County of Lake

Stormwater Management Department

125 East Erie Street
Painesville, OH 44077

Phone: (440) 350-5900
Fax: (440) 350-5919

www.lakecountyohio.org/smd

Lake County

Stormwater Pollution Prevention Plan

Guidance Manual

Lake County Soil & Water Conservation District

125 East Erie Street
Painesville, OH 44077

Phone: (440) 350-2730
Fax: (440) 350-2601

www.lakecountyohio.org/soil

Chapter
1

Stormwater Pollution Prevention Plan (SWP^3)

General

Background

This guidance manual has been created to provide Engineers with a tool to assist with the creation of Stormwater Pollution Prevention Plans (SWP^3s) for grading and construction sites. SWP^3s are required to be provided to the Lake County Stormwater Management Department (LCSMD) and/or the Lake County Soil and Water Conservation District (LCSWCD) prior to project approval or construction activity. This manual discusses what issues will be reviewed by LCSMD and LCSWCD and provides guidance as to how to meet those requirements. The information provided in this manual has been compiled from the Ohio EPA General Construction Permit No. OHC00002 (effective April 21, 2003 to April 20, 2008). More information on how to meet the conditions of the permit can be found in the latest edition of the Ohio Rainwater and Land Development, Ohio's Standard for Stormwater Management, Land Development and Urban Stream Protection manual.

> The Ohio EPA General Construction Permit can be found at http://www.epa.state.oh.us/dsw/permits/final_constr_GP.html

The manual provides design guidance for any site disturbing one acre or greater. For the designer's convenience, a CD has also been provided at the end of this document with an assortment of detail drawings and general notes that can be used on design plans.

A Notice of Intent (NOI) must be submitted to Ohio EPA 21 days prior to the commencement of any construction activity (NOI included in Appendix A). An approved SWP^3, the NOI, and the letter from the Ohio EPA director granting permit coverage must be immediately available on-site during working hours. The SWP^3 must be amended whenever there is a change in design, construction, operation, or maintenance which affects the potential for the discharge of pollutants or the SWP^3 proves to be ineffective.

A CD has been provided in Appendix G that contains sample general notes for inclusion on plans.

Important Note: The development of a SWP^3 for the LCSMD does not relieve the owner/applicant from the responsibility to obtain all other necessary permits or approvals from Federal, State, County or local agencies.

Chapter
2

SWP^3

Accompanying Documentation

Background

Operations that disturb more than one acre of land, or that are part of a larger common plan of development such as residential or commercial subdivisions, are required to submit a SWP^3. The SWP^3 must include a detailed site description.

Site Description Narrative

The following items must be included in the narrative related to the site description.

1. The nature and type of construction activity (ex. low density residential, commercial, industrial, roadway, utility, etc.).

2. Description of the total area of the site that will be disturbed during construction. This includes areas located off-site, such as borrow and fill areas.

3. Calculations for the pre-construction and post-construction runoff coefficients. These runoff coefficients must be calculated using the following table.

Land Use	Runoff Coefficient
Industrial & Commercial	0.8
High Density Residential (>8 dwellings/acre)	0.5
Medium Density Residential (4 to 8 dwellings/acre)	0.4
Low Industry Residential (<4 dwellings/acre)	0.3
Open Space and Recreational Areas	0.2

- Table 1. OEPA Permit OHC000002, Part III.G.2.e

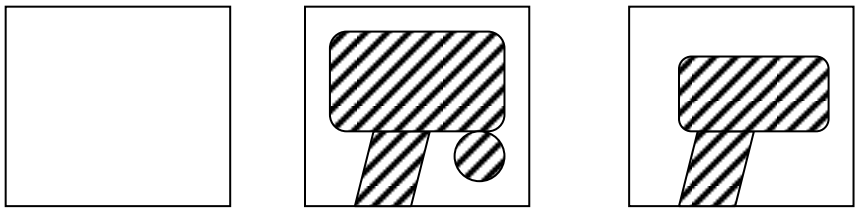
A weighted average must be calculated for mixed land uses.

Example: Site has 60% low density residential, 30% high density residential and 10% open space.

Calculation: (0.6) (0.3) + (0.3) (0.5) + (0.1) (0.2) = 0.35

4. An estimate of the percentage of the site that was impervious before construction and percentage after construction is complete.

   Example:



Pre-construction – o% impervious | During construction – 80% impervious | After construction – 50% impervious

During construction, all cleared and graded areas are considered impervious.

5. A description of the soils on the property.

6. Report on any prior water quality monitoring completed at the site.

7. Information about prior land uses at the site.

8. An implementation schedule for the sequence of all major construction activities and the implementation of erosion, sediment and stormwater management practices or facilities as they relate to each major construction activity. This information should be very specific, including step by step instruction. If more than one contractor is responsible to complete activities, then the task of each contractor should be specified.

   Example:

   <u>Sequence of Construction:</u>

   a. Clear – Contractor A
   b. Install sediment traps – Contractor A
   c. Grub – Contractor B
   d. Adjust sediment traps if topography has been altered – Contractor B
   e. Etc.

   More detailed examples can be found in Appendix B.

9. Name(s) and location(s) of all receiving streams. This can be a verbal description, but a map would also be acceptable.

   Example:

   Unnamed tributary (0.1 mi) – Red Creek (0.5 mi) – Grand River (1.2 mi) – Lake Erie (0.4 mi) (distances to confluence)

10. A description of all wetlands or other special aquatic sites which will be disturbed and/or are a receiving water for site runoff. A map of the wetland boundary should also be included.

11. The location and description of stormwater discharges associated with dedicated asphalt and/or concrete batch plants covered by the NPDES Construction Stormwater General Permit. Best management practices (BMP) are required to be specified for the plants associated with road projects.

12. Descriptive and technical documentation to support the selection of particular post-construction BMPs. See Chapter 5 for a more detailed description of these requirements.

13. A copy of the NPDES Construction Stormwater General Permit.

A fill-in-the-blank type form is included in Appendix C that, if filled out properly, will assist designers meet the Site Description provision of the General Construction Permit.

Chapter
3

SWP^3

Site Plan Requirements

Background

The General Construction Permit requires that several specific components be shown on the detailed site plan for proposed projects. The SWP^3 cannot be approved unless these items are shown, or there is a compelling reason why they are not. A detailed explanation as to why something has been excluded must be included in the SWP^3 or the plans cannot be approved by LCSMD.

Detailed Site Plan Requirements

The detailed site plan for the proposed project must include several items to conform to the Ohio EPA General Construction Permit. These items include:

1. Limits of earth-disturbing activity including an associated off-site areas (ex. borrow or spill areas).

2. Soils types for all areas of the site. Special attention should be given to unstable or highly erodible soils.

3. Existing and proposed contours.

4. Existing and proposed drainage watersheds including the size of each watershed in acres (this is for the full drainage area, not just the site).

5. Surface water locations including springs, wetlands, streams, lakes, water wells, etc. on or within 200 feet of the site.

6. Boundaries for wetlands or stream channels and first subsequent named receiving water(s) that the project intends to fill or relocate (must seek approval from Army Corps of Engineers and/or Ohio EPA for this).

7. Existing and proposed buildings, roads, parking facilities, and utilities.

8. Location of all erosion and sediment control practices, including the location of areas likely to require temporary stabilization during the course of site development.

9. Location of sediment and stormwater management basins noting their settling volume and contributing drainage area (during construction and after).

10. Location of permanent stormwater management practices to be used to control pollutants in stormwater after construction operations have been completed.

11. Areas designated for the storage or disposal of solid, sanitary, and toxic wastes (including dumpsters areas)

12. Areas designated for concrete truck washout

13. Areas designated for vehicle fueling.

14. Location of designated construction entrances where the vehicles will enter and exit the construction site. This is not required on a linear project. A detail for the construction of the entrance must be included.

15. Location of any in-stream activities including stream crossings.

16. Detailed drawings of a typical individual lot with sediment and erosion controls for projects without centralized sediment controls (ex. residential sublot of a subdivision).

17. Detail drawings for all sediment control devices.

Chapter
4

SWP^3

Erosion and Sediment Control

Background

It is important to make use of practices that preserve the existing natural condition of the site as much as feasible. Proper sediment and erosion controls can significantly reduce the impact of construction on the natural environment.

Land Disturbance

Every effort must be made to minimize the amount of land disturbed on the site both during construction and after. If land disturbance is necessary, then construction should be phased to minimize the amount disturbed at any one time.

> ***Standard Notes (to be included on plan)***
>
> *Limits to clearing and grading shall be marked clearly on site before any grubbing or earth disturbing activity shall begin.*

Erosion Control

SWP^3 plans for development should be designed to minimize erosion. Erosion control generally requires a change in how a construction site is managed. For example, the practice of temporary seeding and mulching will typically be done several times during the course of construction. Temporary seeding & mulching may be disturbed several times during construction and replacement applications will be required. Erosion control is the most cost effective and efficient way to reduce sediment pollution. Permanent seeding and stabilization is required at the completion of construction activity.

The following tables outline the required stabilization for disturbed areas.

Temporary Stabilization	
Area	**Time Frame**
Any disturbed areas within 50 ft. of a stream, not at final grade	Within 2 days of the most recent disturbance if the area will remain idle for more than 21 days
For all construction activities, any disturbed areas that will be dormant for more than 21 days but less than one year	Within 7 days of the most recent disturbance within the area. For residential subdivisions, disturbed areas must be stabilized at least 7 days prior to transfer of permit coverage for the individual lot(s).
Disturbed areas that will be idle over winter	Prior to Nov. 1
Where vegetative stabilization techniques may cause structural instability or are otherwise unobtainable, alternative stabilization techniques must be employed.	

- Table 2. Ohio EPA Permit No. OHC000002, Part III.G.b.i

Permanent Stabilization	
Area	**Time Frame**
Any areas that will lie dormant for one year or more	Within 7 days of the most recent disturbance
Any areas within 50 ft. of a stream and at final grade	Within 2 days of reaching final grade
Any other areas at final grade	Within 7 days of reaching final grade within that area

- Table 1. Ohio EPA Permit No. OHC000002, Part III.G.b.i

There are several options for restabilizing areas in between construction operations. These include:

- Mulching (straw)
- Matting (jute, excelsior, or other rolled erosion control products)
- Sodding
- Temporary seeding

A more detailed description and specifications for these options can be found in the latest edition of the “Rainwater and Land Development” manual, prepared by ODNR.

Important Note: Whatever type of stabilization method is employed, time of year is a factor that must be considered.

See temporary/permanent seeding specification table below.

Standard Temporary/Permanent Seeding Specification (to be included on plan)

Seeding Dates	Species Mixes	Lbs./1,000 ft.^{2}	Per Acre
March 1 to August 15	Oats,	3	128 lb.
	Tall Fescue, and	1	40 lb.
	Annual Ryegrass	1	40 lb.
	Perennial Ryegrass,	1	40 lb.
	Tall Fescue, and	1	40 lb.
	Annual Ryegrass	1	40 lb.
August 16 to November 1	Rye,	3	112 lb.
	Tall Fescue, and	1	40 lb.
	Annual Ryegrass	1	40 lb.
	Wheat ,	3	120 lb.
	Tall Fescue, and	1	40 lb.
	Annual Ryegrass	1	40 lb.
	Perennial Ryegrass,	1	40 lb.
	Tall Fescue, and	1	40 lb.
	Annual Ryegrass	1	40 lb.
November 1 to Spring Seeding	Use mulch only, Sodding practices, or dormant seeding		
Note: other approved seed species may be substituted			

Table from ODNR Rainwater and Land Development Manual

Standard Notes (to be included on plan)

Disturbed areas that will remain inactive for a period of twenty-one (21) days or longer shall be stabilized with seeding and mulching, or other appropriate means, within seven (7) days after earth moving ceases. Permanent soils stabilization shall be installed within seven (7) days after final grade is reached on any portion of the site.

Stabilize areas within fifty (50) feet of any stream or wetland within two (2) days on all inactive disturbed areas that will remain inactive for fourteen (14) days or longer.

All sediment ponds, sediment traps, earthen diversions or embankments shall be seeded and mulched within seven (7) days of completed construction.

Seeded areas shall be inspected and where the seed has not produced 80% cover shall be reseeded as necessary by the contractor. Areas shall be stabilized with mulch when conditions prohibit seeding.

Straw mulching shall be applied at a rate of 2-3 standard 45-lb. bales per 1000 sq.ft. of disturbed area or two (2) tons per acre. All hydroseeding must be straw mulched according to the above specifications unless it is watered weekly.

Runoff Control

Runoff must be controlled from disturbed areas to prevent erosion from occurring. Practices to control the runoff can include:

- Rock check dams (reduce flow velocities)
- Diversions to direct flow away from exposed soils
- Protective grading practices (tracking, stair-step grading, grooving)
- Pipe slope drains (divert concentrated flow)

These practices should be implemented to direct runoff away from disturbed areas and protect steep slopes where possible.

Specific design guidance for the runoff control practices listed above can be found in the latest edition of the “Rainwater and Land Development” manual, prepared by ODNR.

Sediment Control

Sediment control devices must be constructed for all areas on the site that will remain disturbed for over 14 days. Consideration must be given to how much acreage will be disturbed when the controls are selected.

Options for sediment control include:

- Sediment settling ponds and sediment traps
- Silt fences (sheet erosion only)

- Earth diversion dikes or channels which direct runoff to a sediment settling pond or vegetated settling area
- Storm drain inlet protection

All sediment controls must be capable of ponding runoff in order to be considered functional. Earth diversion dikes or channels alone are not considered a sediment control practice unless they are used in conjunction with a sediment settling pond or settling area.

Detailed drawings of all sediment control devices are to be included on the plans.

It is important to remember that sediment controls must be installed within 7 days of clearing/grubbing activities. Also, as the site develops, consideration must be given to changing slopes and topography and provisions must be made to ensure the proper operation of the sediment control devices over all phases of the project.

Sediment Settling Ponds

If it is found that the concentrated runoff from the site will exceed the design capacity of a silt fence or inlet protection, a sediment settling pond must be used. A sediment settling pond is also required for any site with greater than 10 acres of disturbance. Sites with less than 10 acres of disturbed area can construct smaller sediment basins or traps.

If the designer proposes to use an alternate method when a sediment settling pond is required, they must request approval from Ohio EPA and LCSMD. In order to receive approval the alternate method must be shown to be equivalent in effectiveness.

Pond specifications:

Item	Details
Size	Greater than or equal to 67 yd^3 (0.04 ac.-ft.) of storage per acre of total contributing drainage area
Depth	Less than or equal to 5 ft.
Configuration of inlet to outlet	>2:1 length to width (see Fig. 1)

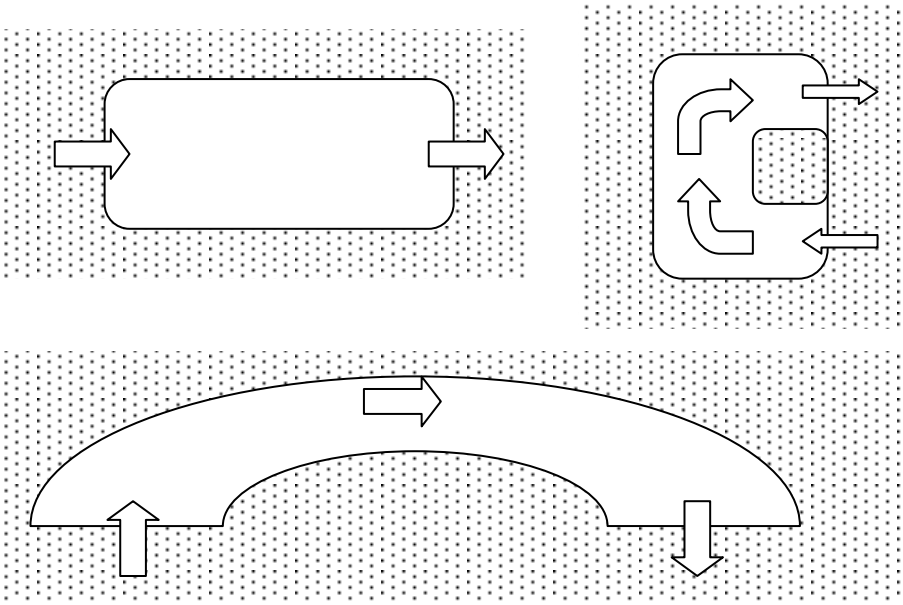


Figure 1. Flow Routing Example

Inlet to outlet design must ensure that short circuiting is prevented.

Sediment must be removed from the pond when sediment reduces the design volume by 40%. This is typically when the sediment depth is half the basin depth.

Public safety must be considered when designing a sediment settling pond, especially as it relates to children. Alternate sediment controls must be used where the site limits a safe design.

Silt Fence / Diversions

Sheet flow from denuded areas must be intercepted by silt fences or diversions to protect adjacent property and watercourses from sediment transport.

Silt fences are only to be used for sheet flow situations and must be constructed on the level contour. The maximum drainage area allowed behind the silt fence for a particular slope is detailed below:

Maximum Drainage Area to 100 Linear Feet of Silt Fence (in acres)	Range of Slope for a Particular Drainage Area (in percent)
0.5	<2
0.25	≥2 but <20
0.125	≥20 but <50

Runoff diversions must be used to keep runoff away from disturbed areas and steep slopes, where practical. Diversions structures can include:

- Grassed Swales,
- Grassed Dikes or Berms.

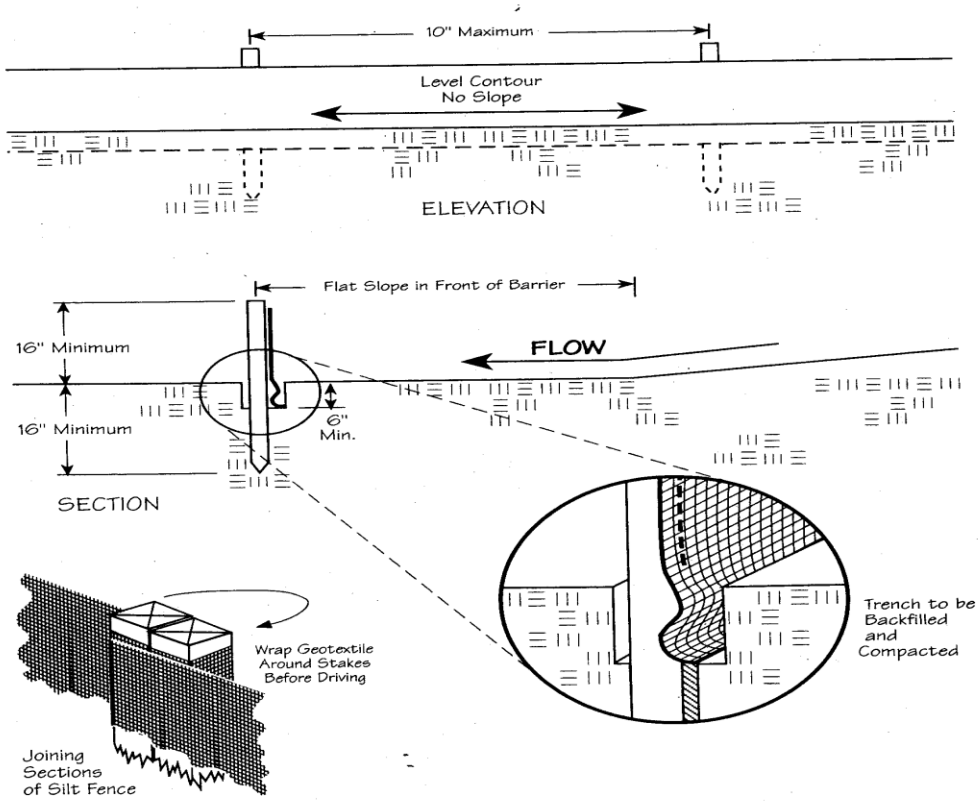
These devices may only be used for areas that receive stormwater from less than 10 acres.

Where any of the above criteria are exceeded, a diversion directing runoff to a sediment- settling pond is required.

More detailed design information for silt fences and diversions can be found in the latest edition of the ODNR Rainwater and Land Development Manual.

Standard Detail (to be listed with installation and maintenance specifications)

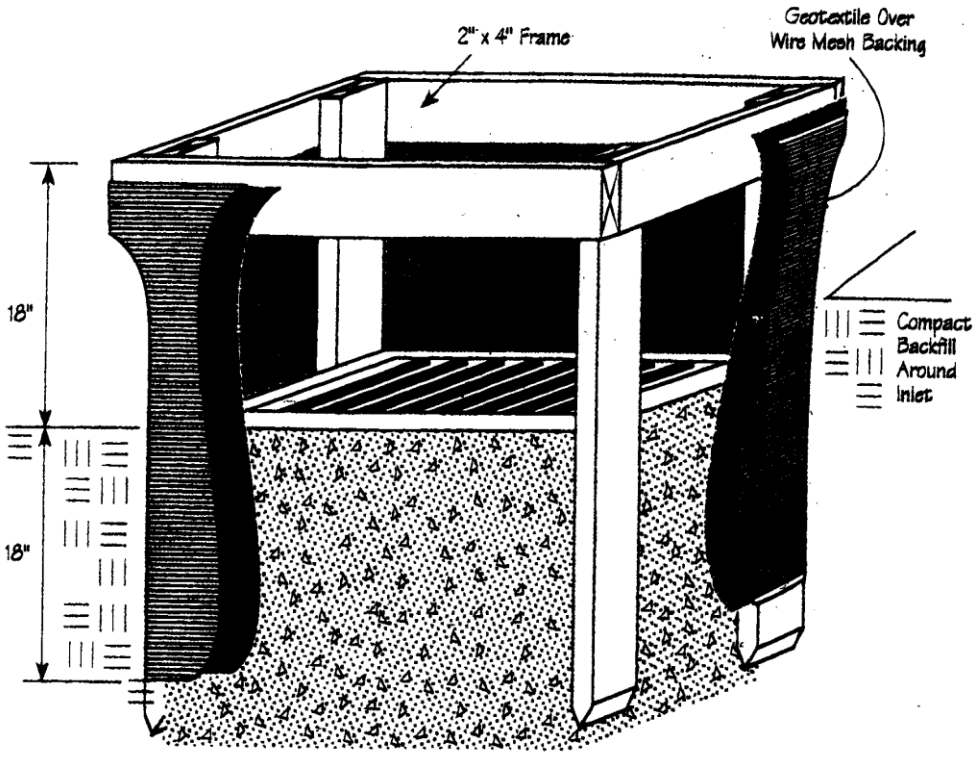
Specifications
for
Silt Fence



Inlet Protection

Flow of sediment-laden water into an active storm drain system must be minimized, unless the storm drain system drains to a sediment-settling pond. If a structural practice such as curb inlet protection is not used, then it is important that another program be maintained. There are several non-structural options which may be employed for protecting the drainage system including silt fences across lot frontage, prompt seeding and mulching, street cleaning, and on-lot construction entrances.

Standard Detail (to be listed with installation and maintenance specifications)



Stream Protection

The natural riparian setback adjacent to streams or other surface waters should be preserved during and after construction. Recommended riparian setback standards are as follows:

Square Mileage of Watershed	Buffer Size on either side of stream
0 – 2.5 miles^2	25 ft.
2.5 – 5 miles^2	40 ft.
5 – 10 miles^2	50 ft.
10 – 20 miles^2	75 ft.
20 – 50 miles^2	100 ft.
> 50 miles^2	120 .ft

- Table 1. Lake County, Ohio Subdivision Regulations, p. 33

If construction activities disturb areas adjacent to streams, structural controls must be designed to protect the stream from the impacts of sediment-laden runoff. These structural controls shall not be installed in-stream.

A minimum 25-foot setback from the watercourse's floodway or ordinary high water mark of the watercourse is recommended to maintain a natural permanent buffer. In places that impacts within the buffer area are unavoidable due to the nature of the construction activities (i.e. utility crossings), the number of stream crossings and the width of the disturbance must be minimized.

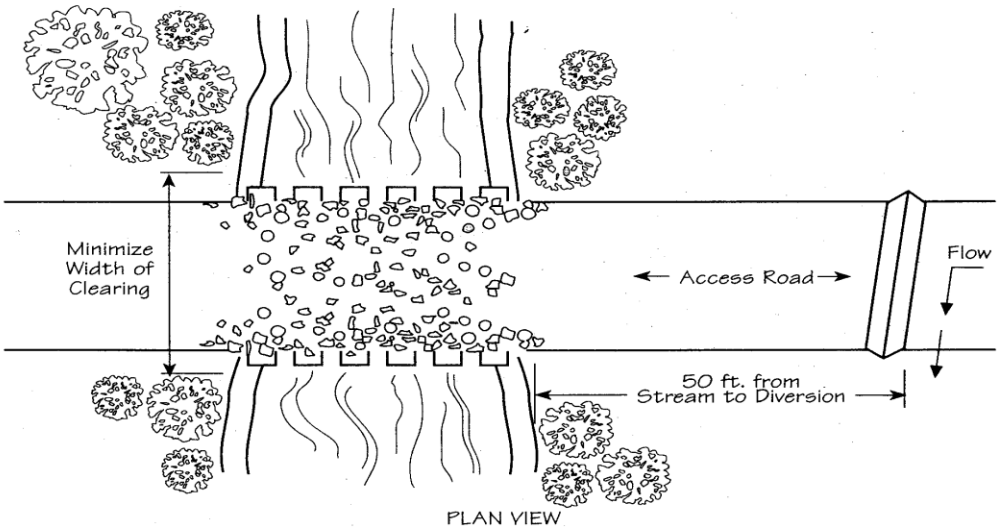
Important Note: Seeding and mulching within 50 feet of the stream shall occur within two days if these areas are to remain inactive for fourteen days or longer.

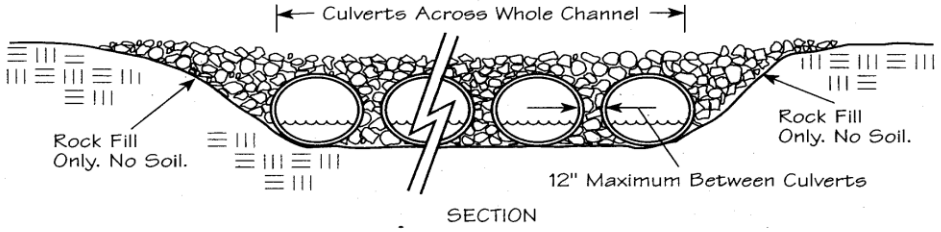
Stream Crossings

Culverted stream crossings are to be constructed entirely of stone, rock, or clean recycled concrete- never soil. They are to be constructed in a way that minimizes the disturbance of a bed and bank of the stream as much as possible. Existing stream bank vegetation shall be preserved to the maximum extent practical and the crossing shall be as narrow as practical.

Standard Detail (to be listed with installation and maintenance specifications)

Specifications
for
Culvert Stream Crossing





Standard Notes (to be included on plan)

Sediment control shall be accomplished by seeding and mulching all disturbed areas immediately upon completion of excavation or fill and finish grading in accordance with specifications of the ODNR Rainwater and Land Development Manual.

Sediment ponds, sediment traps, and perimeter sediment controls, shall be implemented as the first step of grading and within seven (7) days from the start of grubbing. They shall continue to function until disturbed areas are re-established with temporary vegetation. No sediment controls shall be placed in a stream.

All sediment ponds, sediment traps, earthen diversions or embankments shall be seeded and mulched within seven (7) days of completed construction.

Stabilize areas within fifty (50) feet of any stream or wetland within two (2) days on all inactive disturbed areas that will remain inactive for fourteen (14) days or longer.

Stream crossings shall be constructed entirely of stone, rock, or clean recycled concrete. Soil or earthen material may not be used. A twenty-foot (20) stone apron on either side of the stream shall be constructed to prevent localized sedimentation. All disturbed areas of the bank within fifty (50) feet of the stream shall be stabilized with seed and mulch within 2 days of the disturbance.

Trench Dewatering and Groundwater Controls

Sediment laden water that is removed from trenches or other facilities is to be directed to a sediment-settling pond or other equally effective sediment control device. Alternatively, the sediment can be removed by settling in place, dewatering into a sump pit, filter bag or a comparable practice.

Groundwater dewatering which does not contain sediment or other pollutants does not require treatment prior to discharge although a non-erosive channel must be provided for it's conveyance.

Dewatering activities shall not cause turbid discharges to surface waters.

Important Note: At no time can an untreated discharge from a basement, footer drain, trench, borrow pit, or any other sediment laden depression be pumped directly onto the street or into a storm sewer inlet.

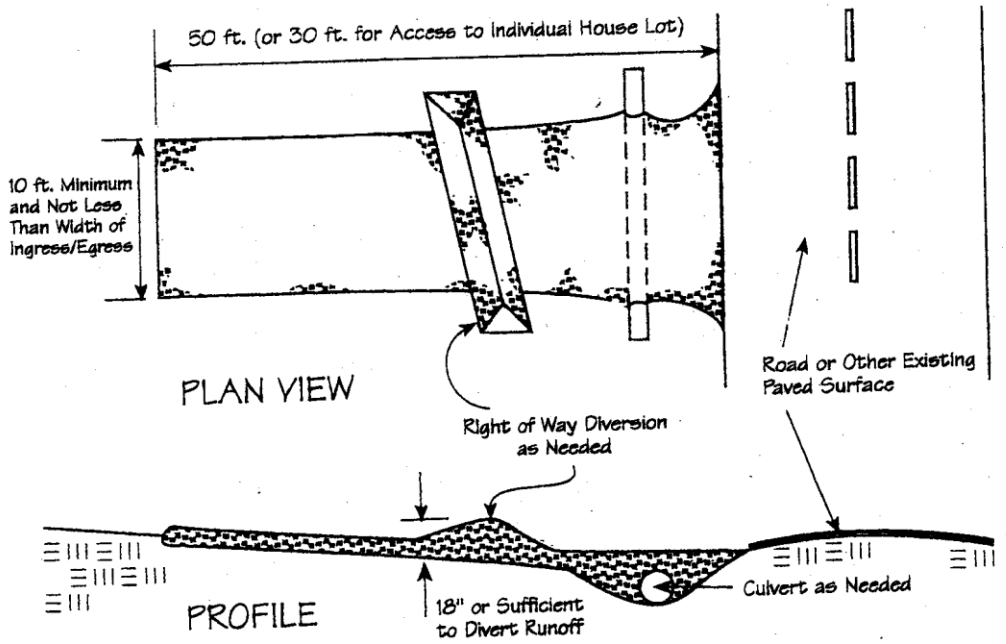
Standard Notes (to be included on plan)

Trench dewatering or ground water, which contains sediment shall pass through a sediment- settling pond or equally effective sediment control device. Alternatives may include dewatering into sump pit, filter bag or existing vegetated upslope area. Sediment laden water shall not be discharged to streams or the storm sewer system.

Site Traffic

Sediment and dust generation from vehicle traffic must be minimized. Construction entrances shall be utilized by all contractor traffic and maintained throughout construction.

Standard Detail (to be listed with installation and maintenance specifications)



> ***Standard Notes (to be included on plan)***
>
> *Construction entrances shall be installed at all ingress and egress locations to eliminate off-site vehicle tracking of sediments. Sediments shall be removed from roadways daily.*

Inspections

The contractor is responsible to have qualified inspection personnel conduct an inspection of the site every seven days, at a minimum. Additionally, inspections are required within 24 hours of a storm event greater than 0.5 inches of rain per 24-hour period. All disturbed areas, material storage areas, erosion and sediment control devices/measures, discharge locations and vehicle access points must be inspected and deemed to be operating properly.

> ***Standard Notes (to be included on plan)***
>
> *The contractor shall be responsible for erosion control maintenance and inspections on a weekly basis and after all rain events producing ½" of rain per 24 hours. A written record documenting the results of these inspections must be created and maintained with the SWP3.*

Maintenance

Controls must be repaired or maintained to ensure continued performance of their intended function. They must remain functional until all upslope areas are permanently stabilized. Sediment control structures must be repaired or properly maintained within 7 days of a failed inspection. All other controls must be repaired or properly maintained within 3 days of a failed inspection or when needed.

> ***Standard Notes (to be included on plan)***
>
> *Contractor shall comply with the maintenance schedule included in the approved plans for the proposed erosion controls. A written document containing the signatures of all contractors and sub-contractors involved in the implementation of the SWP3 must be maintained as proof acknowledging that they reviewed and understand the conditions and responsibilities of the SWP3.*
>
> *Additional erosion control BM's may be mandated by the governing agency.*

Single Lot Erosion and Sediment Control Requirements

The site plans for individual lots must show erosion and sediment controls including accompanying erosion control notes. Each site plan must reflect existing and proposed topography and building conditions and have the erosion and sediment controls designed to reflect that. Each individual site plan is also required to have labeled topography (at 1-foot intervals), street names, sublot numbers, the subdivision name, and date. The following BMPs are required to be shown on the site plans for a single lot:

- Stoned construction entrance underlain with the appropriate geotextile
- Temporary seeding and mulching of all disturbed areas (first 30' from street) and stormwater facilities within the rights-of-way
- Storm sewer inlet protection for rear yard drains and catch basins
- Temporary seeding within 50 feet of any stream or wetland
- Silt fencing (where necessary)
- Concrete washout basin

A sample single lot site plan has been included in Appendix D. Standards and specifications for these practices can be found in the latest edition of the ODNR Rainwater and Land Development Manual.

Chapter
5

SWP^3

Post Construction Stormwater Management

Background

Post-construction stormwater management practices are to protect stormwater runoff quality and quantity. This in turn will protect the physical, chemical and biological characteristics of the receiving stream. The SWP^3 is to contain a description of the post-construction best management practices (BMPs) as well as the rationale for their selection. The rationale must include possible impacts on the morphology, hydrology and water quality of the receiving stream.

Exclusions

Linear construction projects (ex. Pipeline or utility installation) which do not result in the construction of an impervious surface are not required to include post-construction BMPs in their SWP^3. However, linear projects must be designed to minimize stream crossings and the width of disturbance.

Public entities (ie. state, counties, villages, cities, or townships) are excluded from post-construction BMP compliance for **roadway projects initiated before March 10, 2006 (**see ODOT supplemental specification 832 and 833).

Post-Construction BMPs

Post-construction BMPs are required for all construction projects disturbing more than one acre (except for the exclusion noted above). Longterm maintenance plans must be provided to the site operator once construction of structural BMPs has been completed. A copy of the Maintenance Plan must be submitted to LCSMD prior to completion of construction and operation of stormwater management facilities (see Appendix E for a sample plan). It is also suggested that a contract be completed for proper operation of those facilities.

Design guidance has been broken into two categories. Small construction sites are considered sites that will disturb between 1 and 5 acres of land that are not part of a larger common plan. Large construction sites are those disturbing 5 acres or more or that are part of a larger common plan of development such as subdivisions.

Small Construction Activities (1 to 5 acres of disturbance)

On small construction sites, measures must be included in the design to control pollutants in stormwater discharges after construction is complete. All structural measures should be placed on upland slopes, if possible.

Structural BMPs that may be used include but are not limited to:

- Stormwater detention structures
- Stormwater retention structures
- Open vegetated swales and natural swales for flow attenuation
- Infiltration of runoff onsite
- A combination of several practices that control pollutants

The SWP^3 must include an explanation of the technical basis used to select the BMP where flows exceed pre-development levels.

Non-structural BMPs may also be used (ex. Signage, stenciling, etc.), but the SWP^3 must include a detailed description of what will be used and why.

Designers must be aware that the selected BMP(s) must be site specific. For example, a gas station must have an oil/water separator installed.

Whichever method of post-construction BMP is selected, velocity dissipation devices must be placed at discharge locations and along the length of any outfall channel. These devices are required to limit erosion in the existing watercourse and ensure that there are no significant changes to the receiving water hydrology.

Large Construction Sites (≥ 5 acres disturbance)

Post-construction BMP(s) are required for all construction sites that will disturb five or more acres of land in order to detain stormwater runoff for the protection of the stream channel, for erosion control and improved water quality. The selected BMP(s) must be a permanent structural part of the site drainage system, must be sized to treat the water quality volume (WQ_v), and must comply with Ohio's Water Quality Standards in OAC Chapter 3745-1. Consideration must also be given to flood control volume.

There are two methods that can be used to calculate the WQ_v:

1. Through a site-specific hydrologic study. The local long-term hourly precipitation records must be used.

2. Using the following equation:

$WQ_v = C * P * A/12$

Where:

WQ_v = water quality volume in acre-feet
C = runoff coefficient (see Table below)
P = 0.75 inches of precipitation depth
A = area draining into BMP in acres (includes offsite area)

Land Use	Runoff Coefficient
Industrial & Commercial	0.8
High Density Residential (>8 dwellings/acre)	0.5
Medium Density Residential (4 to 8 dwellings/acre)	0.4
Low Industry Residential (<4 dwellings/acre)	0.3
Open Space and Recreational Areas	0.2

- Table 1. OEPA Permit OHC000002, Part III.G.2.e

If a site has mixed uses, it is important to ensure that the runoff coefficient is calculated properly. A weighted average of the above runoff coefficients must be used.

For example:

20% of the site is commercial
60% of the site is high density residential
20% of the site is open space

Runoff Coeff. (total) = (%/100)*C1+ (%/100)*C2+(%/100)*C3+ etc

$C_T = (0.20)(0.8) + (0.60)(0.5) + (0.20)(0.2)$

$C_T = 0.5$

There are several structural BMPs that can be used to provide post-construction stormwater management. These include:

- Water quality ponds
- Infiltration trench

- Sand filter
- Grass filter
- Bioretention area

Detailed design guidance can be found in the latest edition of the "Land Development and Rainwater Manual" produced by ODNR. It should be noted that if the structural BMP selected will be used for sediment storage and/or has reduced infiltration capacity, the WQ_v must be increased by an additional 20%.

Required drain times for the structural post-construction BMPs are as follows:

BMP	**Drain Time of WQ_v**
Infiltration	24 – 48 hours
Vegetated Swale and Filter Strip	24 hours
Extended Detention Basin (Dry Basins)	48 hours
Retention Basins (Wet Basins)*	24 hours
Constructed Wetlands (above permanent pool)	24 hours
Media Filtration, Bioretention	40 hours

* Provide both a permanent pool and an extended detention volume above the permanent pool, each sized at 0.75 * WQ_v

- Table 2. OEPA Permit OHC000002, Part III.G.2.e

If the designer chooses to use a BMP other than those listed in the above table, it must have equivalent effectiveness. In other words, it must be designed to drain over a minimum of 24 hours, it must have a total suspended solids removal of 85 – 88%, and it must capture 85% of the storms. Also, a plan must be submitted that identifies who is responsible for maintenance.

If a pre-existing drainage structure is going to be used to treat stormwater, it must be shown that it is sized appropriately to treat the WQ_v.

Redevelopment Projects

For redevelopment projects that disturb more than 5 acres of land, post-construction BMPs must ensure a 20% net reduction of the site impervious area or provide treatment for 20% of the WQv. A combination of the two may be acceptable.

Chapter
6

SWP^3

Non-Sediment Pollutant Controls

Background

No pollutant is allowed to be discharged in stormwater runoff. Pollutants include solids wastes other than sediment, including building materials, and liquid waste. Pollutants must be disposed of in a proper manner in accordance with local, state and federal regulations.

Toxic or Hazardous Materials

Plan general notes must include language on how to properly dispose of toxic or hazardous materials and procedures for proper spill clean up. This information can be general unless the designer has knowledge of a specific chemical being used on the site. The plans must provide areas for recycling of used or unused hazardous materials. This requirement has been implemented to eliminate the disposal of toxic and hazardous materials into storm drains, septic tanks, or by burying, burning or mixing the wastes.

Waste Disposal

Containers must be available on the construction site for the disposal of debris, trash, hazardous or petroleum wastes. All containers must be covered and leak-proof.

Clean Hard Fill

Clean hard fill is considered to be bricks, concrete and uncontaminated soil waste. Clean hard fill may be used on the construction site, but there should be language on the plans stating that it must have no contaminants.

Note: Check with the Lake County General Health District for more detailed information on what qualifies as clean hard fill.

Construction and Demolition Debris

All construction and demolition debris (CD&D) must be disposed of in an Ohio EPA approved CD&D landfill or a solid waste landfill. The plans must include a note that directs such debris to be disposed of in a proper manner. Open burning of construction waste or land clearing waste is not permitted.

Construction Chemical Debris

The plans must designate an area for mixing and storing of compounds such as fertilizers, lime, asphalt, or concrete. They should be stored inside if possible, or under a cover. The storage areas must be located away from watercourses, drainage ditches, field drains, or other stormwater drainage areas.

Equipment Fueling and Maintenance

The site plans must designate an area for fueling and/or performing vehicle maintenance. This area must be away from watercourses, drainage ditches, field drains, or other water drainage areas.

Any site that has one or more storage tank of 660 gallons or more, total above ground tank storage of 1330 gallons, or below ground tank storage of 42,000 gallons of fuel must prepare a Spill Prevention Control and Countermeasures (SPCC) plan.

Concrete Wash Waters

All concrete wash waters must be directed to a designated site located away from watercourses, drainage ditches, field drains, or other water drainage areas. This site must be shown on the plans and clearly identified on the construction site.

Contaminated Soils

Notes must be included on the site plans indicating the handling and disposal requirements for petroleum or other chemically contaminated soils.

Spill Reporting Requirements

The SWP^3 must include a note directing individuals to contact Ohio EPA at 800-282-9378, the local fire department, and the local emergency planning committee (440-951-5252) in the event of a spill of petroleum fuel (>25 gallons) or the presence of a sheen. On projects north of Route 2, the Coast Guard must also be notified.

Notes must also be present detailing a spill response for a small release (less than 25 gallons).

Open Burning

Open burning is prohibited.

Dust Controls/Suppressants

The SWP^3 should provide a note about the need for dust controls. If dust controls are required near catch basins, storm sewers or other drainage areas, inlet protection must be implemented. It should be noted that oil is strictly prohibited for use as a dust suppressant.

APPENDIX C

Nature and Type of Construction Activity

- ☐ Low Density Residential (< 4 dwellings/acre)
- ☐ Medium Density Residential (4 to 8 dwellings/acre)
- ☐ High Density Residential (>8 dwellings/acre)
- ☐ Commercial
- ☐ Industrial
- ☐ Roadway
- ☐ Utility
- ☐ Other

_____

Disturbed Area:

Total area to be disturbed (ex. Grubbing, clearing, excavating, fill, etc. including off-site borrow and fill areas) _____ acres.

Runoff Coefficient:

Land Use	**Runoff Coefficient**	**Total Area on Project Site**	**Percentage**	**Weighted Coefficient**
Industrial & Commercial	0.8			
High Density Residential (>8 dwellings/acre)	0.5			
Medium Density Residential (4 to 8 dwellings/acre)	0.4			
Low Industry Residential (<4 dwellings/acre)	0.3			
Open Space and Recreational Areas	0.2			
Total	**--**		**100**	

Drainage Area: _____

Impervious Area:

Site Condition	**Percentage**	**Area (acres)**
Pre-Construction		
Post-Construction		

Site Soil Type: _____

APPENDIX C

Description of any historical stormwater quality monitoring activity at site (attach results):

_____
_____
_____

Prior Land Use: _____

Construction Implementation Schedule:

a. Clearing

b. Grubbing

c. Install Erosion and Sediment Control Devices

Location: _____

d. Temporary Seeding

a. Location: _____

e. _____

f. _____

g. _____

h. _____

Note: attach more detail if necessary.

Receiving Waters:

List the receiving waters for stormwater drainage, include distances to these waters.

_____
_____
_____

Pre-construction stormwater flows to _____ waterbody.
Post-construction stormwater flows to _____ waterbody.

APPENDIX C

Wetlands and other Aquatic Resources:

Describe any wetlands or special aquatic resources located on or adjacent to the proposed site.

_____
_____
_____

Batch Plants

Is there dedicated asphalt or concrete batch plants associated with this project?

☐ Yes ☐ No

If so, please describe the stormwater discharges associated with the plant and the stormwater BMPs associated with that.

_____
_____
_____

Remember: Attach a copy of the NPDES Construction Stormwater General Permit to the SWP[3] (Appendix F).

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