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Construction Site Erosion and Sediment Control Inspection Protocol

The Hamilton County Soil and Water Conservation District is responsible for administering and enforcing the Earthwork Regulations for the unincorporated areas of Hamilton County. These regulations were adopted on October 1, 1993 specifically to help eliminate, or at least minimize the creation of new or aggravation of existing sensitive land areas within unincorporated Hamilton County through the control of earth disturbing activities which have an effect on the stability of hillsides and slopes and which may cause hazardous erosion, sedimentation and associated problems by means not limited to:

- Permitting development while reducing the impact to downstream flooding, streambank erosion, and sedimentation associated with development and construction activities
- Reducing damage to receiving streams which may be caused by increase in quantity and/or rate of water discharged and impairment of their capacity which may be caused by sedimentation
- Protecting the stability of sensitive slopes.

The District implements these regulations by getting involved and offering comments as early as the concept stage of these developments through Hamilton County Regional Planning to address

potential issues up front, by reviewing the plans and making sure that Best Management Practices (BMP's) are designed and incorporated to minimize erosion and sediment discharge. Our involvement continues by inspecting these sites to ensure that controls are being installed and maintained throughout the duration of the project. Details regarding the performance, specifications, installation and maintenance of these BMP's can be found on the *“Ohio Rainwater and Land Development Manual”* published by the Ohio Department of Natural Resources. This document details the District's general protocols when conducting the inspections and monitoring to ensure compliance with the Earthwork Regulations.

I SITE FAMILIARIZATION

It is very important to gain as much information beforehand about the site and the proposed project. Identifying areas of concern at the earliest possible stage can help everybody to anticipate and plan for addressing these concerns.

- Become familiar with the existing site conditions prior to the start of the project. Check the existing topography using various tools such as USGS Topographic Maps, FEMA Floodplain Maps, GIS maps and other available resources to identify important factors such as drainage patterns, existing streams and critical slopes.
- Identify current infrastructure that could play an important factor during the project including existing sewers, catch basins and storm inlets that can be impacted and the condition of roads where the construction ingress and egress occurs.
- Identify concerns on adjacent areas that can be possibly affected by the construction activities including lakes, roads, yards or homes.
- Review the approved grading and erosion control plan as it relates to the current site conditions prior to construction. Understanding how sections of the site will be brought to final grade will help in determining the most practical approach on how to implement erosion and sediment controls on particular sections of the site.

II PRE CONSTRUCTION MEETINGS

Pre construction meetings set the tone for the way the project will be handled. It is important that the developer and contractor understands the requirements of the regulations and that the regulators recognize what it is going to take to implement the required BMP or to achieve final grade on a particular portion of the site.

- Discuss the issues identified during the site familiarization and plan review process with the developer and contractor. It is always helpful to ask for the developer or contractor's feedback on factors affecting the installation of the required BMPs so that the issues will be addressed in a timely manner.

- Develop workable and practical agreements with the developer and contractor with regards to a reasonable timetable for the implementation and maintenance of erosion and sediment controls for the duration of the project. Included on these agreements should be the approach to the clearing and the installation of sediment basins at the earliest possible time.
- Document the agreements made during the site meeting. The District generally sends out a summary letter to all parties involved on the project.

III SITE INSPECTIONS

Clearing and BMP Installation

- Ensure as much as possible that the approach to clearing is done in a manner that perimeter erosion and sediment controls can be and are installed before the rest of the site is cleared. The most effective form of control during this phase is the use of the woodchips as sediment barriers due to the fact that are probably already available at the site.
- Proceed to clear areas for detention/sediment basins including borrow areas before clearing for the rest of the site. Sediment basins must be installed at the earliest possible time during the construction process.

Grading and BMP Maintenance

Stabilized Construction Entrance

- Check if the stabilized construction entrances are installed as per the locations on the approved plans.
- Verify if the construction entrance is installed correctly. Geotextile fabric must first be installed under the rocks. These will prolong the effectiveness of the practice and prevent the rocks from sinking into the soil. The length of the drive must also be adequate.
- Check for sediment being tracked into the public right of ways. Excessive sediment tracked into the roads indicates that the stabilized entrance is failing and requires maintenance.

Silt Fence/Super Silt Fence/Woodchip or Mulch Berms

Contrary to a lot of perception, silt fence works not by filtering the water but by ponding runoff so that sediment can settle out of suspension. Silt fence is generally installed along the perimeter of a disturbed area and has its limitations. Silt fence is not suitable on steep slopes or where runoff is concentrated. Silt fence also tends to get knocked down on high

traffic areas. If these situations arise, consider relying on other controls such as temporary sediment traps, stormdrain inlet protections and sediment basins.

Super silt fence and woodchips/mulch berms are alternatives to regular silt fence. Super silt fence is recommended when site conditions such as slope steepness and slope length exceed the design criteria for regular silt fence. It is made by installing a welded wire mesh and wrapping the geotextile material around it. Woodchip berms should have a 2:1 base to height ratio when installed. They hold up better than silt fence, are easier to install along the contour and is almost always readily available at a site. They are also easier to maintain and can be incorporated into the soil when grading is completed. Although super silt fence and woodchip berms last longer and are much sturdier than regular silt fence, they also have limitations and require periodic maintenance.

- Check the locations where silt fence is proposed on the approved plans and verify if the installation is within the design criteria. If the design criteria are exceeded (slope too steep, watershed too big), consider replacing with other alternatives such as super silt fence or woodchip berms. It is also prudent sometimes to just let a contractor focus activities on a problem area to achieve final grade and stabilization (seed and mulch) as soon as possible.
- Make sure that the fences/berms are installed correctly. In order to be effective, the fences must be installed along the contour, the bottom of the fence must be trenched into the ground 8-10" and that the ends of the fence are turned upslope.
- Verify the condition of the silt/super silt fences or woodchip berms in terms of accumulated sediment. As a rule, these controls must be maintained if the accumulated sediment has reached ½ of the effective height of the berm/fence.

Temporary Sediment Traps

Sediment traps are temporary settling ponds having a simple spillway outlet structure stabilized with geotextile and riprap. This type of control is effective on areas where concentrated flow occur and therefore not suitable for silt fence. They can be built by installing a temporary dam or through excavation. It is important to take note that the volume of the trap does not exceed the capability of the temporary dam otherwise failure might occur. Excavated sediment traps must also be installed away from high traffic areas for safety reasons as accumulated water disguises the depth of the excavation.

- Check if the size of the sediment trap is in line with the size of the drainage area. Sizing and slope references can be obtained from the ODNR Rainwater and Land Development Manual.
- Check the overflow of the trap. The overflow must be protected in a way as to convey the discharge without causing additional erosion.

- Check the amount of accumulated sediment in the trap. The trap must be maintained if the accumulated sediment is up to ½ of the pond's total depth.
- Check for stagnant water during the summer months, as this could become possible breeding grounds for mosquitoes and a source of complaints from adjacent residents.

Detention/Sediment Basins

Stormwater detention basins can be retrofitted with a slow release device/riser pipe and made to function as a sediment basin. Unlike temporary sediment traps, detention basins are permanent and their locations are indicated on the approved grading plans. While these basins are designed to handle stormwater runoff, they can be efficient sediment traps due to their locations. The District, with approval from the Public Works Department, has utilized these detention basins as sediment basins during construction.

- Ensure that stormwater detention basins that will function as temporary sediment basins are installed and retrofitted with the slow release device at the earliest possible time before mass clearing and grading activities begin at the site. The basin and its surrounding area must also be seeded.
- Check the installation of the slow release device. To ensure better efficiency, the perforated riser pipe must be first wrapped with welded wire mesh/chicken wire before wrapping with geotextile material.
- Check the operation and performance of the basin and the slow release device to ensure that the basin is ponding the runoff and that it is dewatering at an acceptable rate. Clogging of the slow release device can cause the water to remain stagnant in the basin for an extended period of time. This situation requires that the slow release device needs to be maintained.
- The entire basin must be maintained once the accumulated sediment has reached 40% of the basin capacity (volume). The accumulated sediment must be removed and placed in a stable area and that the riser pipe/slow release device must be re-established. To make the determination of this maintenance point easier, the elevation for the 40% basin capacity should be staked in the basin or marked on the release structure.

Temporary/Permanent Seeding

- As a rule, all areas that are to remain idle for 21 days or longer must be stabilized.
- All critical slopes on the site must be final graded and seeded as soon as possible.
- All areas not draining to a functioning sediment basin must be final graded and seeded within 7 days of achieving final grade.

- Areas within 50 feet of a stream must be stabilized within 2 days of achieving final grade.
- All areas outside of proposed roadways and utilities must be seeded within 7 days of achieving final grade.
- As a guide, temporary stabilization must be applied on an area within 7 days of the last activity if the area is to remain idle for 21 days but no longer than 1 year. Temporary stabilization can be in the form of seed and mulch application, mulching and crimping or the installation of a mulch blanket over the entire idle area. Permanent stabilization must be applied within 7 days of the last disturbance if the area is to remain idle for 21 days and longer than 1 year.

IV DOCUMENTATION

Enforcement Official/Inspector

The inspector is a vital component to the success and implementation of a stormwater pollution prevention and erosion and sediment control ordinance. There is an element of an inspector's judgment that plays an important role in assessing a site's compliance level and the timeliness of the implementation of the necessary erosion and sediment control BMPs. Non-compliance can result in litigation and fines levied not only to a developer but also to a political jurisdiction. Due to these concerns, it is necessary to have proper documentation of all relevant proceedings for a particular site.

- The site must have all the necessary permits secured and approved before any work begins. These permits include the Ohio EPA NPDES Permit, US Army Corps permits for work on designated streams and all other permits that the local jurisdiction requires.
- All inspections must be documented through an inspection report detailing site conditions, status of the required BMPs and all other issues at the site that need to be addressed. These reports must be kept in an organized location along with the approved plans, copy of permits and contacts for the particular site.
- Photo document the site as much as possible. If possible, take photos of the site before construction, during clearing, and during construction. Also take pictures to photo document the installation or non-installation of the required BMPs, the condition of the required and installed BMPs and the BMPs requiring maintenance. It is also useful to photo record the outflow of pipes discharging runoff from the site and the conditions of existing creeks that receive runoff from the site especially during a rain event. These photos must also be kept in an organized manner.

- All correspondence detailing site meetings and orders/requests for installation and maintenance of BMPS must be kept. Letters from developers and engineers must also be maintained as part of the file for a particular project.
- Complaints regarding a project must also be documented including all the actions that the enforcing official has taken in response to the complaint.
- Phone calls and site conversations/meetings that are part of the compliance process must also be documented.
- It is important to note that these documents are a matter of public record and should be treated as such.

Developer/contractor

The Ohio EPA NPDES Permit for construction sites requires the developer and contractor to actively monitor their sites by doing the following activities. These requirements are incorporated into the Hamilton County Earthwork Regulations and should be included within the regulations of local jurisdictions.

- The developer must inspect all erosion and sediment controls once every 7 days and within 24 hours after each rainfall of ½ inch or greater.
- The developer must conduct necessary repairs within 72 hours.
- The developer must maintain a record of these inspections and maintenance for the duration of the project. These records must be made available to the enforcing official upon request.

V SITE MEETINGS

Site meetings shall be scheduled regularly. They are helpful in establishing rapport between the developer, contractor and the enforcing official. It is also an opportunity for everybody to see the site and the particular areas of concern that require attention. It is also a way of emphasizing critical issues that require resolution and the enforcing official's requirements to keep a site in compliance. A follow up letter summarizing all points of discussion and agreements made during a site meeting should be sent to all parties involved.