

Maintenance Schedule

Fleurie Lake Lane, Barnham

For

Fleurie Nursery Ltd

Rev – **P2**

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1 SuDS Maintenance

1.1 Introduction

- 1.1.1 During construction, the Contractor will be responsible for maintaining the drainage and SuDS (Sustainable Drainage Systems). Upon handover, the developer will take on the responsibility of these duties as laid out in this report.
- 1.1.2 Once appointed the Contractor will prepare a site-specific method statement which will include methods for the control of silt and other pollutants during construction. CIRIA Report C5332, Control of water pollution from construction site, provides further guidance on this. This is also further discussed in this statement below.
- 1.1.3 Once the proposed drainage system has been constructed it will be maintained and operated by the contractor until the handing over of the site and subsequently passed on to the Developer /owner.
- 1.1.4 The whole proposed surface water and foul drainage network including access road drainage system will be monitored and maintained (including repairs and replacement) in accordance with the maintenance schedule in perpetuity by Fleurie Nursery Ltd.
- 1.1.5 The maintenance schedule for the proposed development will be split down into two separate categories; SuDS features and regular private drainage.

1.2 SuDS at Land at Fleurie Lake Lane, Barnham.

- 1.2.1 As listed above, in section 5.1.2, the SuDS features used on site will be **Permeable Paving and Attenuation Tank**.
- 1.2.2 The SuDS features have been designed for easy maintenance and comprise:
 - Regular Day-to-Day care – litter collection, regular gardening to control vegetation growth and checking inlets where water enters the SuDS features
 - Occasional tasks – checking the SuDS features and removing any silt that builds up in the SuDS feature
 - Remedial work – repairing damage where necessary

1.3 SuDS Drainage Maintenance Specification

1.3.1 Attenuation Tank

In order to maintain the functioning of the attenuation tanks, the following maintenance requirements should be adhered to:

Table 21.3 Operation and maintenance requirements for attenuation storage tanks		
Maintenance Schedule	Required Action	Typical Frequency
Regular Maintenance	Inspect and identify any areas that are not operating correctly. If required, take remedial action	Monthly for 3 months, then annually
	Remove debris from the catchment surface (where it may cause risks to performance)	Monthly
	For systems where rainfall infiltrates into the tank from above, check surface of filter for blockage by sediment, algae, or other matter; remove and replace surface infiltration medium as necessary.	Annually
	Remove sediment from per-treatment structures and/or internal forebays	Annually, or as required
Remedial Actions	Repair/rehabilitate inlets, outlet, overflows and vents	As required
Monitoring	Inspect/check all inlets, outlets, vents, and overflows to ensure that they are in good condition and operating as designed	Annually
	Survey inside of tank for sediment build-up and remove if necessary	Every 5 years or as required

1.3.2 Permeable Paving

In order to maintain the functioning of the permeable paving, the following maintenance requirements should be adhered to:

Table 21.3 Operation and maintenance requirements for permeable paving		
Maintenance Schedule	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 where water runs onto pervious surface from adjacent impermeable areas as this area is most likely to collect the most sediment
Occasional maintenance	Stabilise and mow contributing and adjacent areas	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 50mm of level of the paving	As required
	Remedial work to any depressions, rutting and cracked or broken blocks considered detrimental to the structural performance or a hazard to users, and replace lost jointing material	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	Initial inspection	Monthly for three months after installation
	Inspect for evidence of poor operation and/or weed growth – if required take remedial action	Three-monthly, 48h after large storms in first six months
	Inspect silt accumulation rate and establish appropriate brushing frequencies	Annually
	Monitor inspection chambers	Annually

1.4 Management of Accidental Spillage of Pollutants on Site

In the event of an accidental spillage of pollutants on site, immediate and effective action must be taken to prevent harm to the environment, human health, and property. The following procedures should be implemented:

1.4.1 Identification and Containment of Spill:

- Immediately Assess the Spill: Identify the nature of the pollutant (e.g., oil, chemicals, fuel) to determine the best course of action.
- Isolate the Area: Restrict access to the affected area to prevent exposure to personnel or the general public.
- Contain the Spill: Use appropriate containment materials such as spill barriers, sandbags, or absorbent booms to limit the spread of the spillage. Ensure that the pollutant does not enter drains, watercourses, or sensitive environmental areas.

1.4.2 Spill Response Equipment:

- Ensure that suitable spill response kits are readily available at key locations on site. These kits should contain absorbents, personal protective equipment (PPE), neutralizing agents (if applicable), and disposal containers.
- For liquid spills, use absorbent pads, granules, or blankets to soak up the spill and prevent further spread.

1.4.3 Notification and Reporting:

- Alert Relevant Authorities: Notify the appropriate authorities, such as the Environmental Agency (EA), local environmental protection body, or the emergency services, if the spill is significant or poses a risk to the environment.
- Report the Spill: Complete a detailed report outlining the circumstances of the spill, the materials involved, the containment measures taken, and any corrective actions carried out. Keep this record for future reference.

1.4.4 Clean-up and Disposal:

- Carefully remove any contaminated materials, including absorbents and impacted soil or surface materials. These materials must be disposed of following the regulations for hazardous waste disposal.
- Clean affected surfaces and areas thoroughly, using appropriate cleaning agents and procedures to remove any residual pollutants.
- If Necessary, for larger or more complex spills, consider hiring professional environmental contractors to manage the clean-up and ensure that all necessary actions are taken.

1.4.5 Review and Prevention:

- Investigate the cause of the spill to understand how it occurred and to determine if there were any procedural or equipment failures.
- Based on the findings, update the site's spill prevention plan, providing additional safeguards and training to prevent future incidents.
- Ensure all personnel are trained in spill response protocols, the use of spill kits, and safe handling practices for hazardous materials.

1.4.6 Environmental Monitoring:

- After the spill has been cleaned up, monitor surrounding soil, water, and air quality to ensure that no contaminants have been left behind. If necessary, conduct environmental testing to verify that there is no long-term impact.

1.5 General Drainage Maintenance Specification

1.5.1 Inlet Structures and Inspection Chambers

- Inlet structures such as rainwater downpipes, road gullies and channel drains should be free from obstruction at all times to allow free flow through the SuDS
- Inspection Chambers and Rodding Eyes are used on bends or where pipes come together. They allow access and cleaning to the system if necessary.

Inlet Structures and Inspection Chambers	
Regular Maintenance	Frequency
Inlet Structures	
Inspect rainwater downpipes, channel drains and road gullies, removing obstructions and silt as necessary. Check that there is no physical damage.	Monthly
Trim vegetation 1m min surround to structures and keep area free from silt and debris	
Inspection Chambers and below ground control chambers.	
Remove cover and inspect, ensuring that the water is flowing freely and that the exit route for water is unobstructed. Remove debris and silt.	Annually
Undertake inspection after leaf fall in Autumn	
Occasional Maintenance	
Check topsoil levels are 20mm above edges of chambers to avoid mower damage.	As necessary
Remedial Work	
Repair physical damage if necessary	As required

1.5.2 Below ground drainage pipes

- Below ground drainage pipes convey water to the SuDS system. They should always be free from obstruction to allow free flow.

Below Ground Drainage Pipes	
Regular Maintenance	Frequency
Inspect and identify any areas that are not operating correctly. If required, take remedial action.	Monthly for 3 months then annually
Remove debris from the catchment surface (where it may cause risks to performance)	Monthly
Remove sediment from pre-treatment inlet structures and inspection chambers.	Annually or as required
Maintain vegetation to designed limits within the vicinity of below ground drainage pipes and tanks.	Monthly or as required
Remedial Work	
Repair physical damage if necessary	As required
Monitoring	
Inspect all inlets, outlets and vents to ensure that they are in good conditions and operating as designed.	Annually
Survey inside of pipe runs for sediment build up and remove if necessary.	Every 5 years or as required

1.6 Arisings Storage & Disposal Arrangements

- **Maintenance Access**
 - Designated access routes will be established to facilitate safe and efficient maintenance activities.
 - Access points will be positioned to minimize disruption to site operations and ensure safety.
 - Maintenance personnel will follow established safety protocols, including the use of appropriate PPE.
- **Arisings Storage & Disposal**
 - Any green waste, organic sediment, or debris removed during maintenance will be stored in designated areas away from the watercourse.
 - Green waste and organic material may be spread across crops where appropriate to promote natural decomposition.
 - Non-biodegradable waste, such as plastics or construction debris, will be collected separately and disposed of site in accordance with environmental regulations.
 - Hazardous materials, if encountered, will be stored in sealed containers and disposed of following regulatory guidelines.
- **Environmental Protection Measures**
 - Regular inspections will be conducted to ensure waste is managed correctly and does not pose a risk of contamination.
 - Spill response procedures will be in place to address any accidental leakage or discharge.
 - Maintenance records will be kept to track waste disposal and ensure compliance with regulations.

1.7 Health and Safety Risks of Maintenance Activities:

The following outlines common health and safety risks associated with maintenance activities, along with recommended actions for managing these risks:

1.7.1 Physical Injuries:

- **Risks:**
 - Slips, trips, and falls due to wet surfaces or uneven ground.
 - Being struck by falling objects, tools, or equipment.
 - Cuts, burns, or abrasions from using tools or machinery.
 - Injury from handling heavy or awkward items.
- **Mitigation:**
 - Ensure that walkways and working areas are clear of obstacles, dry, and well-maintained.
 - Use appropriate personal protective equipment (PPE), such as hard hats, gloves, and safety footwear.
 - Train workers on safe lifting techniques and the proper handling of materials and tools.
 - Secure tools and equipment to prevent them from falling.

1.7.2 Exposure to Hazardous Substances:

- **Risks:**
 - Exposure to chemicals, solvents, and asbestos (if present) during maintenance work.
 - Dust, fumes, or vapors from machinery, paints, or cleaning agents.
- **Mitigation:**
 - Ensure workers are provided with the correct PPE, including respirators or face masks when necessary.
 - Conduct air monitoring to detect hazardous levels of fumes or dust.
 - Implement ventilation systems in enclosed spaces to reduce the concentration of harmful substances.

- Provide training on the proper handling, storage, and disposal of hazardous materials.
- Use safer alternatives to hazardous chemicals wherever possible.

1.7.3 **Confined Space Work:**

- Risks:
 - Workers entering confined spaces (e.g., tanks, pits, ducts) may face risks of asphyxiation, drowning, or exposure to toxic gases.
- Mitigation:
 - Implement a confined space entry program, including air quality testing, ventilation, and continuous monitoring of oxygen levels.
 - Provide workers with proper training and ensure they have rescue equipment readily available.
 - Ensure that a permit-to-work system is in place to control and monitor confined space activities.
 - Maintain communication at all times with workers inside confined spaces.

1.7.4 **Electrical Hazards:**

- Risks:
 - Risk of electrocution or electrical burns when maintaining electrical systems or equipment.
 - Contact with exposed wires or malfunctioning electrical tools.
- Mitigation:
 - Ensure all electrical systems are properly locked out and tagged out before maintenance begins.
 - Only qualified personnel should perform electrical work.
 - Inspect tools and equipment regularly for defects and repair or replace as necessary.
 - Provide PPE, such as rubber gloves and insulated tools, for electrical work.

1.7.5 **Equipment and Machinery Hazards:**

- Risks:
 - Injury from moving parts, entanglement, or accidental start-up of machinery during maintenance.
- Mitigation:
 - Implement lock-out/tag-out (LOTO) procedures to ensure machinery cannot be accidentally started during maintenance.
 - Provide proper training on the safe use and maintenance of machinery.
 - Perform regular inspections and maintenance on tools and equipment to ensure they are in good working order.

1.7.6 **Working at Heights:**

- Risks:
 - Falls from ladders, scaffolds, or roofs during maintenance work.
 - Falling tools or equipment that could injure workers below.
- Mitigation:
 - Use fall protection systems such as guardrails, safety nets, or personal fall arrest systems.
 - Ensure scaffolds and ladders are properly installed and maintained.
 - Train workers on working at height safety protocols.
 - Use tool lanyards to prevent tools from falling and causing injury.

1.7.7 **Manual Handling Risks:**

- Risks:
 - Back injuries, strains, and sprains from lifting heavy or awkward objects.
- Mitigation:
 - Train workers in proper lifting techniques to avoid injury.
 - Use mechanical aids such as cranes, hoists, or forklifts to handle heavy materials.
 - Limit manual lifting to tasks that can be performed safely without assistance.

1.7.8 **Noise and Vibration:**

- Risks:
 - Prolonged exposure to high noise levels can lead to hearing loss.
 - Vibration from power tools and machinery can cause hand-arm vibration syndrome (HAVS) or musculoskeletal disorders.
- Mitigation:
 - Use noise-dampening equipment and hearing protection (earplugs, earmuffs) in high-noise areas.
 - Implement regular hearing checks for workers exposed to high noise levels.
 - Provide vibration-reducing gloves and limit workers' exposure to vibrating tools.

1.7.9 **Weather-Related Risks:**

- Risks:
 - Adverse weather conditions (e.g., high winds, heavy rain, extreme heat or cold) can increase the risk of accidents.
 - Heat stress or hypothermia from prolonged exposure to extreme temperatures.
- Mitigation:
 - Monitor weather conditions regularly and reschedule maintenance activities if necessary to avoid hazardous conditions.
 - Ensure adequate hydration for workers during hot weather and provide protective clothing during cold conditions.
 - Implement shelter or shade for workers in extreme weather and limit exposure to hazardous weather.

1.7.10 **Fire and Explosion Risks:**

- Risks:
 - Sparks from machinery or electrical work could ignite flammable materials, leading to fires or explosions.
- Mitigation:
 - Ensure that fire extinguishers, fire blankets, and other emergency firefighting equipment are available on-site.
 - Conduct regular fire drills and ensure workers know how to respond in the event of a fire.
 - Use non-sparking tools and maintain safe distances from flammable materials during maintenance work.

2 Existing Watercourse Maintenance Regime

2.1 Drainage Ditch

Watercourses and drainage ditches require correct maintenance in order to allow surface water to flow freely, this will also reduce the risks of flooding. Correctly maintained watercourses can also create an excellent habitat for wildlife. There are specific maintenance procedures that should be followed in order to correctly maintain the ditch.

In order to maintain the functioning of a drainage ditch, the following requirements should be adhered to:

Watercourses and Drainage Ditches	
Regular Maintenance	Frequency
Keep Watercourse Free of Debris 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 back 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.	Monthly
Keep growth of vegetation under control 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 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 excess Silt 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; 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.	As required.

- The silts must be 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 a material may be hazardous. Contact the Environment Agency for advice.

2.2 Culvert and Headwalls

- Culverts allow the drainage ditch to flow freely under the access road. They should always be free from obstruction to allow free flow.
- Headwalls are used as an outlet to the drainage ditch from the surface water network; they are also used as an inlet and outlet for the culvert.

Culverts and Headwalls	
Regular Maintenance	Frequency
Inspect and identify any areas that are not operating correctly. If required take remedial action.	Monthly for 3 months then annually
Remove debris from the catchment surface (where it may cause risks to performance)	Monthly
Remove sediment from pre-treatment inlet structures and inspection chambers.	Annually or as required
Maintain vegetation to designed limits within the vicinity of below ground drainage pipes and tanks to avoid	Monthly or as required
Remedial Work	
Repair physical damage if necessary	As required
Monitoring	
Inspect all inlets, outlets and vents to ensure that they are in good conditions and operating as designed.	Annually
Survey inside of pipe runs for sediment build up and remove if necessary.	Every 5 years or as required

3 Periodic Evaluation of the Maintenance Regime

To ensure the continued effectiveness of the maintenance activities and to identify and address potential risks, a periodic evaluation of the maintenance regime will be scheduled and carried out. This evaluation is crucial to ensure that all maintenance procedures remain aligned with industry best practices, regulatory requirements, and the operational goals of the project. The following outlines the process and key considerations for the periodic evaluation:

3.1.1 Frequency of Evaluation:

- The maintenance regime will be evaluated at regular intervals, as determined by the nature of the work and the criticality of the system being maintained. Typically, evaluations will occur:
 - **Quarterly:** For high-risk or complex systems that require frequent oversight.
 - **Annually:** For less critical systems or where long-term monitoring and adjustments are needed.
 - **Post-Maintenance Inspections:** After the completion of significant maintenance tasks or changes to the site or infrastructure.

3.1.2 Review of Maintenance Activities:

- The evaluation will involve reviewing all performed maintenance activities to ensure they have been carried out in accordance with the prescribed procedures. This includes:
 - Assessing whether the planned maintenance tasks have been executed on time and as per the schedule.
 - Checking for any missed or delayed maintenance actions that could potentially lead to risks or failures.
 - Evaluating the effectiveness of the maintenance performed, including whether it successfully addressed identified issues.
 - Reviewing records of inspections, repairs, and replacements.

3.1.3 Performance Monitoring:

- Key performance indicators (KPIs) will be established to track the success and impact of maintenance activities. These may include:
 - Equipment uptime and downtime.
 - Frequency of breakdowns or failures.
 - Cost of maintenance versus budget.
 - Response times to critical issues or failures.
 - Compliance with safety regulations and risk assessments.
 - Efficiency and sustainability of maintenance procedures.

3.1.4 Inspection and Testing:

- Regular inspections and testing of systems and equipment will be incorporated into the evaluation process. This includes:
 - Physical inspections of infrastructure and equipment to check for wear, tear, or any degradation.
 - Functional testing to verify that systems operate correctly after maintenance.
 - Stress testing or simulated fault conditions to assess the robustness of maintenance measures.

3.1.5 Feedback from Staff and Stakeholders:

- Feedback from maintenance personnel, site supervisors, and other stakeholders will be collected to understand any operational challenges or improvements needed. This includes:
 - Gathering input from workers who perform the maintenance activities to identify any difficulties or inefficiencies encountered.
 - Discussing safety concerns and suggestions for improving safety practices during maintenance activities.
 - Reviewing any customer or client feedback related to the maintenance process.

3.1.6 Identification of Improvements and Updates:

- Based on the evaluation findings, the maintenance regime will be updated and adjusted as necessary. This may include:
 - Revising maintenance schedules based on performance trends or new technology developments.
 - Incorporating new safety measures or updated safety protocols.
 - Introducing more efficient or cost-effective methods and tools.
 - Addressing any areas of non-compliance or failure to meet quality standards.

3.1.7 Documentation and Reporting:

- All evaluations, findings, and adjustments to the maintenance regime will be documented comprehensively. Key reports will include:
 - Evaluation summary with identified issues and corrective actions.
 - Updated maintenance schedules, procedures, and protocols.
 - Record of actions taken to address any performance deficiencies or safety issues.
 - Recommendations for further improvements and the timeline for implementing them.

The evaluation process will be part of a continuous improvement cycle, ensuring that maintenance activities evolve to meet changing conditions, new challenges, and advancements in technology or best practices.

The periodic evaluation will also include ensuring that all maintenance activities are compliant with relevant industry regulations, local authorities' requirements, and any contractual obligations.

4 Formal Procedure for Changes to the Maintenance Regime Following Evaluation:

To ensure the ongoing effectiveness and adaptability of the maintenance regime, a formal procedure will be in place to allow for changes and improvements based on the findings of the periodic evaluations. This procedure ensures that any modifications are properly managed, documented, and implemented in a structured manner, aligning with operational goals, safety standards, and regulatory requirements. The key steps in this process are outlined below:

Identification of Need for Change:

- Following each evaluation, any areas where the maintenance regime may need adjustment will be identified. This could be due to:
 - If performance indicators, such as equipment failures or downtime, show that current maintenance practices are insufficient.
 - If new safety risks or hazards are identified during the evaluation that require changes to protocols.
 - Introduction of new technology or maintenance methods that could improve efficiency or effectiveness.
 - Updates to industry standards or regulatory requirements that mandate changes in maintenance practices.
 - Input from those directly involved in maintenance activities may highlight areas for improvement.

Documentation of Proposed Changes:

- Once the need for change has been identified, a proposal for changes to the maintenance regime will be documented. This includes:
 - A clear description of the proposed change(s).
 - The rationale for the change, including any issues or findings from the evaluation that support the change.
 - Expected outcomes and benefits, such as improved efficiency, reduced downtime, or enhanced safety.
 - An assessment of any associated costs, resource requirements, or scheduling implications.
 - Compliance considerations to ensure that any proposed changes adhere to regulatory requirements

Review and Approval:

- The proposed changes will be reviewed by relevant stakeholders to ensure they align with the broader operational objectives and regulatory standards. This step includes:
 - The maintenance team, site managers, and relevant technical experts will assess the proposed changes for feasibility, practicality, and safety.
 - Depending on the scope of the change, approval may be required from the client, regulatory bodies, or other key stakeholders.
 - A risk assessment may be conducted to evaluate any potential risks associated with the change and identify mitigation strategies.

Update of Maintenance Procedures:

- Once the changes have been approved, the maintenance procedures will be updated to reflect the new approach. This will include:
 - Detailed updates to maintenance schedules, tasks, and responsibilities.
 - Updating manuals, checklists, and procedural documents to incorporate the new practices.
 - If the changes involve new equipment, methods, or safety procedures, training sessions will be organised for all relevant personnel to ensure they are equipped to implement the updated regime.

Communication and Implementation:

- Clear communication will be provided to all stakeholders regarding the updated maintenance regime. This includes:
 - Ensuring that the maintenance team and other staff members are fully informed of the changes and their role in the updated procedures.
 - If the changes impact external contractors or partners, they will be informed promptly and provided with any necessary instructions or guidelines.
- The implementation of the changes will be carried out according to the updated maintenance schedule, with monitoring to ensure smooth execution.

5 Foul Treatment Plant Maintenance