Management and maintenance plan for surface water drainage.

The purpose of this Maintenance Plan is to ensure all those involved in the maintenance and ongoing operation of the Surface Water Drainage System (SWDS) understand its functionality and maintenance requirements in terms of supporting long-term performance for which it is intended.

This Maintenance Plan is part of a drainage policy/submission to the necessary authorities and: -

- Confirms that the site management has taken maintenance into account within the design of the existing structures and layout and in any future development plans.
- Demonstrates the compliance of the site management.
- Provides a guide to the site management team as to what the maintenance requirements of the system are and how they can be met most efficiently.
- Provides a basis for costing long term maintenance budgets (if required).
- Provides a working document for use on site.
- Enables continuous improvement and development in line with company goals.

The SWDS Maintenance plan provides and clarifies the following points:

- A description of the site - outlining how the overall drainage system works in practice and what it is trying to achieve. This will include flow routes, sub-catchments and any flow control features and outfall arrangements. It explains the visual and any biodiversity aspects of the plan.
- A plan of the site that identifies SWDS components, control structures, flow routes (including exceedance routing) outfalls and specific runoff sub-catchments and if any critical water levels.
- The access that is required to each SWDS component for maintenance purposes and a plan for the safe and sustainable removal and disposal of any waste that may periodically arise from within the drainage system.
- The maintenance schedule of work - itemising the tasks to be undertaken and the frequency at which they should be performed to give an acceptable long-term performance standard.
- A contact sheet and any additional guidance notes – e.g. action plan for dealing with accidental spillages.
- Photographic records of the monthly scheduled inspections – (This can pick up long-term changes that might not be apparent on a single visit, especially where inspections are carried out by different members of staff).

Magma Site – Description.

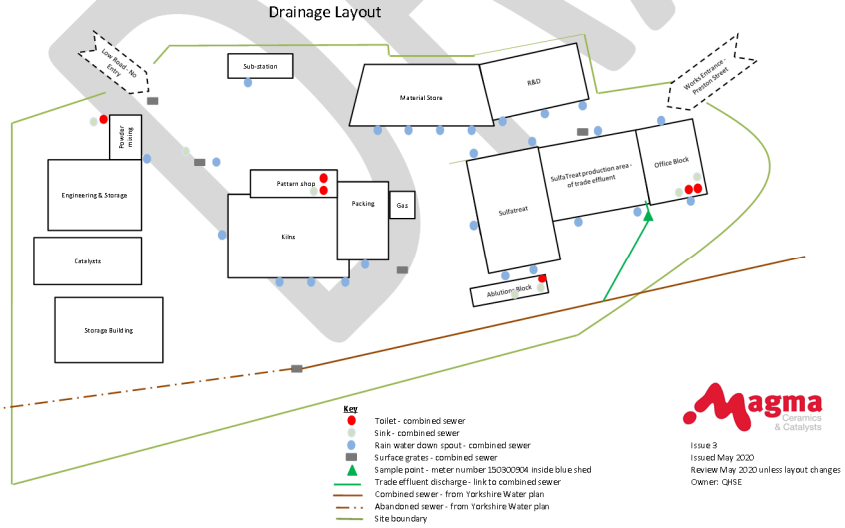
Magma is a site dedicated to the manufacture of catalysts, absorbents and adsorbents and operates on a 24/7 basis. The site itself is built on a natural occurring hillside, sloping down within a valley which although outside the boundary of the site ultimately terminates at the river Calder. There have been buildings in one form or another within the boundary of the existing site for well over 150 years. The current site buildings are predominantly erected on concrete plinths with the main driveway being of tarmacadam construction. The current buildings are all surrounded by areas of grass and vegetation leading up to the boundary fencing.

Any drainage from the site ground level is in the main via surface grates and from the roofs via flow pipes into the surface water drains and combined sewer. The more recent buildings constructed utilise drainage through natural soak away. Currently two drainage pits (catchment point) are in use which are deep enough to permeate through the dominant clay substrate. There are no extraordinary biodiversity aspects within the site boundary. All drainage components are easily maintained and have no inaccessible points. Further development plans are intending to incorporate an attenuation system and all recently built storage or manufacturing units have had their drainage pipes directed to where this system is planned to be installed.

Magma Site – Plan and access routes.

Aerial view of site.

Drainage plan (including future building works).



Simple site plan to identify drainage components

Magma SWDS Maintenance Schedule.

The below activities form part of the Engineering Management System and the data complete with frequency and any corrective actions if applicable is recorded

Monthly site inspection by own personnel as per check list below, plus the following activities (by own personnel or nominated contractor).

New Construction on Site.

Upon completion of new construction work – Flush associated drain system and note effectivity.

0-6 months – Monthly monitoring to check any settlement effects resulting in damage to system by visual inspection of associated areas and lifting covers on chambers to check levels.

12 months – Annual cleaning and adoption of normal inspection/maintenance procedure

Regular Maintenance Routines – existing and post 12-month construction/installation.

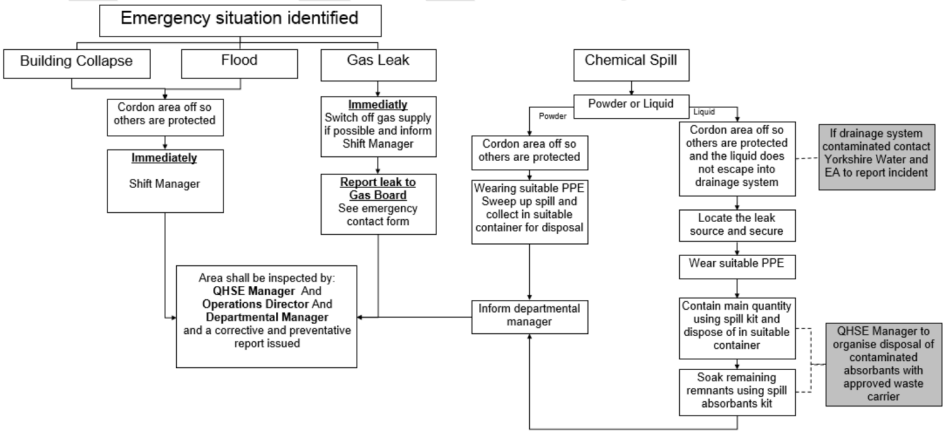
Activity.	**Frequency.**
Gutter/gulley clean for each building.	Annual (End of autumn / early winter)
Clean out of surface water yard drains.	Annual (remove any silt/debris & jet through)
Inspection of Silt traps.	Monthly
Attenuation system,	
Flush and jet tank.	In line with manufacturers guidance.
Inspect any associated silt traps.	In line with manufacturers guidance.
Inspect weir wall screens, remove debris.	In line with manufacturers guidance.

Magma Contacts & Emergency preparedness and response procedure.

Adam Swallow – QHSE Manager

Adrian Bickerdike – Engineering Manager

Dorian Hall – General Manager



Photographic records.

Photographs are taken periodically of the site in all the open areas to generate an annual comparison history. These include the car park areas, main driveway access routes, grassed / wild vegetation areas and the embankments.

Maintenance SWDS inspection/checklist

(Conducted monthly in conjunction with Mgmt. Housekeeping Tour Team).

General Inspection Items.	Inspection Date:- Y / N	Details	Action required	Date Completed
Is there any evidence of erosion, channelling, ponding (where not desirable) or other poor hydraulic performance?				
Is there any evidence of accidental spillages, oils, poor water quality, odours, nuisance insects?				
Have any health and safety risks been identified to either the public or maintenance operatives?				
Is there any deterioration in the surface of permeable or porous surfaces (e.g. rutting, spreading of blocks or signs of ponding water)?				
Silt / sediment accumulation	**Y / N**	**Details**	**Action required**	**Date Completed**
Is there any sediment accumulation at inlets or other defined accumulation zones such as the surface of filter drains?				
Is surface clogging visible?				
Does permeable or porous surfacing require sweeping to remove silt?				
System Blockages / Litter build up	**Y / N**	**Details**	**Action required**	**Date Completed**
Is there evidence of litter accumulation in the system?				
If yes, is this a blockage risk?				
Is there any evidence of any other clogging/blockage of outlets or drainage paths?				
Vegetation	**Y / N**	**Details**	**Action required**	**Date Completed**
Is the vegetation condition satisfactory (density, weed growth, coverage etc.)?				
Does any part of the system require weeding / pruning / mowing?				
Is there any evidence of invasive species becoming established? If yes, state action required.				
Infrastructure	**Y / N**	**Details**	**Action required**	**Date Completed**
Is there evidence of any accidental damage to the system areas?				
Other observations	**Y / N**	**Details**	**Action required**	**Date Completed**
Information appended (e.g. photos)				
Suitability of current maintenance regime	**Y / N**	**Details**	**Action required**	**Date Completed**
Continue as current.				
Increase maintenance.				
Decrease maintenance				