▶ Remove silt, litter, leaves and other detritus. ▶ Inspect once clean.
Catchpit Manholes/Silt Traps/Linear Drainage Channel Sump Units/Gullies	As required. It is recommended that the rate of sediment accumulation is inspected monthly and after storm events to establish the appropriate frequency of sediment removal.	▶ Inspect/identify any damage or areas that are not operating correctly ▶ Remove silt, litter, leaves and other detritus. ▶ Inspect once clean.
Detention Basins	Monthly in Summer, as required in Winter	▶ Responsibility should be with landscape contractors. ▶ Maintenance tasks are not that different from standard public open space. ▶ Adequate access needs to be provided to the area. ▶ Regular mowing should take place across maintenance access routes, amenity areas, across embankments and the main storage area. Remaining areas can remain as 'meadow'. Mowed grass lengths of 75 – 100mm are appropriate. ▶ Grass clippings should be disposed of off-site. ▶ Any dead growth should be cleared before the start of the growing season. ▶ Any permanently wet areas with emergent aquatic vegetation should be managed as ponds or wetlands. ▶ Remove any sediment build-up as required. ▶ Check any inlets and outlets for blockages and clear as required. ▶ Check any flow control devices, if present.
Hydro-Brake Flow Control chamber	As required	▶ Contact manufacturer for instruction on approved and safe inspection and maintenance practices. ▶ Inspect Hydro-Brake/Orifice Flow Control and check functionality. Remove any detritus as required. ▶ Inspect once clean.
Pervious pavements	Once a year after autumn leaf fall, or reduced frequency as required, based on site-specific observations of clogging or manufacturer's recommendations.	▶ Remove litter including leaf litter and debris from surface and agitate surface to ensure no vegetation or moss is allowed to establish and grow. ▶ Locally refill with the correct aggregate once a year or as appropriate ▶ Remove weeds from the surface through the application of glyphosate-based weed killers ▶ Stabilise and mow contributing and adjacent areas. ▶ Inspect once clean.

		▶ See Table 20.15 of CIRIA C753 for more information. ▶ Major oil spills have the potential to contaminate the surface and the underlying crushed stone. In the event of a major oil spill, the area of crushed stone that is affected should be removed, cleaned and reinstalled.
Existing ditch running along the northern Boundary of the Site	• Ensure that you undertake the majority of your clearance works after the vegetation has begun to die back in late September/October. At this time of year, there is also less likely to be wildlife nesting or breeding in or near ditches. • You should try and carry out the works when the water level is at its lowest i.e. following low tide in tide locked areas or when there has been little rainfall. • Plan your maintenance to ensure that stretches of habitat are left intact, for example by trimming alternate banks or lengths of ditch each year. This ensures that there is always a healthy vegetated area where wildlife disturbed by maintenance can move to without being forced to leave the ditches. • If protected species have been recorded in your ditches you must ensure their habitats are not adversely affected. • Trash / weed screens and grilles should regularly be checked all year round, but, especially at times of anticipated high flow. • Debris in ditches should be removed as soon as it starts to build up. • In culverted watercourses, your program should inspect the culvert for blockages or signs of collapse. If such problems are identified before a total obstruction to the watercourse occurs, it reduces the likelihood of flooding incidents. Many drainage companies will undertake jet cleaning or camera surveys within culverts at a cost, or you can rod the culverts to check for blockages.	OPEN SECTIONS OF WATERCOURSE ▶ When trimming vegetation it is important to consider any impact on biodiversity. Mowing of banks around ditches should be minimised during the animal spawning season of March to mid-July. ▶ Some trees may have tree protection orders (TPOs) on them so if in doubt check with your local planning authority. ▶ It is recommended to cut only up to just above the water level on one side of the watercourse, leaving the fringe of the bank uncut, thereby maintaining some habitat as well as enabling a free flow of water in the ditch. ▶ Cuttings from any clearance work should be removed from the channel to avoid it causing blockages downstream. Putting removed material too close to the top of the bank can lead to it falling back in during times of flooding. ▶ Remove any physical obstructions such as large rocks, rubble, fallen trees and branches and other waste materials (litter, grass cuttings etc) so that water can flow freely. ▶ All non-organic waste should be completely removed off site and disposed of in an appropriate manner. ▶ Any green waste resulting from the maintenance of ditches can be left a safe distance from the bank for a few days to allow any organisms to move back into the watercourse, after which the green waste should be removed so it doesn't wash back into the watercourse. ▶ Ensure that any disturbed debris does not end up flowing downstream and causing problems for other landowners. ▶ Do not store anything alongside the watercourse which may interfere with maintenance, affect the stability of the bank or get washed into the channel.

		▶ Silt should be removed along the length of the ditch to ensure it flows properly in the right direction. ▶ If there are any pipes into or out of the ditch you should remove silt to the same level or below the bottom of the pipe(s). ▶ Where possible, try to maintain the original slope and cross section of the ditch when de-silting. If the slope of the ditch is altered it can change the flow pattern, cause erosion or increase flood risk either upstream or downstream. ▶ As long as the silt is non-hazardous you can put it on the bank of the watercourse. Depositing silt on top of the banks of the watercourse allows for any organisms to move back into the ditch. However; - o It is essential that this material does not then block any other ditches or nearby roads, or stop water draining into the ditch if it would normally do so (eg from higher ground into the ditch) - o The silt must be deposited as close as possible to where it was dredged from either: on the bank of the waters from where it was taken or on land directly next to the watercourse. ▶ If you think that the material may be hazardous – for instance if it contains oils or other waste – please see guidance online for methods of disposal¹ or contact the Environment Agency for advice. PIPED/CULVERTED SECTIONS OF WATERCOURSE ▶ Blockages within the pipe or at the pipe entrance can cause flooding problems. These blockages can be reduced by regular inspection and the removal of debris. ▶ Either you or a qualified drainage company should carry out regular inspections and clear any blockages or silt build up as soon as they occur. There are many drainage companies that can inspect and clear culverts. ▶ Culvert entrances and exits often have protective grilles to prevent debris entering the pipe and causing blockages. These should be inspected and cleared regularly, especially during the winter or periods of heavy rainfall when debris can accumulate very quickly. ▶ The design of screens must be agreed with the Lead Local Flood Authority or the
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¹ <https://www.gov.uk/guidance/d1-waste-exemption-depositing-waste-from-dredging-inland-waters>

		Environment Agency and permission given prior to installation, as poorly designed screens can cause an obstruction themselves. ▶ Health and Safety must be your top priority when carrying out culvert maintenance, and you should never enter any large culvert without seeking advice. STAYING SAFE Due to the range of risks posed by both open and culverted watercourses, landowners should assess this on a case-by-case basis. In particular you should consider the risks posed by working: ▶ in deep silt or mud. ▶ on slippery banks near water. ▶ in/near deep or fast flowing water. ▶ near roads. ▶ with plant or machinery. ▶ around culverts and enclosed spaces. ▶ cutting down or working near trees. You should always make sure you follow these rules to help protect your health: ▶ Wear protective footwear and clothing such as gloves. ▶ Cover any open wounds such as cuts and scratches with waterproof plasters. ▶ Carefully clean any cuts or scratches obtained during the work near water. ▶ Wash thoroughly and as soon as possible if you have entered the water. ▶ See a doctor if you start to feel unwell after working near water.
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Date	Component requiring maintenance	Issues prompting maintenance	Scheduled maintenance (Y/N)	Maintenance carried out	Additional works required (Y/N). If yes, please detail	Next scheduled date of inspection and maintenance