

## Drainage Maintenance Schedule

| Schedule            | Feature              | Required Action                                                                                                                               | Frequency                                              |
|---------------------|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|
| Regular Maintenance | Rainwater Harvesting | Inspection of the Tank for Debris and Sediment Build-Up, Inlets/ Outlets/ Withdrawal Devices, Overflow Areas, Pumps and Filters.              | Annually (and following poor performance)              |
|                     |                      | Cleaning of Tank, Inlets, Outlets, Gutters, Withdrawal Devices and Roof Drain Filters of Silts and other Debris.                              | Annually (and following poor performance).             |
|                     | Green Roofs          | Remove Debris and Litter to Prevent Clogging of Inlet Drains and Interference with Plant Growth.                                              | Six Monthly and Annually or as required                |
|                     |                      | During Establishment (i.e. year one), Replace Dead Plants as required.                                                                        | Monthly (but usually responsibility of manufacturer)   |
|                     |                      | Post Establishment, Replace Dead Plants as Required (where >5% of coverage).                                                                  | Annually (In autumn)                                   |
|                     |                      | Remove Fallen Leaves and Debris from Deciduous Plant Foliage.                                                                                 | Six Monthly or as required                             |
|                     |                      | Remove Nuisance and Invasive Vegetation, Including Weeds.                                                                                     | Six Monthly or as required                             |
|                     |                      | Mow Grasses, Prune Shrubs and Manage Other Planting (if appropriate) as Required – Clippings Should be Removed and not Allowed to Accumulate. | Six Monthly or as required                             |
|                     | Infiltration Systems | Remove Litter, Debris and Trash.                                                                                                              | Monthly                                                |
|                     |                      | Cut Grass – for Landscaped Areas and Access Routes.                                                                                           | Monthly (during growing season) or as required         |
|                     |                      | Cut Grass – Meadow Grass in and Around Basin.                                                                                                 | Half yearly: spring (before nesting season) and autumn |
|                     |                      | Manage Other Vegetation and Remove Nuisance Plants.                                                                                           | Monthly at start, then as required                     |
|                     | Filter Strips        | 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)                   |
|                     | Filter Drains        | Remove Litter (inc leaf litter) and Debris from Filter Drain Surface, Access Chambers and Pre-Treatment Devices.                              | Monthly (or as required)                               |
|                     |                      | Inspect Filter Drain Surface, Inlet/ Outlet Pipework and Control Systems for Blockages, Clogging, Standing Water and Structural Damage.       | Monthly                                                |

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|  |                     | 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.                                                                                              | Six monthly, or as required                                                                                                                               |
|  | Swales              | 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, Outlets and Overflows for Blockages, and Clear if Required.                                                              | Monthly                                                                                                                                                   |
|  |                     | Inspect Infiltration Surfaces for Ponding, Compaction, Silt Accumulation, Record Areas Where Water is Ponding for > 48 Hours.            | Monthly, or when required                                                                                                                                 |
|  |                     | 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                                                                                                                                               |
|  | Bioretention        | Remove Litter and Surface Debris and Weeds.                                                                                              | Quarterly (or more frequently for tidiness or aesthetic reasons)                                                                                          |
|  |                     | Replace any Plants, to Maintain Planting Density.                                                                                        | As required                                                                                                                                               |
|  |                     | Remove Sediment, Litter and Debris Build-Up from Around Inlets or from Forebays.                                                         | Quarterly to biannually                                                                                                                                   |
|  | Trees               | Remove Litter and Debris.                                                                                                                | Monthly (or as required)                                                                                                                                  |
|  |                     | Manage Other Vegetation and Remove Nuisance Plants.                                                                                      | Monthly (at start, then as required)                                                                                                                      |
|  |                     | Inspect Inlets and Outlets.                                                                                                              | Inspect monthly                                                                                                                                           |
|  | Permeable Pavements | 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 manufacturers recommendations – |

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|  |                           |                                                                                                                                                                                                        | pay attention to areas where water runs onto pervious surface from adjacent impermeable areas as this area is most likely to collect the most sediment |
|  | Attenuation Storage Tanks | 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                                                                                                                                               |
|  | Detention Basins          | Remove Litter and Debris.                                                                                                                                                                              | Monthly                                                                                                                                                |
|  |                           | Cut Grass – for Spillways and Access Routes.                                                                                                                                                           | Monthly (during growing season), or as required                                                                                                        |
|  |                           | Cut Grass – Meadow Grass in and Around Basin.                                                                                                                                                          | Half yearly (spring – before nesting season, and autumn)                                                                                               |
|  |                           | Manage Other Vegetation and Remove Nuisance Plants.                                                                                                                                                    | Monthly (at start, then as required)                                                                                                                   |
|  |                           | Inspect Outlets, Inlets and Overflows for Blockages and Clear if Required.                                                                                                                             | Monthly                                                                                                                                                |
|  |                           | Inspect Banksides, Structures, Pipework etc for Evidence of Physical Damage.                                                                                                                           | Monthly                                                                                                                                                |
|  |                           | Inspect Inlets and Facility Surface for Silt Accumulation. Establish Appropriate Silt Removal Frequencies.                                                                                             | Monthly (for first year), then annually or as required                                                                                                 |
|  |                           | Check any Penstocks and Other Mechanical Devices.                                                                                                                                                      | Annually                                                                                                                                               |
|  |                           | Tidy All Dead Growth Before Start of Growing Season.                                                                                                                                                   | Annually                                                                                                                                               |
|  |                           | Remove Sediment from Inlets, Outlets and Forebay.                                                                                                                                                      | Annually (or as required)                                                                                                                              |
|  |                           | Manage Wetland Plants in Outlet Pool – Where Provided.                                                                                                                                                 | Annually                                                                                                                                               |
|  | Ponds and Wetlands        | Remove Litter and Debris.                                                                                                                                                                              | Monthly (or as required)                                                                                                                               |

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|  |  | Cut the Grass – Public Areas.                                                                                                                                                                                                          | Monthly (during growing season)                         |
|  |  | Cut the Meadow Grass.                                                                                                                                                                                                                  | Half yearly (spring, before nesting season, and autumn) |
|  |  | Inspect Marginal and Bankside Vegetation and Remove Nuisance Plants (for First 3 Years).                                                                                                                                               | Monthly (at start then as required)                     |
|  |  | Inspect Inlets, Outlets, Banksides, Structures, Pipework etc for Evidence of Blockage and/ or Physical Damage.                                                                                                                         | Monthly                                                 |
|  |  | Inspect Water Body for Signs of Poor Water Quality.                                                                                                                                                                                    | Monthly (May – October)                                 |
|  |  | Inspect Silt Accumulation Rates un any Forebay and in Main Body of the Pond and Establish Appropriate Removal Frequencies; Undertake Contamination Testing Once Some Build-Up Has Occurred, to Inform Management and Disposal Options. | Half yearly                                             |
|  |  | Check Any Mechanical Devices, e.g. Penstocks.                                                                                                                                                                                          | Half yearly                                             |
|  |  | Hand Cut Submerged and Emergent Aquatic Plants (at minimum of 1.0m above pond base; include max 25% of pond surface).                                                                                                                  | Annually                                                |
|  |  | Remove 25% of Bank Vegetation from Waters Edge to a Minimum of 1m Above Water Level.                                                                                                                                                   | Annually                                                |
|  |  | Tidy All Dead Growth (scrub clearance) Before Start of Growing Season (note: tree maintenance is usually part of overall landscape management contract).                                                                               | Annually                                                |
|  |  | Remove Sediment and Planting from one Quadrant of the Main Body of Ponds Without Sediment Forebays.                                                                                                                                    | Every 1 -5 years, or as required                        |
|  |  | Remove Sediment from any Forebay.                                                                                                                                                                                                      | Annually                                                |

| Schedule               | Feature              | Required Action                             | Frequency                      |
|------------------------|----------------------|---------------------------------------------|--------------------------------|
| Occasional Maintenance | Rainwater Harvesting | Cleaning and/or replacement of any Filters. | Three monthly (or as required) |
|                        | Infiltration Systems | Reseed Areas of Poor Vegetation Growth.     | Annually or as required        |
|                        |                      | Prune and Trim Trees and Remove Cuttings.   | As required                    |

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|  |                     | Remove Sediment from Pre-Treatment System when 50% Full.                                                                                            | As required                                                                                                            |
|  | Filter Strips       | Reseed Areas of Poor Vegetation Growth; Alter Plant Types to Better Suit Conditions, if required.                                                   | As required or if bare soil is exposed over                                                                            |
|  | Filter Drains       | Remove or Control Tree Roots Where They are Encroaching the Sides of the Filter Drain, Using Recommended Methods (e.g. NJUG, 2007 or BS 3998:2010). | As required                                                                                                            |
|  |                     | At Locations with High Pollution Loads, Remove Surface Geotextile and Replace, and Wash or Replace Overlaying Filter Medium.                        | Five yearly, or as required                                                                                            |
|  |                     | Clear Perforated Pipework of Blockages.                                                                                                             | As required                                                                                                            |
|  | Bioretention        | Infill any Holes or Scour in the Filter Medium, Improve Erosion Protection if Required.                                                             | As required                                                                                                            |
|  |                     | Repair Minor Accumulations of Silt by Raking Away Surface Mulch, Scarifying Surface of Medium and Replacing Mulch.                                  | As required                                                                                                            |
|  | Trees               | Check Tree Health and Manage Tree Appropriately.                                                                                                    | Annually                                                                                                               |
|  |                     | Remove Silt Build-Up from Inlets and Surface and Replace Mulch as Necessary.                                                                        | Annually, or as required                                                                                               |
|  |                     | Water                                                                                                                                               | As required                                                                                                            |
|  | Permeable Pavements | Stabilise and Mow Contributing and Adjacent Areas.                                                                                                  | As required                                                                                                            |
|  |                     | Removal of Weeds or Management Using Glyphosate Applied Directly into the Weeds by an Application Rather Than Spraying.                             | As required – once per year on less frequently used pavements                                                          |
|  | Detention Basins    | Reseed Areas if Poor Vegetation Growth.                                                                                                             | As required                                                                                                            |
|  |                     | Prune and Trim any Trees and Remove Cuttings.                                                                                                       | Every 2 years, or as required                                                                                          |
|  |                     | Remove Sediment from Inlets, Outlets, Forebay and Main Basin when Required.                                                                         | Every 5 years, or as required (likely to be minimal requirements where effective upstream source control is provided). |
|  | Ponds and Wetlands  | Remove Sediment from the Main Body of Big Ponds when Pool Volume is Reduced by 20%.                                                                 | With effective pre-treatment, this will only be required rarely, e.g. every 25-50 years                                |

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| Schedule            | Feature                      | Required Action                                                                 | Frequency                                                                                 |
|---------------------|------------------------------|---------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|
| Routine Maintenance | Proprietary Treatment System | Remove Litter and Debris and Inspect for Sediment, Oil and Grease Accumulation. | Six Monthly                                                                               |
|                     |                              | Change the Filter Media.                                                        | As recommended by manufacturer                                                            |
|                     |                              | Remove Sediment, Oil, Grease and Floatables.                                    | As necessary – indicated by system inspections or immediately following significant spill |

| Schedule         | Feature                      | Required Action                                                                                                                                                                            | Frequency    |
|------------------|------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| Remedial Actions | Rainwater Harvesting         | Repair of Overflow Erosion Damage or Damage to Tank.                                                                                                                                       | As required  |
|                  |                              | Pump Repairs.                                                                                                                                                                              | As required  |
|                  | Green Roofs                  | If Erosion Channels are Evident, These Should be Stabilised with Extra Soil Substrate Similar to the Original Material, and Sources of Erosion Damage Should be Identified and Controlled. | As required  |
|                  |                              | If Drain Inlet Has Settled, Cracked or Moved Investigate and Repair as Appropriate.                                                                                                        | As required  |
|                  | Infiltration Systems         | Repair Erosion or other Damage by Reseeding or Re-Turfing.                                                                                                                                 | As required  |
|                  |                              | Realign the Rip-Rap.                                                                                                                                                                       | As required  |
|                  |                              | Repair or Rehabilitate Inlets, Outlets and Overflows.                                                                                                                                      | As required  |
|                  |                              | Rehabilitate Infiltration Surface using Scarifying and Spiking Techniques if Performance Deteriorates.                                                                                     | As required. |
|                  |                              | Relevel Uneven Surfaces and Reinstall Design Levels.                                                                                                                                       | As required  |
|                  | Proprietary Treatment System | Replace Malfunctioning Parts or Structures.                                                                                                                                                | As required  |
|                  | Filter Strips                | Repair Erosion or Other Damage by Re-Turfing or Re-Seeding.                                                                                                                                | As required  |
|                  |                              | Relevels Uneven Surfaces and Reinstall Design Levels.                                                                                                                                      | As required  |
|                  |                              | Scarify and Spike Topsoil to Improve Infiltration Performance, Break Up Silt                                                                                                               | As required  |

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|  |                           | Deposits and Prevent Compaction of the Soil Surface.                                                                                                                                  |                                                                                                          |
|  |                           | Remove Build Up of Sediment on Upstream Gravel Trench, Flow Spreader or at Top of Filter Strip.                                                                                       | As required                                                                                              |
|  |                           | Remove and Dispose of Oils or Petrol Residues Using Safe Standard Practices.                                                                                                          | As required                                                                                              |
|  | Swales                    | Repair Erosion or Other Damage by Re-Turfing or Reseeding.                                                                                                                            | As required                                                                                              |
|  |                           | Relevel Uneven Surfaces and Reinstall Design Levels.                                                                                                                                  | As required                                                                                              |
|  |                           | Scarify and Spike Topsoil Layer to Improve Infiltration Performance, Break Up Silt Deposits and Prevent Compaction of the Soil Surface.                                               | As required                                                                                              |
|  |                           | Remove Build-Up of Sediment on Upstream Gravel Trench, Flow Spreader or at Top of Filter Strip.                                                                                       | As required                                                                                              |
|  |                           | Remove and Dispose of Oils or Petrol Residues Using Safe Standard Practices.                                                                                                          | As required                                                                                              |
|  | Bioretention              | Remove and Replace Filter Medium and Vegetation Above.                                                                                                                                | As required but likely to be > 20 years                                                                  |
|  | Permeable Pavements       | Remediate Any Landscaping which, Through Vegetation Maintenance or Soil Slip, has been Raised to within 50mm of the 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) |
|  | Attenuation Storage Tanks | Repair/ Rehabilitate Inlets, Outlets, Overflows and Vents.                                                                                                                            | As required                                                                                              |
|  | Detention Basins          | Repair Erosion or Other Damage by Reseeding or Re-Turfing.                                                                                                                            | As required                                                                                              |
|  |                           | Realignment of Rip-Rap.                                                                                                                                                               | As required                                                                                              |
|  |                           | Repair/ Rehabilitation of Inlets, Outlets and Overflows.                                                                                                                              | As required                                                                                              |
|  |                           | Relevel Uneven Surfaces and Reinstall Design Levels.                                                                                                                                  | As required                                                                                              |
|  |                           | Repair Erosion or Other Damage.                                                                                                                                                       | As required                                                                                              |

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|  | Ponds and Wetlands | Replant, where necessary.                              | As required |
|  |                    | Aerate Pond When Signs of Eutrophication are Detected. | As required |
|  |                    | Realign Rip-Rap or Repair Other Damage.                | As required |
|  |                    | Repair / Rehabilitate Inlets, Outlets and Overflows.   | As required |

| Schedule            | Feature      | Required Action                                                                                                                                                                                          | Frequency                        |
|---------------------|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|
| Regular Inspections | Green Roofs  | Inspect all components including soil Substrate, Vegetation, Drains, Irrigation Systems, Membranes and Roof Structure for Proper Operation, Integrity of Waterproofing and Structural Stability.         | Annually and after severe storms |
|                     |              | Inspect Soil Substrate for Evidence of Erosion Channels and Identify any Sediment Sources.                                                                                                               | Annually and after severe storms |
|                     |              | Inspect Drain Inlets to Ensure Un-Restricted Run-off from the Drainage Layer to the Conveyance or Roof Drain System.                                                                                     | Annually and after severe storms |
|                     |              | Inspect Underside of Roof for Evidence of Leakage.                                                                                                                                                       | Annually and after severe storms |
|                     | Bioretention | Inspect Infiltration Surfaces for Silting and Ponding, Record De-Watering Time of the Facility and Assess Standing Water Levels in Underdrain (if appropriate) to Determine if Maintenance is Necessary. | Quarterly                        |
|                     |              | Check Operation of Underdrains by Inspection of Flows After Rain.                                                                                                                                        | Annually                         |
|                     |              | Assess Plants for Disease Infection, Poor Growth, Invasive Species etc and Replace as Necessary.                                                                                                         | Quarterly                        |
|                     |              | Inspect Inlets and Outlets for Blockages.                                                                                                                                                                | Quarterly                        |

| Schedule   | Feature              | Required Action                                                                                                 | Frequency   |
|------------|----------------------|-----------------------------------------------------------------------------------------------------------------|-------------|
| Monitoring | Infiltration Systems | Inspect Inlets, Outlets and Overflows for Blockages and Clear if Required.                                      | Monthly     |
|            |                      | Inspect Banksides, Structures, Pipework, etc for Evidence of Physical Damage.                                   | Monthly     |
|            |                      | Inspect Inlets and Pre-Treatment Systems for Silt Accumulation; Establish Appropriate Silt Removal Frequencies. | Half Yearly |
|            |                      | Inspect Infiltration Surfaces for Compaction and Ponding.                                                       | Monthly     |

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|  | Proprietary Treatment System | Inspect for Evidence of Poor Operation.                                                                                      | Six monthly                                                    |
|  | Attenuation Storage Tanks    | Survey Inside of Tank for Sediment Build-Up and Remove if Necessary.                                                         | Every 5 years or as required                                   |
|  |                              | Inspect/ Check all Inlets, Outlets, Vents and Overflows to Ensure that they are in Good Condition and Operating as Designed. | Annually                                                       |
|  | Filter Strips                | Inspect Silt Accumulation Rates and Establish Appropriate Removal Frequencies.                                               | Half yearly                                                    |
|  | Permeable Pavements          | 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, 48 hours after large storms in first six months |
|  |                              | Inspect Silt Accumulation Rates and Establish Appropriate Brushing Frequencies.                                              | Annually                                                       |
|  |                              | Monitor Inspection Chambers.                                                                                                 | Annually                                                       |