

Citylabs

Citylabs4.0 - Drainage Maintenance Plan

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1.1 Maintenance

The proposed drainage system outlined in this section must be managed and appropriately maintained according to the sections below. It considers necessary maintenance actions for the SuDS drainage components in the system (section 1.1.6) to sustain efficiency and long-term performance of the system.

The maintenance plan specifies the frequency of routine tasks necessary for the day-to-day management of surface water, flood prevention, flow regulation, and water quality protection. Additionally, site activities that may place extra strain on the network, such as future construction works, are considered and may necessitate additional maintenance, as discussed in section 1.1.7 Additional Maintenance.

The SuDS at Citylabs 4.0 are designed to be easily maintained, involving:

- General Visual Inspections: period walks around the site to identify any areas of ponding or accumulating water
- Routine Care: Daily activities such as collecting litter, mowing the grass, and inspecting the inlets and outlets where water flows in and out of the SuDS features.
- Periodic Tasks: Occasionally managing pond vegetation and removing any accumulated silt from the SuDS features.
- Vegetation Management: Frequency to be adjusted to suit seasonal growth periods and requirements of planting specification
- Silt removal: following major rainfall events, an inspection of surface features (gulleys, slot drains and channels) should inform sweeping and jetting to remove accumulated silt deposits
- Drainage inspections: Quarterly visual inspection inside chambers and manholes, requiring the removal of covers, to identify the presence of blockages and accumulation of water
- Repair Work: Addressing any necessary repairs to ensure the system remains functional.

1.1.1 Basis of Design and Maintenance

Surface and Combined Network (Pipes and Chambers)

The surface water network (S1.000 – S1.006) which connects to the combined network necessitates consistent and thorough maintenance to ensure its optimal functionality. Regular upkeep is essential to prevent any blockages that could hinder the flow of water through the system. Such obstructions can significantly diminish the system's capacity to convey water, potentially leading to flooding in areas upstream of the blockage.

Oversized Pipe

Oversized precast concrete pipe to act as attenuation storage volume during heavy rainfall events is proposed within the surface water network to provide surface water storage for the Citylabs 4.0. Discharge from the oversized pipe is controlled using a Hydrobake flow control in the chamber (SMH5) downstream of the oversized pipe, this is designed to restrict the discharge- from the site to the discharge rate of 10 l/s (as per the agreement with United Utilities) and to reduce the risk of flooding. The hydraulic design of the network is based on the specified attenuation volume; therefore, the maximum volume of the oversized pipe should be maintained as much as possible through regular maintenance. Any evidence of siltation or other debris in the oversized pipe should be removed as soon as they are identified in accordance with the manufacturer's requirements.

Geocellular Tank

Geocellular structures are a type of attenuation and infiltration system, intended to store surplus water when heavy rainfall causes the water volume from a site to be too high to be immediately directed into sewers or off-site drainage. Geocellular tanks will be equipped with an access module, allowing for surface entry to

facilitate remote camera inspections, as well as flushing and rodding operations. The build-up of silt will reduce the porosity of Geocellular tanks, necessitating regular maintenance to maintain their high porosity.

Back Drop and Rodding access

A backdrop is used to prevent step gradients in drainage pipes, which can hinder the flow's ability to collect silt. A rodding eye provides access for cleaning and is typically installed at bends where pipes converge, facilitating system maintenance.

Inlet and Outlet Structures

Inlet and outlet structures typically consist of conveyance pipes equipped with mesh guards. It's crucial to keep these structures clear of obstructions to ensure the smooth flow of water through SuDS. Monthly inspections should be conducted to remove any silt from slab aprons and debris.

1.1.2 Access

Maintaining the drainage system components may necessitate the use of large equipment or vehicles. Hathersage road provides an accessible route for heavy machinery onto the site. An access road along the east and south side of the site from Hathersage Road allows maintenance vehicles to access drainage system components that require maintenance.

1.1.3 SuDS Maintenance Summary

		Frequency
1.0	Inlets and Outlets	
1.1	Inspect monthly, remove silt from slab aprons and debris.	Monthly
2.0	Hard surfaces	
2.1	Sweep all paving regularly, sweep and suction brush permeable paving in autumn after leaf fall.	Monthly
3	Inspection and control chambers – not applicable	
3.1	Remove the cover and inspect to ensure water is flowing freely and the exit route is clear of obstructions. Clear away any debris and silt. Perform this inspection after the autumn leaf fall.	Quarterly
3.2	CCTV survey of drainage lines to ensure water is able to flow freely through the network and that no scour, encrustation or structural collapse has occurred within the drainage network	Annually
4	Inspect SuDS system regularly to check for damage or failure Undertake remedial work as required	

1.2 SuDS Scheme Checklist

SuDS schemes incorporate landscape features and control structures to manage runoff as it flows to site outfalls. The following lists the SuDS components and additional features that are be present on a site.

- Bioretention Area: landscaping in south side of the site allowing surface water from road to shed surface water onto soft landscaping

1.2.1 Maintenance Inspection Checklist

The checklist provided should be reviewed and added to as appropriate, to suit any changes to the external drainage system.

General Information			
Site Name / ID			
Site Location and co-ordinates			
Elements forming the SuDS scheme		Reference drawing(s)	
Inspection Frequency		Reference specification	
Type of development		Purpose of parts of the scheme	

Inspection Date				
	Details	Y/N	Action Required	Date Completed
General Inspection Items				
Is there any evidence of erosion, channeling, ponding (where not desirable) or other poor hydraulic performance?				
Is there any evidence of accidental spillages, oils, poor water quality, odours or nuisance insects?				
Have any health and safety risks been identified to either the public or maintenance operatives?				
Is there any deterioration oin the surface of permeable or porous surfaces (e.g. rutting, spreadhing of blocks or signas of ponding water)?				
Silt/sediment accumulation				
Is there any sediment accumulation at inlets (or other defined accumulation zones such as the surface of filter drains or infiltration basins and within proprietary devices)?				
If yes, state depth (mm) and extent.				
Is removal required?				
If yes, state waste disposal requirements and confirm that all waste management requirements have been complied with (consult environmental regulator).				
Is surface clogging visible (potentially problematic where water has to soak into the underlying construction or ground (e.g. underdraines swales or infiltration basins).				
Does paving require sweeping to remove silt?				
System blockages and litter build-up				
Is there evidence of litter accumulation in the system?				

If yes, is there a blockage risk?				
Is there any evidence of any other clogging or blockage of outlets or drainage paths?				
Vegetation and soft landscaping				
Is the vegetation condition satisfactory (densit, weed growth, coverage etc.)				
<i>To be checked against the approved landscaping maintenance regime.</i>				
Does any part of the system require weeding, pruning or mowing?				
<i>To be checked against the approved landscaping maintenance regime.</i>				
Is there any evidence of invasive species becoming established?				
If yes state action required.				
Infrastructure				
Is there any evidence of any accidental damage to the system (e.g. wheel ruts, broken access covers etc.)				
Is there any evidence of cross-connections or other unauthorised inflows?				
Is there any evidence of tampering with the flow controls?				
Are there any other matters that could affect the performance of the system in relation to the design objectives for hydraulic, water quality, biodiversity and visual amenity?				
Other observations				
Append any supporting information (e.g. photos).				
Suitability of current maintenance regime				
Continue as current				
Increase maintenance regime				
Decrease maintenance regime				
Next Inspection				
Proposed date for next inspection				

1.2.2 Additional Maintenance

To address additional maintenance for a drainage system, it's crucial to have a comprehensive plan that considers various factors and potential site activities. Here are some key aspects and possibilities for additional maintenance:

Key Aspects of Additional Maintenance

1. **Regular Inspections:** Schedule thorough inspections at least twice a year to identify any potential issues early. This helps in preventing minor problems from becoming major ones.
2. **Debris Removal:** Ensure that the drainage system is free from debris such as leaves, rubbish, and sediment. Regular cleaning can prevent blockages and maintain efficient water flow.
3. **Structural Repairs:** Check for any structural damage such as cracks or erosion in the drainage channels. Prompt repairs can prevent further deterioration and ensure the system remains effective.
4. **Monitoring Water Flow:** Monitor the water flow during heavy rains, as unusual pooling or slow drainage can signal a problem that needs attention. This issue is particularly common along the south side of the site, where landscaping directs additional surface water from the road into the soil, causing water to pool in the site's corners.

Factors Leading to Additional Maintenance

1. **Heavy Rainfall:** Areas with frequent heavy rainfall may require more frequent maintenance to handle the increased water volume and prevent flooding.
2. **Construction Activities:** Nearby construction can lead to increased debris and sediment in the drainage system, necessitating more frequent cleaning and inspections.
3. **Urbanisation:** Increased urbanisation can result in more surface runoff and greater demands on the drainage system. The site is encircled by buildings, except to the north beyond Hathersage Road, where a green area is located. Additionally, the site is less than 200 metres from Whitworth Park, which can absorb excess stormwater during heavy rainfalls.