



Water Management (protecting drainage & watercourses) Guidance

Purpose

We must ensure that the water environment is protected from pollution impacts from our activities. This means understanding what water systems could be impacted and how sensitive they are, planning activities to avoid pollution risk and monitoring works to ensure controls are effective.

Permits or consents may be required from various regulators to undertake works in or near, or to discharge to, watercourses or drainage systems.

Refer to EMS standard - Pollution Prevention

This guidance is aimed at Persimmon employees involved in planning work activities or tasks in or near watercourses.

Guidance

In all cases, steps must be taken to **prevent pollution** of the water environment. Identifying the potential sources of pollution, pathways by which this can reach watercourses and the type / sensitivity of the watercourse it may reach (the 'receptor') enables planning of activities to avoid pollution.



Sources of pollution

- Sediment
- Fuel & oils
- COSHH items
- Waste

Understanding your site

A comprehensive understanding of site drainage is a key element in planning how to prevent clean water from entering site as well as how to manage silty water produced on site.

It is best practice to retain vegetation cover, minimise soil stripping and establish new vegetation on bare ground at the earliest opportunity. Erosion of soils can be caused by wind but is normally attributed to rainfall.

Identifying key areas on site that require protection is another important aspect of planning, these include:

- Haul roads and site access points
- Drains / land drains
- Existing watercourses / ditches
- Drainage channels
- Slopes (consider general topography)

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Drain Protection

Protection must be provided for all surface water drains, manholes and or gullies (whether existing or newly installed). Surface water run-off contaminated by sediment, heavy metals or oils has the potential to cause pollution which could lead to enforcement action.

Blocking drains is an option, but consideration must be given to where the water will flow, as it will ultimately enter a surface water system. Any water leaving our developments must be '**clean and uncontaminated**'.



Type of Protection Required

There are **two options** for the protection of surface water drains on site. The minimum requirement for drain protection is as per below:

Option 1

- Install gulley guard bag with geotextile terram on top
- The terram must be held in place so that it cannot fall into the gulley pot – it can be layered into the sub-base or held in place by the gulley crate





Option 2

The GulliBlok must be installed when groundworkers are installing roads and sewers, as it requires a location plate to be installed over the gully.

Refer to Water Quality & Silt Management Standard for further details.

Maintenance

- Protection measures must be regularly inspected and maintained to ensure ongoing performance – weekly minimum checks are required.
- Dependant on the location of the gully and the types of materials in the run-off from the surface areas on site, more frequent check may be required – **even daily in some instances.**
- A formal maintenance schedule must be put in place during the construction phase.



GulliBlok installed during roads & sewer works

Controlling surface water run-off

Sites must make provision to protect any vulnerable areas which could lead to a water pollution. This can be in the form of bunds, v-ditches, silt fencing etc.

Intercept water

- Surface water from neighbouring land should be **intercepted** and **prevented** from entering site through the construction of ditches and or soil bunds.



Soil bund has captured silt-laden run-off

- Create bunds (at low points) to prevent water run-off into watercourse.
- Remove existing field ditches or divert into settlement /attenuation pond.
- Create v-ditches and filter drains where necessary to intercept existing drainage to enable the controlled movement of surface water on site.



- These systems should be connected directly to an attenuation feature (further treatment of water may be required)
- Additional ditches should be cut as the project progresses to intercept surface water run-off from any areas with exposed soils and haul roads or to prevent uncontrolled run-off from site. They must be positioned so that they can remain undisturbed for as long as the work programme requires.



- Minimise ground disturbance when cutting ditches. Always work uphill of the v-ditches.
- Move all excavated material away from the ditch for reuse on the scheme. Do not place it on the edge of the ditch unless it is specifically being used as a bund or within the flow path of water.
- V-ditches must be profiled with a flat bottom and sloping banks (30o being the steepest), they must be sufficiently deep to intercept any drains and have sufficient capacity to move water by gravity





A silt fence should also be installed around the site boundary or to protect a vulnerable area from run-off. However, silt fencing cannot be relied upon entirely for effective water treatment.

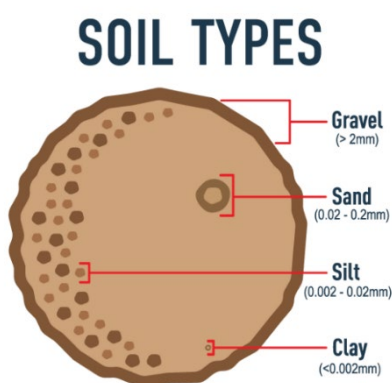
Treatment options

Any discharge of water (including run-off) from site must be 'clean and uncontaminated'. If the water is visibly discoloured / cloudy, it **must be treated** prior to discharge.

Treatment options include:

- Filtration (e.g. sediment socks, sediment mats)
- Settlement ponds / attenuation basins
- Settlement tanks (provided via Siltbuster, Kelly Tanks, RVT Group etc.)
- Flocculation (either using tanks with dosing units or placing floc-blocs in cages within ditches/manholes, and floc-mats (like sediment mat but impregnated with flocculants))

Filtration



Dependent on the type of sediment requiring filtration, provision must be made for the appropriate treatment method.

Gravel/sand- these are heavier fractions which can easily be removed via a sediment sock (see below) or similar.

Silt- settlement (pond and or tanks) and filtration will be required.

Clay/colloid- settlement, flocculants and filtration will be required.



If required to use chemical treatment methods such as flocculants, a permit from the Regulator is required. This must be applied for several months in advance of the scheme start date.



Slow the flow



Reducing the flow of water will naturally aid the settlement of sediment.

Rock checks can be used as dams in ditches and swales to reduce the speed of water and distribute the flows across the channel.

Rock checks can be positioned end on end or pyramided, the height should allow for pools to develop upstream of each check dam to support the natural deposition of sediment. It is recommended to install Floc Mat or Silt Net

under and around the check dam to prevent erosion on the upstream and downstream sides.

Examples of good silt management



V-ditch leading surface water to attenuation pond prior to settlement and treatment before discharge



Silt capture channel made from sediment mats, floc mats and silt wattles