

# PLANS / ENGINEERING – THE STARTING POINT



NORTHWEST INDIANA “TRAINED INDIVIDUAL” EROSION CONTROL  
CONSTRUCTION SITE CERTIFICATION WORKSHOP



## Ground Rules:

1. “The only dumb question is the one you didn’t ask.” Feel Free to ask a question at any point during the presentation.
2. “There is no right answer.” There is almost always multiple ways to address a problem.
3. **Disclaimer:** The opinions and products presented in this presentation are those of the presenter and do not reflect the views of any regulatory body. The practices presented are not to be considered an endorsement of any product.



## Regulatory Review

*Why are we here? Federal Laws:*

1. Federal Water Pollution Control Act of 1948
2. 1972 Amendments became known as the Clean Water Act
3. 1981 Amendments
4. 1987 Amendments
5. Other – Title 1 of the Great Lakes Critical Programs Act of 1990

Summary:

Concern for discharge of pollutants has been around a long time is not likely to go away!

## Regulatory Review



Indiana:

1. “Rule 5” – 327 IAC 15-5 until Dec 18, 2021
2. Now – Administered under Construction Stormwater General Permit (CSGP)

However, land-disturbing activities *still* require a construction stormwater pollution prevention plans (SWPPP) and an NOI!

## Regulatory Review



### Important applicability requirements:

1. An SWPPP is required when disturbing 1 or more acres of land and an NOI must be sent to IDEM.
2. *Local requirements* may include a SWPPP for land disturbing activities less than 1 ac, e.g. 0.5 acres of disturbance. (NOI to IDEM not required.)



## Regulatory Review

Another Important applicability requirement:

Local operators of municipal separate storm sewer systems (MS4's) prohibit illicit discharges to the MS4 conveyance systems.

Illicit discharges are defined as: any discharge to a MS4 conveyance that is not composed entirely of stormwater, except *naturally introduced* floatables, such as leaves or tree limbs. Sources of illicit discharges include but is not limited to sanitary wastewater, septic tank effluent, commercial car wash wastewater, oil spills or disposal, radiator flushing disposal, laundry wastewater, roadway accident spillage, **pollutant run-off**, and household hazardous wastes

Almost anything in stormwater could be an illicit discharge!



## Regulatory Review

BMPs:

“Best management practices”

“Practices used to prevent and mitigate soil erosion and movement of sediment.”

Note the use of “best”. While implementing these practices is not a guarantee of stopping soil erosion or movement of sediment, they will reduce the potential erosion, reduce the time soil is exposed to erosive forces and reduce the amount of sediment leaving the site.



## Regulatory Review

BMPs:

**Maintenance** must be the primary focus of the those implementing a SWPPP and of the regulatory agency inspecting.

Inspect and repair as needed after each rainfall event (commonly 0.5 inches or greater).

Nonetheless, turbid water may be observed leaving the site due to very fine suspended sediment.

What to do?





## Regulatory Review

BMPs:

What to do?

1. Again, make sure all practices are in good working order.
2. Look upstream and determine if surface stabilization is being implemented and is working.
3. **“If it can’t be eroded, it won’t be transported”**
4. Consider different practices such as the use of polymers.



# Erosion and Sediment Transport Review

What is erosion?

Erosion is the process in which earthen materials are dislodged and transported by natural forces such as wind or water.

So, there are two actions we need to address – suspension and transport.



## The SWPPP

Consider the SWPPP as a starting guide. There will be unique circumstances when you get out in the field that may be better addressed with a different practices other than provided on the SWPPP. From the CSGP:

“The stormwater pollution prevention plan (SWP3) will serve as a guideline for stormwater management but should not be interpreted to be the only basis for implementation of stormwater measures for a project site. The permittee is responsible for implementing all measures necessary to comply with the provisions of this permit.”

**Just remember to document the changes in the SWPPP!**



## The SWPPP

What should be in the SWPPP?

Review of a SWPPP by an MS4 or other regulatory agency includes the use of a checklist.

Example checklist:





# The SWPPP

## Plan Review Information

- The technical review and comment is intended to evaluate the completeness of the Construction/Stormwater Pollution Prevention Plan for the project. The Plan submitted was not reviewed for the adequacy of engineering design. All measures included in the plan, as well as those recommended in the comments should be evaluated as to their feasibility by a qualified individual with structural measures designed by a qualified engineer. The Plan has not been reviewed for other local, state, or federal permits that may be required to proceed with this project.
- Additional information, including design calculations may be requested to further evaluate the plan.
- All proposed stormwater pollution prevention measures and those referenced in this review must meet the design criteria and standards set forth in the "Indiana Stormwater Quality Manual" from the Indiana Department of Environmental Management or similar Guidance Documents.
- Construction activities and unforeseen weather conditions may affect the performance of the erosion and sediment control system, individual measures, or the effectiveness of the plan. The plan must be a flexible document, with provisions to modify or substitute measures as necessary to ensure compliance.

## Section A: Construction Plan Elements

| Adequate   | Deficient                | NA                       | A  |  |
|--|--------------------------|--------------------------|----|--|
| The construction plan elements include general information associated with the project site that are critical for the evaluation of the stormwater pollution prevention plan component. This information includes, but is not limited to an index, resource information, reference maps, grading information, project layout and design, and drainage plan |                          |                          |    |  |
| <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | 1  | Index of the location of required plan elements in the construction plan   |
| <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | 2  | A vicinity map depicting the project site location in relationship to recognizable local landmarks, towns, and major roads   |
| <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | 3  | Narrative of the nature and purpose of the project   |
| <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | 4  | Latitude and longitude to the nearest fifteen (15) seconds of the project entrance or beginning of project for linear projects   |
| <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | 5  | Legal description of the project site. The description must include the legal section(s), or alternative land division(s), township and range  |
| <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | 6  | Reduced plat or project site map that is submitted on a sheet or sheets no larger than eleven (11) inches by seventeen (17) inches for all phases or sections associated with this plan, lot numbers/boundaries, and road layout/name, and legend          |
| <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | 7  | Boundaries of the one hundred (100) year floodplains, floodway fringes, and floodways  |
| <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | 8  | Land use of all adjacent properties  |
| <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | 9  | Identification of a U.S. EPA approved or established TMDL, including the name of the TMDL and the pollutant(s) for which there is a TMDL   |
| <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | 10 | Name(s) of the receiving water(s) and, when the discharge is to a system (storm sewer, stormwater management measure, etc.) owned/or operated by a municipality, city, town, or county, the name of the system operator and the ultimate receiving water   |
| <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | 11 | Identification of discharges to a water on the current 303d list of impaired waters and the pollutant(s) for which it is impaired  |
| <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | 12 | Soil map of the predominant soil types that includes soil properties, characteristics, limitations, and hazards associated with the project site and the measures that will be integrated into the project to overcome or minimize adverse soil conditions |
| <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | 13 | Identification and location of all known wetlands, lakes and water courses on or adjacent to the project site (construction plan, existing site layout.)   |
| <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | 14 | Identification and status of any other state or federal water quality permits or authorizations that are required for construction activities and the expected timeline if the permits have not been obtained  |
| <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | 15 | Identification and delineation of natural buffers and existing vegetative cover, such as crop or crop residue, grass, weeds, brush, and trees  |
| <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | 16 | Existing topography at a contour interval appropriate to indicate drainage patterns  |



# The SWPPP

| Adequate  | Deficient                | NA                       | A  |   |
|---|--------------------------|--------------------------|----|---|
| <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | 17 | Location(s) of where run-off enters the project site  |
| <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | 18 | Location(s) of where run-off discharges from the project site prior to construction   |
| <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | 19 | Location of all existing structures on the project site   |
| <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | 20 | Location, size, and dimensions of features, such as existing permanent retention or detention facilities, including manmade wetlands, designed for the purpose of stormwater management |
| <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | 21 | Locations where stormwater may be directly discharged into ground water, such as abandoned wells, sinkholes, or karst features  |
| <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | 22 | Size of the project area expressed in acres   |
| <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | 23 | Total expected land disturbance expressed in acres  |
| <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | 24 | Proposed topography   |
| <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | 25 | Delineation of all proposed land-disturbing activities, including known off-site activities that will provide services to the project site  |
| <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | 26 | Location, size, and dimensions of all stormwater drainage systems, such as culverts, storm sewers, and conveyance channels  |
| <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | 27 | Locations of specific points where stormwater and non-stormwater discharges will leave the project site   |
| <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | 28 | Location of all proposed site improvements, including roads, utilities, lot delineation and identification, proposed structures, and common areas                                       |
| <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | 29 | Location of all on-site soil stockpiles and borrow areas and, when known at the time of submittal, the location of all off-site borrow, soil stockpiles, and disposal areas             |
| <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | 30 | Construction support activities that are expected to be part of the project (e.g., staging areas, disposal sites, etc.)   |
| <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | 31 | Location of any in-stream activities that are planned for the project including, but not limited to stream crossings and pump arounds   |
| <b>Section A – Comments:</b>  |                          |                          |    |   |
| <ul style="list-style-type: none"> <li>Evaluate areas with potential waters of the state and, where required, verify if permits/authorizations are required prior to any impacts to waters of the state. These potential resources include areas with hydric soil, hydrophytic vegetation, pooling water, or evidence of flowing water such as swales, ditches, drains, or natural conveyances. Evaluation of hydric soil, hydrophytic vegetation, or pooling water should conform to the US Army Corps of Engineers Wetlands Delineation Manual, Technical Report Y-87-1, and the applicable regional supplement <a href="https://www.usace.army.mil/Missions/Civil-Works/Regulatory-Program-and-Permits/reg_supp/">https://www.usace.army.mil/Missions/Civil-Works/Regulatory-Program-and-Permits/reg_supp/</a>. Avoidance and minimization of impacts to waters of the state should be prioritized.</li> <li></li> </ul> |                          |                          |    |   |



# The SWPPP

| Section B: Stormwater Pollution Prevention Plan – Erosion and Sediment Control/Project Site Management  |                          |                          |          |
|---|--------------------------|--------------------------|----------|
| Adequate  | Deficient                | NA                       |          |
| <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <b>B</b> |
| <p>The construction component of the Stormwater Pollution Prevention Plan includes stormwater quality measures to address erosion, sedimentation, and other pollutants associated with land disturbance and construction activities. Proper implementation of the plan, maintenance of measures, and administering a self-monitoring program is required to manage the project site to minimize the discharge of sediment and other pollutants. Construction activities and unforeseen weather conditions may affect the performance of the erosion and sediment control system, individual measures, or the effectiveness of the plan. The plan must be a flexible document, with provisions to modify or substitute measures as necessary to ensure compliance.</p> |                          |                          |          |
| <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | 1        |
| Description of the potential pollutant generating sources and pollutants, including all potential non-stormwater discharges   |                          |                          |          |
| Where applicable, items in 2 through 10 below will be evaluated for Location, dimensions, detailed specifications, and construction details   |                          |                          |          |
| <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | 2        |
| Stable construction entrance locations and specifications (at all points of ingress and egress)   |                          |                          |          |
| <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | 3        |
| Specifications for temporary and permanent stabilization  |                          |                          |          |
| <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | 4        |
| Sediment control measures for concentrated flow areas   |                          |                          |          |
| <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | 5        |
| Sediment control measures for sheet flow areas  |                          |                          |          |
| <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | 6        |
| Run-off control measures (e.g., diversions, rock check dams, swales, etc.)  |                          |                          |          |
| <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | 7        |
| Stormwater outlet protection locations and specifications   |                          |                          |          |
| <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | 8        |
| Grade stabilization structure locations and specifications  |                          |                          |          |
| <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | 9        |
| Dewatering applications and management methods (basin outlet measures, flocculants etc.)  |                          |                          |          |
| <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | 10       |
| Measures utilized for work within waterbodies (crossings, coffer dams, etc.)  |                          |                          |          |
| <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | 11       |
| Maintenance guidelines for each proposed temporary stormwater quality measure   |                          |                          |          |
| <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | 12       |
| Planned construction sequence describing the relationship between implementation of stormwater quality measures and temporary/permanent stabilization measures in relation to land disturbance  |                          |                          |          |
| <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | 13       |
| Provisions for erosion and sediment control on individual building lots regulated under this project  |                          |                          |          |
| <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | 14       |
| Material handling and spill prevention and spill response plan meeting the requirements in 327 IAC 2-6.1  |                          |                          |          |
| <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | 15       |
| Material handling and storage procedures associated with construction activity describing the management and disposal of construction products and waste, including concrete and cementitious washout areas and management measures   |                          |                          |          |
| <b>Section B – Comments:</b>  |                          |                          |          |
| <ul style="list-style-type: none"> <li>Stormwater quality measures for the reduction of sediment have not been evaluated for adequacy of design. The proposed measures included in this SWP3 are being accepted based on the design engineer's submittal.</li> <li></li> </ul>  |                          |                          |          |





# The SWPPP

| Section C: Stormwater Pollution Prevention Plan – Post-Construction  |                          |                          |   |   |
|--|--------------------------|--------------------------|---|---|
| Adequate   | Deficient                | NA                       | C |   |
| <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | 1 | Description of potential pollutant generating sources and a list of pollutants from the final land use that may reasonably be expected to contribute pollutants to stormwater discharges  |
| <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | 2 | Description of stormwater quality and stormwater management measures that will be installed to address post-construction sources that are expected to generate pollutants in stormwater discharges and increased run-off after construction activities have been completed          |
| <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | 3 | Location, dimensions, detailed specifications, and construction details of all post-construction stormwater quality and stormwater management measures listed in C2 above   |
| <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | 4 | Sequence describing when each post-construction stormwater measure will be installed in relation to project construction activities including how post-construction measures will be protected from impacts if the measure is installed during active construction/land disturbance |
| <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | 5 | Operation and maintenance manual for each post-construction stormwater measure (manufactured/proprietary measures may include a link to the manual for a specific measure that will be used on the project)   |
| <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | 6 | Entity that will be responsible for operation and maintenance of the post-construction system (if known)  |
| <p><b>Section C – Comments:</b></p> <ul style="list-style-type: none"> <li>• Post-construction stormwater quality and quantity measures have not been evaluated for adequacy of design. The proposed measures included in this SWP3 are being accepted based on the design engineer's submittal.</li> <li>• The rate of stormwater run-off and/or volume from the project site must meet local requirements to address stormwater quantity as established by ordinance or other regulatory mechanism. When a local requirement does not exist, the post-development run-off discharge from the project site must not exceed the pre-development discharge based on the two-year, ten-year, and one-hundred-year peak storm events.</li> <li>•</li> </ul> |                          |                          |   |   |



## The SWPPP

How to approach creating the SWPPP?

The “satellite view” or overall approach

Remember, the goal is not to discharge soil / sediment from the site.

Start with the perimeter.

# The SWPPP



|                          |                          |                          |          |   |
|--------------------------|--------------------------|--------------------------|----------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <b>2</b> | Stable construction entrance locations and specifications (at all points of ingress and egress) |
|--------------------------|--------------------------|--------------------------|----------|---|

Item #B2 – Stable construction entrance

Also look at the perimeter – especially discharge points (#A18).

|                          |                          |                          |           |   |
|--------------------------|--------------------------|--------------------------|-----------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <b>18</b> | Location(s) of where run-off discharges from the project site prior to construction |
|--------------------------|--------------------------|--------------------------|-----------|---|



## The SWPPP

### Perimeter Protection:

1. Silt Fence
2. Silt Sock

(Will be discussed in more detail later)



## The SWPPP

What About Those Discharge Points?

Outfall protection

(Examples later)



## The SWPPP

### Soils (A12)

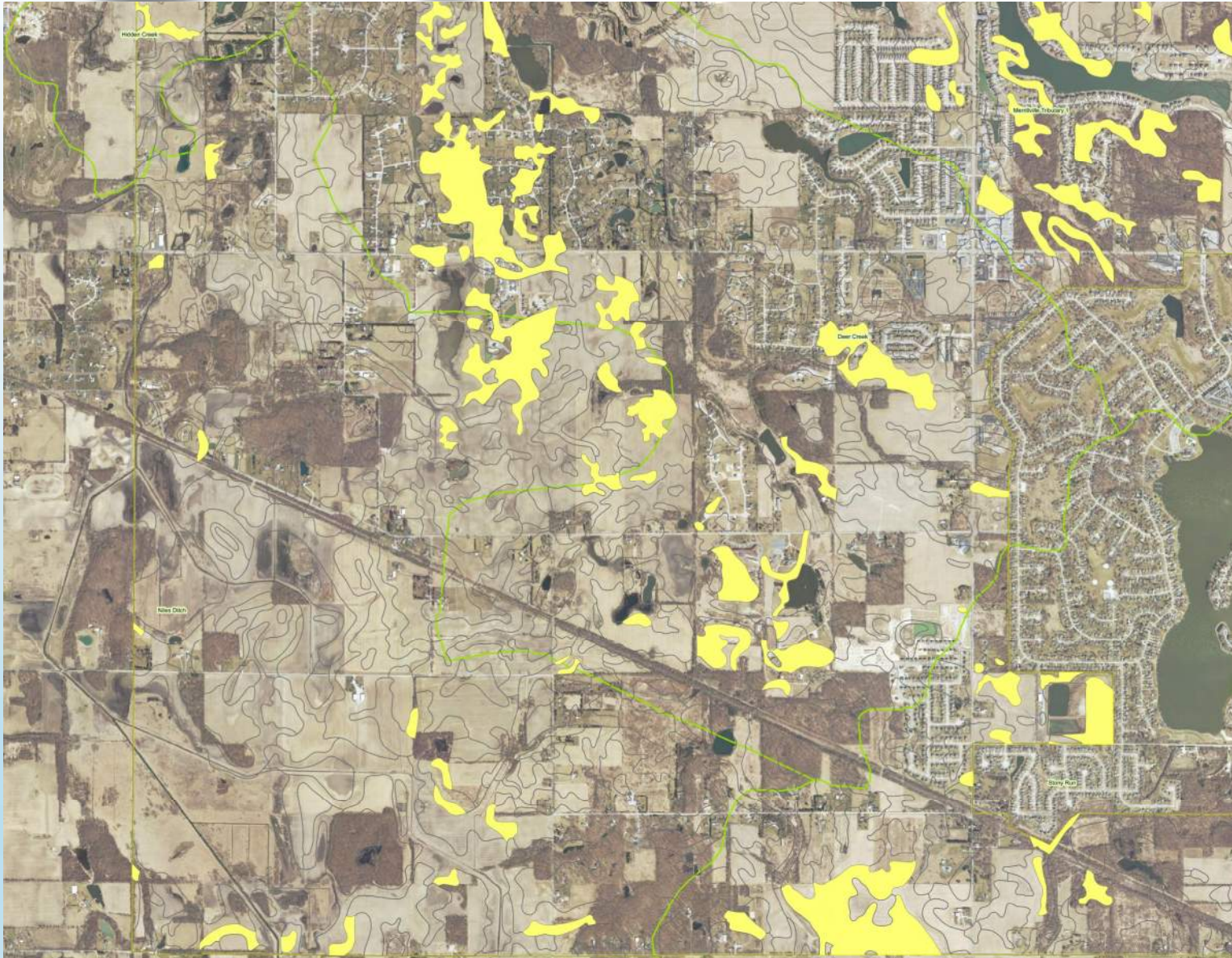
|                          |                          |                          |           |  |
|--------------------------|--------------------------|--------------------------|-----------|--|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <b>12</b> | Soil map of the predominant soil types that includes soil properties, characteristics, limitations, and hazards associated with the project site and the measures that will be integrated into the project to overcome or minimize adverse soil conditions |
|--------------------------|--------------------------|--------------------------|-----------|--|

There are some soils more susceptible to erosion, i.e. highly erodible land (HEL) or highly erodible soil (HES).

# The SWPPP



Soils





Soils

HEL should get special consideration.

|                          |                          |                          |           |  |
|--------------------------|--------------------------|--------------------------|-----------|--|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <b>12</b> | Planned construction sequence describing the relationship between implementation of stormwater quality measures and temporary/permanent stabilization measures in relation to land disturbance |
|--------------------------|--------------------------|--------------------------|-----------|--|

Both phasing and stabilization should be consideration:

Performing all earth disturbing activities in the HEL area early in the project (phasing) and stabilizing **ASAP** should be considered.

Stabilizing could include the use of blankets and additional perimeter protection.





## Soils

Just as a reminder from the CSGP:

*“Stabilization must be initiated by the end of the **seventh day** the area is left idle. The stabilization activity must be completed within fourteen (14) days after initiation. Initiation of stabilization includes, but is not limited to, the seeding and/or planting of the exposed area and applying mulch or other temporary surface stabilization methods where appropriate.”*



## Soils

### Additional Notes:

1. You don't always need a map to find highly erodible soils – look for sandy soils in the field.
2. Also keep an eye out for clay soils. Clay soils have very fine particle sizes and stay suspended for a long period of time. This will be a hint that practices with long settling times will be more effective.



### Specific Practices – Construction Entrance Examples

#### Gravel:

Two gravel courses with geotextile on the bottom. Requires monitoring and removal / replacement of top layer

#### Matting:

Alternate to gravel – geotextile with built-in ridges to knock off soil. May be reusable for lighter traffic, may not hold up under heavier traffic. May used on pavement.

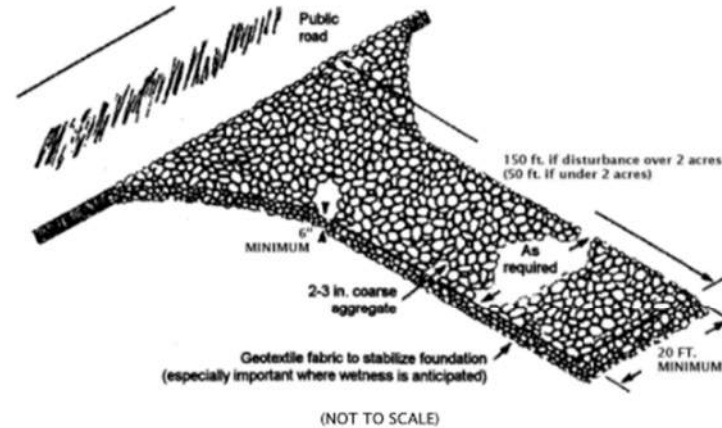
#### Existing Pavement:

Sometimes shown as entrance for unique circumstances. Requires daily monitoring and cleaning.

# Specific Practices – Construction Entrances Gravel:

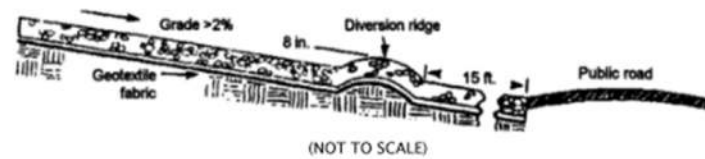
## TEMPORARY CONSTRUCTION ENTRANCE/EXIT PAD

- MATERIAL:** 2 TO 3 INCHES OF WASHED STONE (INDOT #2 AGGREGATE) OVER A STABLE FOUNDATION
- THICKNESS:** 6 INCHES MINIMUM
- WIDTH:** 20 FEET MINIMUM OR FULL WIDTH OF ENTRANCE/EXIT ROADWAY, WHICHEVER IS GREATER
- LENGTH:** 150 FEET MINIMUM (50 FEET MINIMUM IF SITE DISTURBANCE IS UNDER 2.0 ACRES)
- WASHING FACILITY:** LEVEL AREA WITH 3 INCHES OF WASHED STONE (MINIMUM) OR A COMMERCIAL RACK AND WASTE WATER DIVERTED TO A SEDIMENT TRAP OR BASIN (PRACTICE 3.72)
- GEOTEXTILE FABRIC UNDERLINER:** MAY BE USED UNDER WET CONDITIONS OR FOR SOILS WITHIN A HIGH SEASONAL WATER TABLE TO PROVIDE GREATER BEARING STRENGTH



### INSTALLATION:

1. AVOID LOCATING ON STEEP SLOPES OR AT CURVES IN PUBLIC ROADS.
2. REMOVE ALL VEGETATION AND OTHER OBJECTIONABLE MATERIAL FROM THE FOUNDATION AREA, AND GRADE AND CROWN FOR POSITIVE DRAINAGE.
3. IF SLOPE TOWARDS THE ROAD EXCEEDS 2%, CONSTRUCT A 6-8 IN. HIGH WATER BAR (RIDGE) WITH 3:1 SIDE SLOPES ACROSS THE FOUNDATION AREA ABOUT 15 FT. FROM THE ENTRANCE TO DIVERT RUNOFF AWAY FROM THE ROAD (PRACTICE 3.24) SEE EXHIBIT.
4. INSTALL PIPE UNDER THE PAD IF NEEDED TO MAINTAIN PROPER PUBLIC ROAD DRAINAGE.
5. IF WET CONDITIONS ARE ANTICIPATED, PLACE GEOTEXTILE FABRIC ON THE GRADED FOUNDATION TO IMPROVE STABILITY.
6. PLACE STONE TO DIMENSIONS AND GRADE SHOWN IN THE EROSION/SEDIMENT CONTROL PLAN, LEAVING THE SURFACE SMOOTH AND SLOPED FOR DRAINAGE.
7. DIVERT ALL SURFACE RUNOFF AND DRAINAGE FROM THE STONE PAD TO A SEDIMENT TRAP OR BASIN.



### MAINTENANCE:

1. INSPECT ENTRANCE PAD AND SEDIMENT DISPOSAL AREA WEEKLY AND AFTER STORM EVENTS OR HEAVY USE.
2. RESHAPE PAD AS NEEDED FOR DRAINAGE AND RUNOFF CONTROL.
3. TOP-DRESS WITH CLEAN STONE AS NEEDED.
4. IMMEDIATELY REMOVE MUD AND SEDIMENT TRACKED OR WASHED ONTO PUBLIC ROADS BY BRUSHING OR SWEEPING. FLUSHING SHOULD ONLY BE USED IF THE WATER IS CONVEYED INTO A SEDIMENT TRAP OR BASIN.
5. REPAIR ANY BROKEN ROAD PAVEMENT IMMEDIATELY.

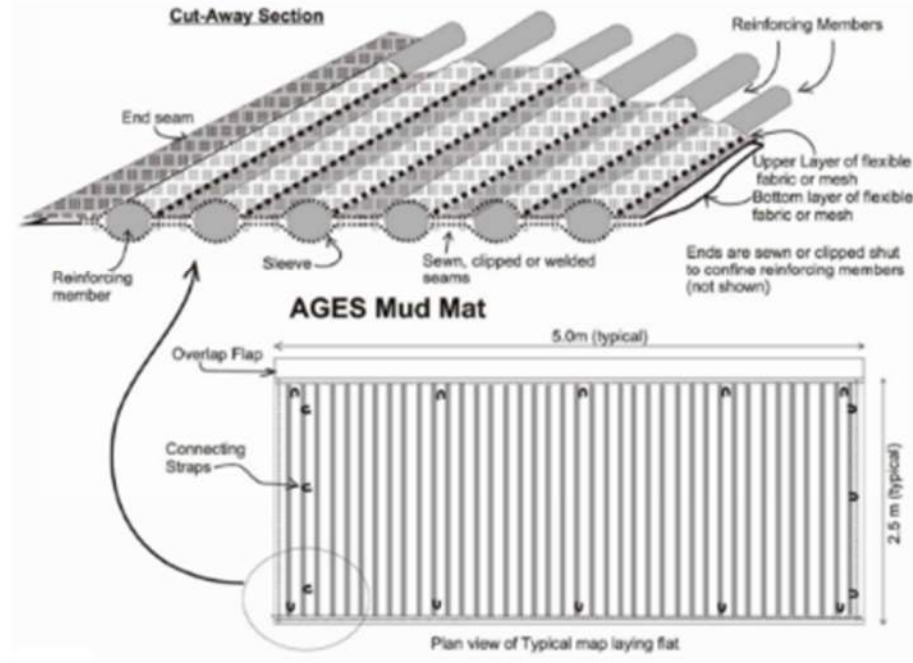
The  
SWPPP



# Specific Practices – Construction Entrances Matting:

## MUD MATS - ENTRANCE STABILIZATION

MATERIAL: MUD MAT BY AGES, RE-USABLE SOIL STABILIZATION SYSTEM OR APPROVED EQUAL



(NOT TO SCALE)

### INSTALLATION:

1. AVOID LOCATING ON STEEP SLOPES OR AT CURVES IN PUBLIC ROADS.
2. REMOVE ALL VEGETATION AND OTHER OBJECTIONABLE MATERIAL FROM THE FOUNDATION AREA, AND GRADE AND CROWN FOR POSITIVE DRAINAGE.
3. INSTALL PER MANUFACTURER'S RECOMMENDATIONS. UNROLL, CONNECT MATS TOGETHER TO FORM AREA OF PROTECTION AND PROPERLY ANCHOR TO GROUND.
4. DIVERT ALL SURFACE RUNOFF AND DRAINAGE FROM THE MUD MAT TO A SEDIMENT TRAP OR BASIN.
5. MINIMUM SIZE OF THE MAT IS 12 FEET WIDE AND 50 FEET LONG.

### MAINTENANCE:

1. INSPECT ENTRANCE PAD DAILY AND REMOVE BUILT-UP DEBRIS AS NECESSARY.
2. INSPECT ENTRANCE PAD FOR BREAKS AND TEARS IN THE MATERIAL. REPAIR OR REPLACE AS NECESSARY.
3. IMMEDIATELY REMOVE MUD AND SEDIMENT TRACKED OR WASHED ONTO PUBLIC ROADS BY BRUSHING OR SWEEPING. FLUSHING SHOULD ONLY BE USED IF THE WATER IS CONVEYED INTO A SEDIMENT TRAP OR BASIN.
4. REPAIR ANY BROKEN ROAD PAVEMENT IMMEDIATELY.

# The SWPPP





## Specific Practices – Perimeter Protection

### Silt Fence:

Generally, stops or drastically reduces sheet flow allowing sediment laden runoff to drop suspended particles. Higher flow rate geotextiles are available but will be less effective on particle removal

### Silt Logs

May allow higher flow rate to pass, acting more as a filter.

NOTE: Neither will function well in very high / concentrated flow applications

# Specific Practices

## – Perimeter Protection

### Silt Fence:

## SILT FENCE

**APPROACH:** POOL AREA FLAT (LESS THAN 1% SLOPE), WITH SEDIMENT STORAGE OF 945 CU.FT./ACRE DISTURBED.

**MATERIALS:** ECONOMY BLUE STRIPE SILT FENCE WITH POSTS, MANUFACTURED BY MIDWEST CONSTRUCTION PRODUCTS AT (800) 532-2381 OR APPROVED EQUAL.

**ANCHORING:** 2 INCH BY 2 INCH HARDWOOD STAKES WITH A LENGTH EQUAL TO THE HEIGHT OF THE SILT FENCE PLUS 1 FOOT.

**INSTALLATION:**

1. DRIVE STAKES 1 FT. (MINIMUM) INTO GROUND AND ATTACH FABRIC TO STAKES WITH STAPLER.
2. BOTTOM OF FABRIC SHALL BE PLACED UNDER 6 INCHES COMPACTED SOIL TO PREVENT SEDIMENT FLOW UNDERNEATH THE FENCE.
3. ENSURE THAT ALL SUPPORTING POSTS ARE ON THE DOWN SLOPE SIDE OF THE FENCING.

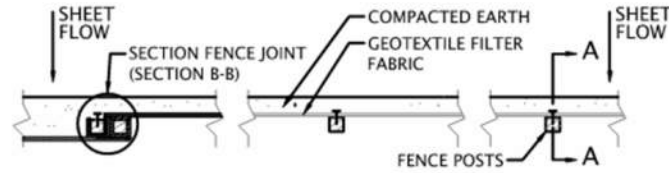
**MAINTENANCE:**

1. INSPECT AFTER EACH STORM EVENT.
2. REMOVE BUILT-UP SEDIMENT AND REPAIR/REPLACE THE SILT FENCE AS NEEDED.

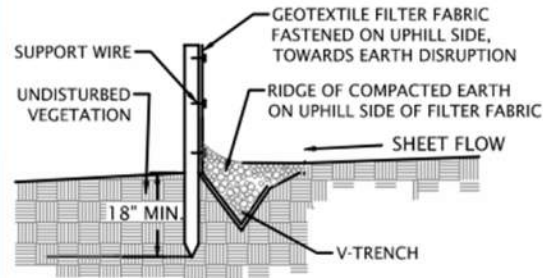
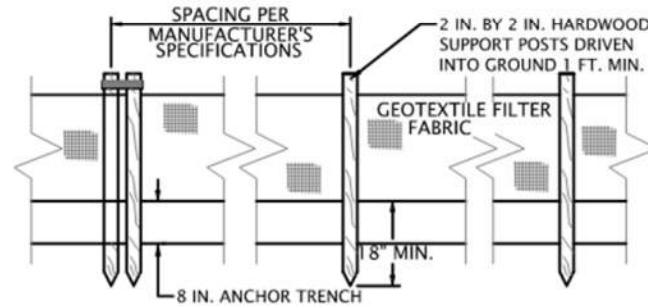
**ADDITIONAL CONSIDERATIONS:**

1. WHEN PROTECTING SLOPES, FENCES SHOULD BE INSTALLED PARALLEL TO THE SLOPE CONTOUR.
2. ON SLOPES, THE STEEPNESS OF GRADE WILL DETERMINE THE MAXIMUM DISTANCE BETWEEN PARALLEL FENCES.

|                   |  |
|-------------------|--|
| LESS THAN 2%      | 100 FT. MAX.                                       |
| BETWEEN 2% AND 5% | 75 FT. MAX.  |
| GREATER THAN 5%   | ADDITIONAL SURFACE STABILIZATION SHALL BE PROVIDED |



UNDISTURBED VEGETATION



SECTION A-A



SECTION B-B

## The SWPPP



# Specific Practices – Perimeter Protection

Silt Log:

## SILT-WORM

MATERIAL: SILT-WORM OR APPROVED EQUAL  
DIAMETER: 9 INCHES MINIMUM

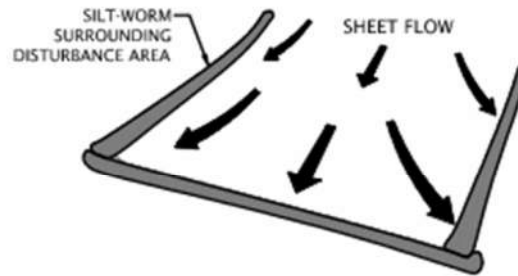
### MAINTENANCE:

1. SILTWORM SHALL BE INSPECTED AFTER EACH RUNOFF EVENT AND SHALL BE REMOVED AND REPLACED IF SIGNS OF UNDERCUTTING OR DOWN STREAMING RILLS ARE OBSERVED
2. SEDIMENT SHALL BE REMOVED FROM BEHIND THE SILTWORM WHEN IT HAS ACCUMULATED TO  $\frac{1}{2}$  THE ORIGINAL HEIGHT OF THE STRUCTURE AND PAID FOR UNDER ITEM NUMBER 209-05, SEDIMENT REMOVAL PER CUBIC YARD.

### PERIMETER CONTROL

#### INSTALLATION:

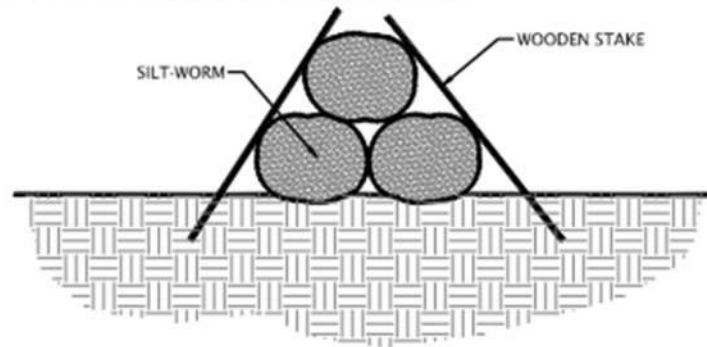
1. PLACE SILTWORM DIRECTLY ON TOP OF GRADE FOR GRADES UNDER 12%.
2. ARRANGE PERIMETER CONTROL IN A MANNER THAT IS APPLIED PERPENDICULAR TO SHEET FLOW.
3. OVERLAP CONTIGUOUS SECTIONS OF SILT WORM AT A MINIMUM OF 6 INCHES.



### STACKING

#### INSTALLATION:

1. PLACE SILTWORM DIRECTLY ON TOP OF GRADE FOR GRADES UNDER 12%.
2. STACK SILTWORM IN A STAGGERED MANNER, AS SHOWN BELOW.
3. OVERLAP CONTIGUOUS SECTIONS OF SILT-WORM AT A MINIMUM OF 6 INCHES.



# The SWPPP







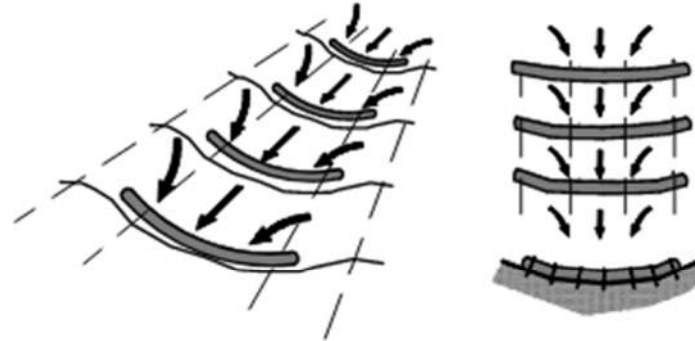
## Specific Practices – Perimeter Protection

Silt Log:

### SLOPE INTERRUPTION / DITCH CHECK

#### INSTALLATION:

1. PLACE SILT-WORM PERPENDICULAR TO SHEET FLOW AND CURL ENDS UP TOWARD TOP OF SLOPE.
2. STAKE THE SILT-WORM EVERY 4 FEET AND OVERLAP THE ENDS BETWEEN 1 AND 2 FEET.
3. PLACE A LINE OF DEFENSE AT THE TOP OF THE SLOPE AND ANOTHER WITHIN 10 FEET FROM TOE OF SLOPE.



| SPACING FOR SLOPE APPLICATION |        |         |         |         |
|-------------------------------|--------|---------|---------|---------|
| SLOPE                         | 9-inch | 12-inch | 18-inch | 24-inch |
| 2% or less                    | 70 ft. | 80 ft.  | N/A     | N/A     |
| 5%                            | 30 ft. | 60 ft.  | 80 ft.  | N/A     |
| 10%                           | 20 ft. | 30 ft.  | 70 ft.  | 80 ft.  |
| 6:1                           | N/A    | 20 ft.  | 40 ft.  | 55 ft.  |
| 4:1                           | N/A    | 20 ft.  | 30 ft.  | 30 ft.  |
| 3:1                           | N/A    | N/A     | 20 ft.  | 25 ft.  |
| 2:1                           | N/A    | N/A     | 20 ft.  | 20 ft.  |



## Specific Practices – Inlet Protection

Curb Inlet -

Insert (Basket) Curb Inlet Protection

Stone Bag Inlet Protection

Lock and Gravel Curb Inlet Protection

Don't forget back of Curb!

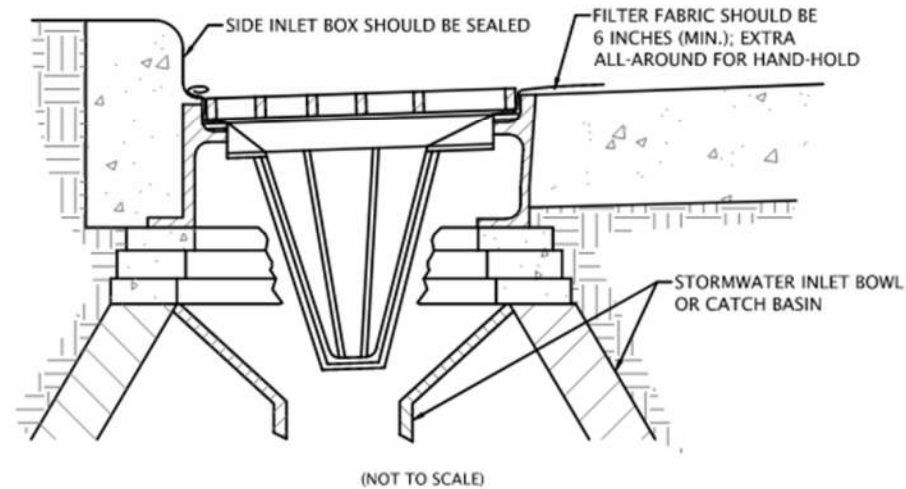
# Specific Practices – Inlet Protection

## Insert

### INLET PROTECTION - CURB BASKET

|                             |  |
|-----------------------------|--|
| CONTRIBUTING DRAINAGE AREA: | 0.25 ACRE MAXIMUM  |
| LOCATION:                   | AT CURB INLETS WHERE BARRIERS SURROUNDING THEM WOULD BE IMPRACTICAL OR UNSAFE                              |
| MATERIAL:                   | D2 CATCH-ALL INLET PROTECTOR OR APPROVED EQUAL<br>D2 LAND & WATER RESOURCE (WWW.D2LWR.COM OR 800-597-2180) |
| CAPACITY:                   | RUNOFF FROM A 2-YEAR FREQUENCY, 24-HOUR DURATION STORM EVENT ENTERING A STORM DRAIN WITHOUT BYPASS FLOW    |
| BASKET:                     | FABRICATED METAL WITH TOP WIDTH/LENGTH DIMENSIONS SUCH THAT THE BASKET FITS INTO THE INLET WITHOUT GAPS    |
| GEOTEXTILE FABRIC:          | FOR FILTRATION   |

- INSTALLATION:
1. INSTALL BASKET CURB INLET PROTECTIONS AS SOON AS INLET BOXES ARE INSTALLED IN THE NEW DEVELOPMENT OR BEFORE LAND-DISTURBING ACTIVITIES BEGIN IN A STABILIZED AREA.
  2. IF NECESSARY, ADAPT BASKET DIMENSIONS TO FIT INLET BOX DIMENSIONS, WHICH VARY ACCORDING TO THE MANUFACTURER AND/OR MODEL.
  3. SEAL THE SIDE INLETS ON THOSE TYPES OF INLET BOXES THAT HAVE THEM.
  4. REMOVE THE GRATE AND PLACE THE BASKET IN THE INLET.
  5. CUT AND INSTALL A PIECE OF FILTER FABRIC LARGE ENOUGH TO LINE THE INSIDE OF THE BASKET AND EXTEND AT LEAST 6 INCHES BEYOND THE FRAM.
  6. REPLACE THE INLET GRATE, WHICH ALSO SERVES TO ANCHOR THE FABRIC.



- MAINTENANCE:
1. INSPECT AFTER EACH STORM EVENT.
  2. REMOVE BUILT-UP SEDIMENT AND REPAIR (OR REPLACE IF NECESSARY) THE GEOTEXTILE FABRIC AFTER EACH STORM EVENT.
  3. PERIODICALLY REMOVE SEDIMENT AND TRACKED-ON SOIL FROM THE STREET (BUT NOT BY FLUSHING WITH WATER) TO REDUCE THE SEDIMENT LOAD ON THIS CURB INLET PRACTICE.
- COMMON CONCERNS:
1. SEDIMENT NOT REMOVED AND GEOTEXTILE FABRIC NOT REPLACED FOLLOWING A STORM EVENT RESULTS IN INCREASED SEDIMENT, TRACKING, TRAFFIC HAZARD, AND EXCESSIVE PONDING.
  2. GEOTEXTILE FABRIC PERMITTIVITY THAT IS TOO LOW RESULTS IN RAPID CLOGGING AND CAUSES SEVERE PONDING WITH SEDIMENT ENTERING THE DRAIN IF THE FABRIC BREAKS.
  3. DRAINAGE AREA TOO LARGE RESULTS IN SEDIMENT OVERLOAD AND SEVERE PONDING; SEDIMENT ENTERS THE DRAIN IF FABRIC BREAKS.

# The SWPPP





## Specific Practices – Inlet Protection

### Insert

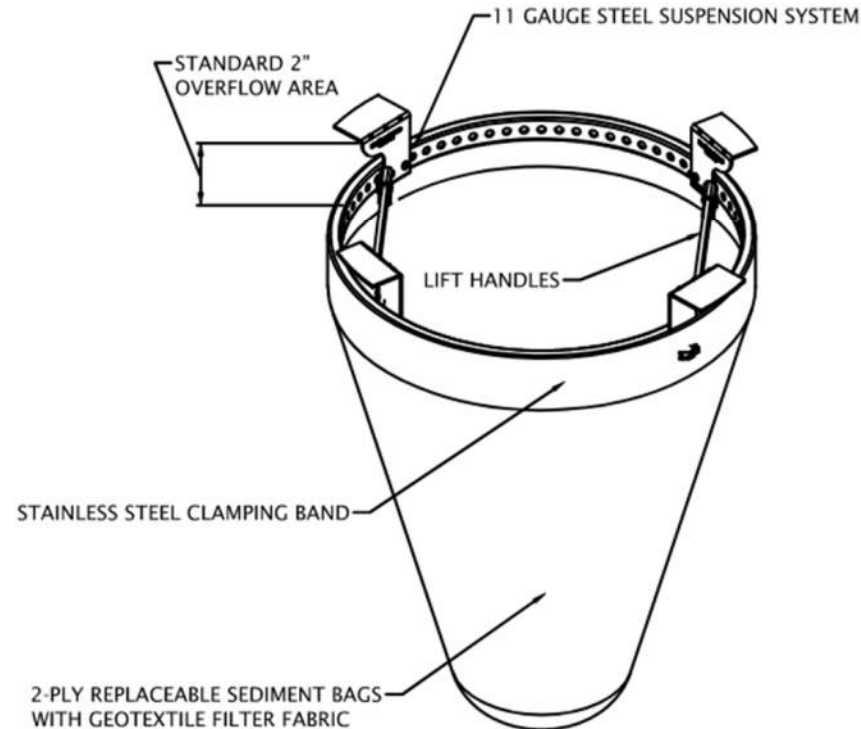
(Soil Density ~ 165  
to 175 lb/ft<sup>3</sup>!!!)

#### CAPACITY:

| Nominal Bag Size | Solids Storage (CuFt) | Filtered Flow Rate at 50% Max (CFS) |               |
|------------------|-----------------------|-------------------------------------|---------------|
|                  |                       | FX (Woven)                          | IL (NonWoven) |
| Small            | 1.6                   | 1.2                                 | 0.9           |
| Medium           | 2.1                   | 1.7                                 | 1.3           |
| Large            | 3.8                   | 2.7                                 | 1.9           |
| XL               | 4.2                   | 3.6                                 | 2.6           |

#### INSTALLATION:

1. REMOVE GRATE; INSTALL PRIOR TO LAND DISTURBING ACTIVITIES AND/OR IMMEDIATELY AFTER DRAINAGE STRUCTURES HAVE BEEN INSTALLED
2. DROP INLET PROTECTION ONTO LOAD BEARING LIP OF CASTING OR CONCRETE STRUCTURE.
3. REPLACE GRATE.



(NOT TO SCALE)



## Specific Practices – Inlet Protection

### Surface Inlet -

Excavated Drop Inlet Protection

Gravel Donut Drop Inlet Protection

Geotextile Fabric Drop Inlet Protection

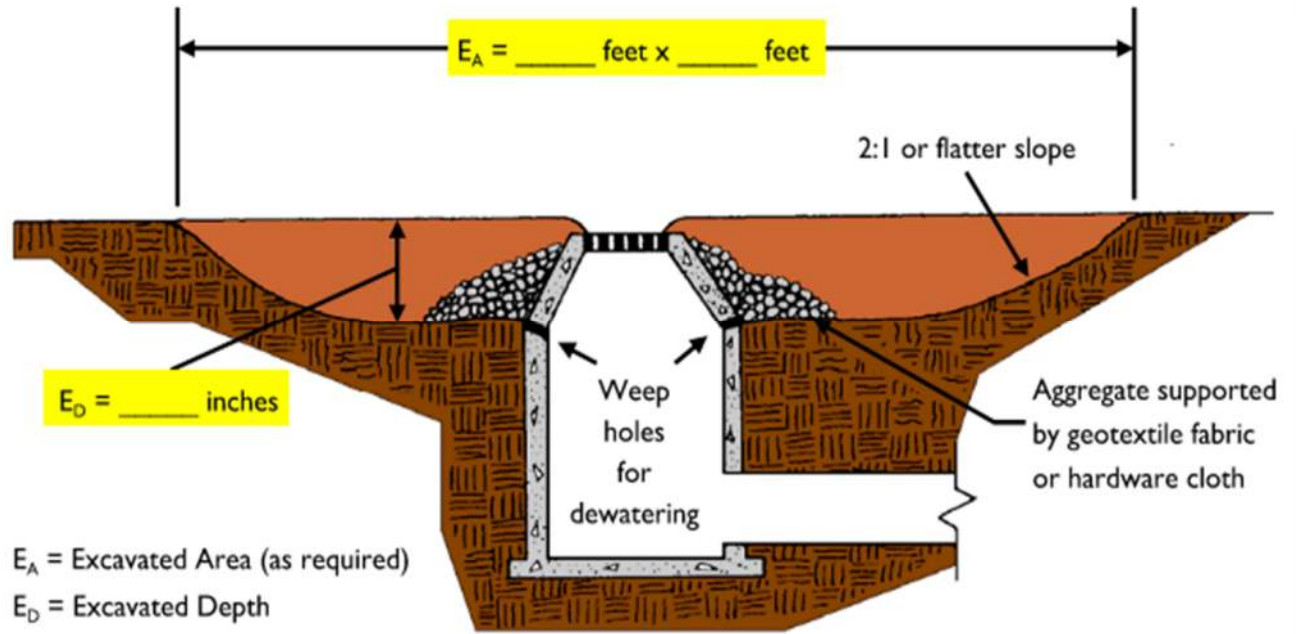
Straw Bale Drop Inlet Protection

Block and Gravel Drop Inlet Protection

**Basket Not So Good**



## Specific Practices – Inlet Protection



Source: Adapted from North Carolina Erosion and Sediment Control Planning and Design Manual, 1993

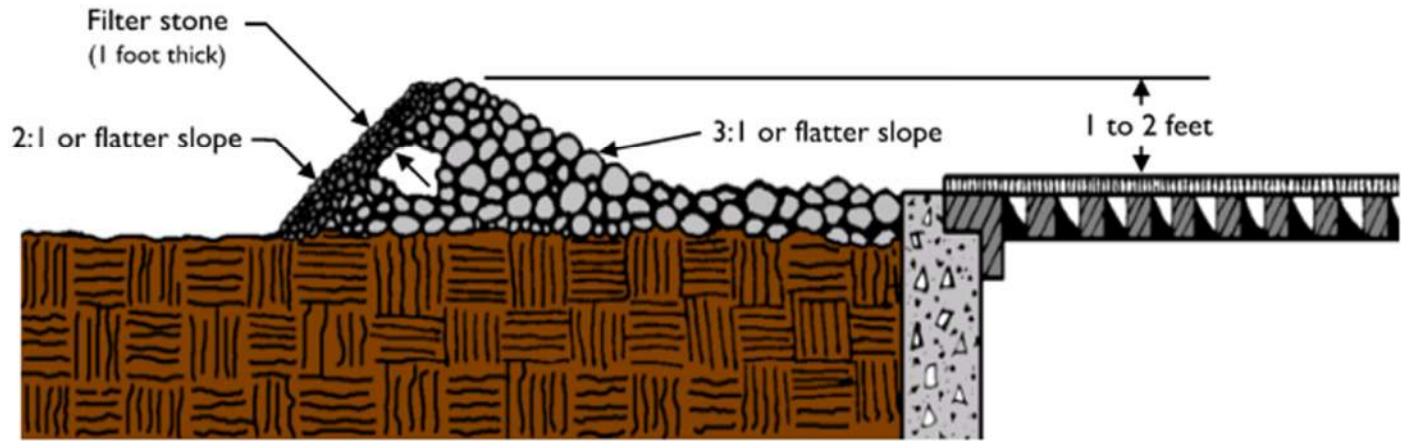
1 Ac Max!



## Specific Practices – Inlet Protection Gravel Donut



Exhibit 2



Source: Adapted from North Carolina Erosion and Sediment Control Planning and Design Manual, 1993

1 Ac Max!



## Specific Practices – Outlet Protection

### Examples:

- Energy Dissipator
- Rock-Lined Chute
- Concrete Block Chute
- Reinforced Vegetated Chute



## RIP RAP AT PIPE OUTLET

- MATERIAL:** HARD, ANGULAR AND WEATHER-RESISTANT, HAVING A SPECIFIC GRAVITY OF AT LEAST 2.5
- GRADATION:** WELL-GRADED STONE, 50% (BY WEIGHT) LARGER THAN THE SPECIFIED  $d_{50}$ ; HOWEVER, THE LARGEST PIECES SHOULD NOT EXCEED TWO TIMES THE SPECIFIED  $d_{50}$  AND NO MORE THAN 15% OF THE PIECES (BY WEIGHT) SHOULD BE LESS THAN 3 INCHES.
- FILTER:** USE GEOTEXTILE FABRIC FOR STABILIZATION AND FILTRATION OR SAND/GRAVEL LAYER PLACED UNDER ALL PERMANENT RIP RAP INSTALLATIONS.
- SLOPE:** 2:1 OR FLATTER, UNLESS APPROVED IN THE EROSION AND SEDIMENT CONTROL PLAN.

### SUBGRADE PREPARATION

1. REMOVE BRUSH, TREES, STUMPS AND OTHER DEBRIS.
2. EXCAVATE ONLY DEEP ENOUGH FOR BOTH FILTER AND RIP RAP. OVER-EXCAVATION INCREASES THE AMOUNT OF SPOIL CONSIDERABLY.
3. COMPACT ANY FILL MATERIAL TO THE DENSITY OF THE SURROUNDING UNDISTURBED SOIL.
4. SMOOTH THE GRADED FOUNDATION.

### FILTER PLACEMENT

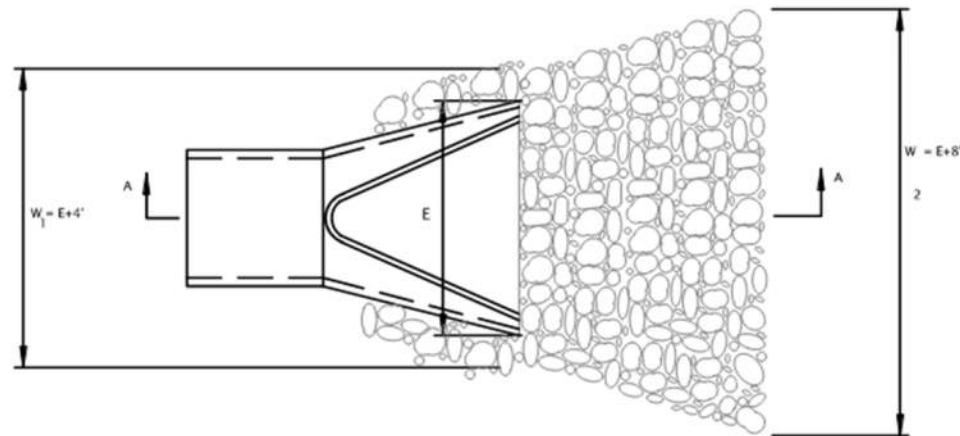
1. IF USING GEOTEXTILE FABRIC, PLACE IT ON THE SMOOTHED FOUNDATION, OVERLAP THE EDGES AT LEAST 12 INCHES AND SECURE WITH ANCHOR PINS SPACED EVERY 3 FEET ALONG THE OVERLAP.
2. IF USING A SAND/GRAVEL FILTER, SPREAD THE WELL-GRADED AGGREGATE IN A UNIFORM LAYER TO THE REQUIRED THICKNESS (6 INCHES MINIMUM); IF TWO OR MORE LAYERS ARE SPECIFIED, PLACE THE LAYER OF SMALLER GRADATION FIRST AND AVOID MIXING THE LAYERS.

### RIP RAP PLACEMENT

1. IMMEDIATELY AFTER INSTALLING THE FILTER, ADD THE RIP RAP TO FULL THICKNESS IN ONE OPERATION. DO NOT DUMP THROUGH CHUTES OR USE ANY METHOD THAT CAUSES SEGREGATION OF ROCK SIZES OR THAT WILL DISLODGE OR DAMAGE THE UNDERLYING FILTER MATERIAL.
2. IF FABRIC IS DAMAGED, REMOVE THE RIP RAP AND REPAIR BY ADDING ANOTHER LAYER OF FABRIC, OVERLAPPING THE DAMAGED AREA BY 12 INCHES.
3. PLACE SMALLER ROCK IN VOIDS TO FORM A DENSE, UNIFORM AND WELL-GRADED MASS. SELECTIVE LOADING AT THE QUARRY AND SOME HAND PLACEMENT MAY BE NEEDED TO ENSURE AN EVEN DISTRIBUTION OF ROCK MATERIAL.
4. BLEND THE ROCK SURFACE SMOOTHLY WITH THE SURROUNDING AREA TO ELIMINATE PROTRUSIONS OR OVER-FALLS.

### MAINTENANCE

1. INSPECT PERIODICALLY FOR DISPLACED ROCK MATERIAL, SLUMPING AND EROSION AT EDGES, ESPECIALLY DOWN-STREAM OR DOWN-SLOPE.



PLAN  
(NOT TO SCALE)

## The SWPPP



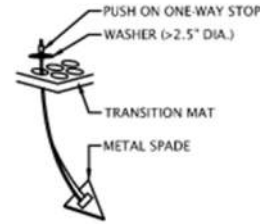
## Specific Practices – Outlet Protection

# Specific Practices – Outlet Protection

## SCOURSTOP TRANSITION MAT FOR SCOUR PROTECTION

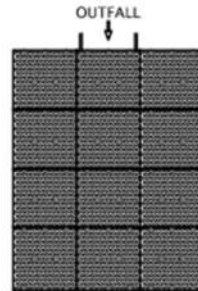
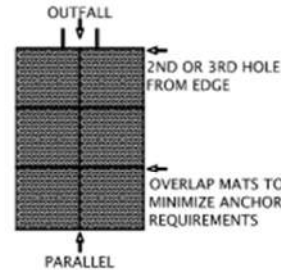
MATERIAL: SCOUR STOP TRANSITION MATS  
 WH SHURTLEFF COMPANY  
 11 WALLACE AVENUE  
 SOUTH PORTLAND, ME 04106  
 (800) 663-6149  
 WWW.WHSHURTLEFF.COM

| PIPE DIAMETER | DISCHARGE (CFS) | SCOURSTOP WIDTHxLENGTH |
|---------------|-----------------|------------------------|
| 12"           | 8               | 4' x 4'                |
| 24"           | 30              | 4' x 8'                |
| 36"           | 75              | 8' x 12'               |
| 48"           | 100             | 12' x 16'              |
| 60"           | 150             | 12' x 20'              |
| 72"+          |                 | SEE DETAILS            |

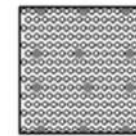


ANCHOR REQUIREMENTS\*:  
 FIRST ROW OF SCOURSTOP MATS - MINIMUM OF 8 ANCHORS  
 SECTION ROW OF SCOURSTOP MATS - MINIMUM OF 5 ANCHORS

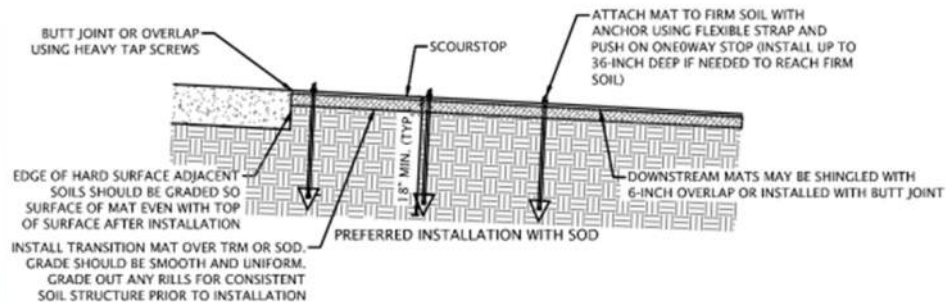
\* TO ENSURE CONSISTENT CONTACT WITH THE SOIL, EXCEED THE MINIMUM ANCHOR REQUIREMENT AT INSTALLATION OR IMPROVE SOIL SURFACE SMOOTHNESS



SHORELINE PROTECTION:



- ANCHOR CONFIGURATION FOR SLOPES STEEPER THAN 5:1
- TRANSITION MATS OVER A MINIMUM 8 OZ. GEOTEXTILE
- POSITION ANCHORS TO SECURE SCOURSTOP MATS FLUSH WITH SOIL SURFACE
- MINIMIZE GAPS OR BRIDGING



NOT TO SCALE

NOTES:

1. INSTALLATION TO BE COMPLETED IN ACCORDANCE WITH MANUFACTURERS' SPECIFICATIONS.
2. DO NOT SCALE DRAWINGS.

MAINTENANCE: (PER LAKE COUNTY STORMWATER TECHNICAL STANDARDS MANUAL)

1. INSPECT AFTER EACH RAINFALL EVENT DURING ESTABLISHMENT OF VEGETATION. INSPECT YEARLY AFTER VEGETATION ESTABLISHED.
2. REPAIR/ REVEGETATE AS NEEDED.

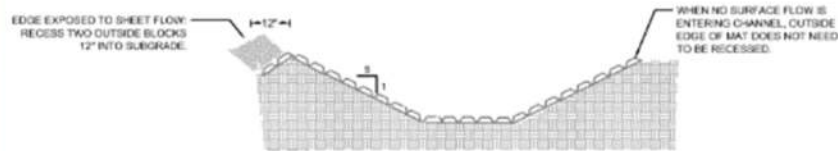
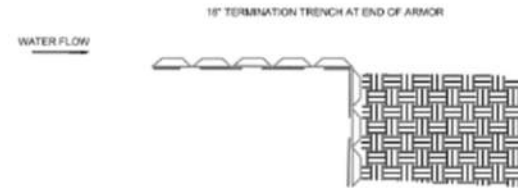
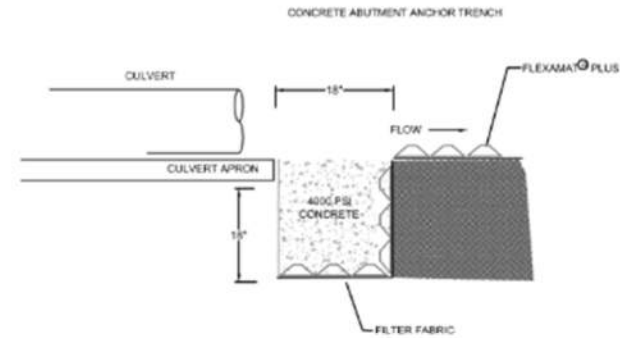
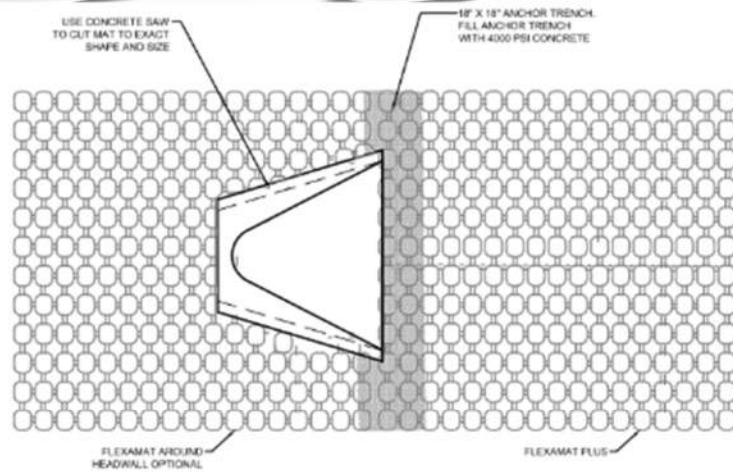
# The SWPPP





# The SWPPP

## Specific Practices – Outlet Protection



| PIPE DIAMETER | DISCHARGE (CFS) | FLEXAMAT PROTECTION WIDTH | FLEXAMAT PROTECTION LENGTH (MIN) |
|---------------|-----------------|---------------------------|----------------------------------|
| 12"           | 8 CFS           | 5.5'                      | 5'                               |
| 18"           | 20 CFS          | 8'                        | 8'                               |
| 24"           | 30 CFS          | 8'                        | 10'                              |
| 30"           | 75 CFS          | 12'                       | 15'                              |
| 48"           | 100 CFS         | 18'                       | 20'                              |
| 60"           | 150 CFS         | 20'                       | 25'                              |

\*LENGTH OF PROTECTION WILL VARY ON THE LENGTH OF THE SLOPE, DEGREE OF SLOPE, OR IF IT IS DISCHARGING ONTO A FLAT AREA. OUTFALLS DISCHARGING ONTO SLOPES, IT IS RECOMMENDED TO EXTEND FLEXAMAT THE LENGTH OF THE SLOPE AND 7' PAST THE TOE.

\*CONSULT MANUFACTURER FOR GUIDANCE IF DESIGN DISCHARGE VARIES SIGNIFICANTLY FROM VALUES LISTED IN TABLE.

### FLEXAMAT INFORMATION

Manufacturer: Motz Enterprises, Inc.  
 Product Name: Flexamat®  
 Address: 3153 Madison Road  
 Cincinnati, Ohio 45209  
 Telephone: 513-772-MOTZ (6689)  
 Fax: 513-772-6690  
 Email: Info@Flexamat.com  
 Website: www.Flexamat.com

### CONSTRUCTION NOTES:

1. GRADE CHANNEL SO THAT WATER WILL FLOW DOWN THE CENTER OF THE CHANNEL AND BE CONTAINED TO THE CHANNEL. ALL SUBGRADE SURFACES PREPARED FOR PLACEMENT OF MATS SHALL BE SMOOTH AND FREE OF ALL ROCKS, STICKS, ROOTS, OTHER PROTRUSIONS, OR DEBRIS OF ANY KIND. THE PREPARED SURFACE SHALL PROVIDE A FIRM UNYIELDING FOUNDATION FOR THE MATS.
2. WHEN VEGETATION IS DESIRED, APPLY SEED DIRECTLY TO THE PREPARED SOIL PRIOR TO FLEXAMAT INSTALLATION. USE SEED PER PROJECT SPECIFICATIONS.
3. INSTALL FLEXAMAT ROLLS. AVAILABLE WIDTHS ARE 4', 5.5', 8', 10', 12', & 16' AVAILABLE IN CUSTOM LENGTHS.
4. AT THE BEGINNING OF CHANNEL THE INITIAL LEADING EDGE OF FLEXAMAT EXPOSED TO CONCENTRATED FLOWS SHALL BE EMBEDDED 18" VERTICALLY INTO ANCHOR TRENCH. THE TRENCH SHALL BE FILLED WITH 4000 PSI CONCRETE.
5. AT THE END OF THE ARMORED CHANNEL, EMBED THE MAT 16" IN A TERMINATION TRENCH. FILL AND COMPACT TERMINATION TRENCH WITH COHESIVE FILL.



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## Specific Practices – Stockpiles and Sloped Areas

### “KEEP IT LOCAL”

- Intercept sheet flow around base of stockpiles
- Space practices on slopes

## The SWPPP



### Specific Practices – Seeding Schedules

Plans should provide both temporary and permanent seeding schedules

**Always include mulch or a blanket to prevent suspension!!!**

# The SWPPP



## Specific Practices – Seeding Schedules

| TEMPORARY SEEDING DATES |      |      |      |      |     |      |      |      |       |      |      |      |
|-------------------------|------|------|------|------|-----|------|------|------|-------|------|------|------|
|                         | JAN. | FEB. | MAR. | APR. | MAY | JUNE | JULY | AUG. | SEPT. | OCT. | NOV. | DEC. |
| WHEAT OR RYE            |      |      |      |      |     |      |      |      |       |      |      |      |
| OATS                    |      |      |      |      |     |      |      |      |       |      |      |      |
| ANNUAL RYEGRASS         |      |      |      |      |     |      |      |      |       |      |      |      |
| PERMANENT SEEDING DATES |      |      |      |      |     |      |      |      |       |      |      |      |
| NON-IRRIGATED *         |      |      |      |      |     |      |      |      |       |      |      |      |
| IRRIGATED               |      |      |      |      |     |      |      |      |       |      |      |      |
| DORMANT SEEDING **      |      |      |      |      |     |      |      |      |       |      |      |      |

■ IRRIGATION NEEDED DURING THIS PERIOD TO CONTROL EROSION AT TIMES OTHER THAN IN THE SHADED AREAS. USE MULCH.

\* LATE SUMMER SEEDING DATES MAY BE EXTENDED 5 DAYS IF MULCH IS APPLIED.

\*\* INCREASE SEEDING APPLICATION BY 50%.

| SEASONAL SOIL PROTECTION CHART |      |      |      |      |     |          |      |      |       |      |      |      |
|--------------------------------|------|------|------|------|-----|----------|------|------|-------|------|------|------|
| STABILIZATION PRACTICE         | JAN. | FEB. | MAR. | APR. | MAY | JUNE     | JULY | AUG. | SEPT. | OCT. | NOV. | DEC. |
| PERMANENT SEEDING              |      |      | A    |      |     | ///1///* |      |      | 1/    |      |      |      |
| DORMANT SEEDING                | B    |      |      |      |     |          |      |      |       |      | B    |      |
| TEMPORARY SEEDING              |      |      | C    | E    |     | ///1///* |      |      |       |      |      |      |
| SODDING                        |      |      | F**  |      |     | ///1///* |      |      |       |      |      |      |
| MULCHING                       | G    |      |      |      |     |          |      |      |       |      |      |      |

A - KENTUCKY BLUEGRASS 100 LBS./ACRE; CREEPING RED FESCUE 100 LBS./ACRE; PLUS 2 TONS STRAW MULCH/ACRE, OR ADD ANNUAL RYEGRASS 20 LBS./ACRE

B - KENTUCKY BLUEGRASS 120 LBS./ACRE; CREEPING RED FESCUE 120 LBS./ACRE;

C - SPRING OATS - 5 BUSHELS/ACRE

D - WHEAT OR RYE - 2 BUSHELS/ACRE

E - ANNUAL RYEGRASS 40 LBS./ACRE (1 LB/1000 SQ. FT.)

F - 500

G - STRAW MULCH 2 TONS/ACRE

\* IRRIGATION NEEDED DURING JUNE, JULY, AUGUST AND/OR SEPTEMBER

\*\* - IRRIGATION NEEDED FOR 2 TO 5 WEEKS AFTER SUPPLYING SOD

#### MAINTENANCE:

1. WATER.
2. INSPECT WEEKLY, AND AFTER EACH RAINFALL EVENT.
3. RESEED/REMULCH THIN SPOTS AND AS NECESSARY.

## SEEDING SCHEDULE

SCALE: NTS

# Specific Practices – Seeding Schedules

## The SWPPP



### 1. GENERAL SEEDING NOTES:

FERTILIZER AND AGRICULTURAL LIMESTONE SHALL BE SPREAD UNIFORMLY OVER THE AREA TO BE SEEDED. THEY SHALL BE MIXED INTO THE TOP 2" OF SOIL WITH A DISK HARROW, ROTARY TILLER, OR OTHER APPROVED EQUIPMENT. FERTILIZER SHALL BE SPREAD AT THE RATE OF 800 POUNDS PER ACRE, AND AGRICULTURAL LIMESTONE AT THE RATE OF 1/2 TON PER ACRE UNLESS OTHERWISE SPECIFIED.

2.

TEMPORARY SEEDING: THE AREAS WHERE STRIPPING, CUTS OR FILLS HAVE BEEN GRADED SHALL BE SEEDED FOR SILT AND EROSION PROTECTION WITH ONE OF THE FOLLOWING METHODS:

- |                             |                    |
|-----------------------------|--------------------|
| A. EARLY SPRING MIX:        | 100% OATS          |
| SEEDING RATE:               | 50 LBS./ACRE       |
| B. SPRING OR LATE FALL MIX: | 100% ANNUAL RYE    |
| SEEDING RATE:               | 50 LBS./ACRE       |
| C. FALL MIX:                | 100% PERENNIAL RYE |
| SEEDING RATE:               | 50 LBS./ACRE       |

3.

STRAW OR MULCH AS APPROVED BY THE ENGINEER SHALL BE APPLIED AT A RATE OF 2 TONS PER ACRE.

HYDRO-SEEDING: HYDRO-SEEDING SHALL BE AS PER INDOT SPECIFICATIONS, SECTION 621, DATED 1988. FERTILIZER SHALL BE 12-12-12 APPLIED AT THE RATE OF 400 POUNDS PER ACRE. SEED MIXTURE SHALL BE 60 POUNDS PER ACRE OF PERENNIAL RYE GRASS AND 60 POUNDS PER ACRE OF KENTUCKY 31 FESCUE OR ALTA FESCUE.

4.

MAINTENANCE: INSPECT WEEKLY AND AFTER EACH RAINFALL EVENT. RESEED AND REMULCH BARREN OR STRIPPED AREAS.



## Specific Practices – Sediment Basins Appropriate for larger areas and larger flows

Sediment basins, where feasible, **must withdraw water from the surface of the water column** unless equivalent sediment reduction can be achieved by use of alternative measures. Alternative measures include but are not limited to increasing the basin length to width ratio to 4:1 or greater, implementation of porous baffles, use of flocculants/polymers, and/or phasing of project land disturbance that also incorporates a rapid stabilization program.



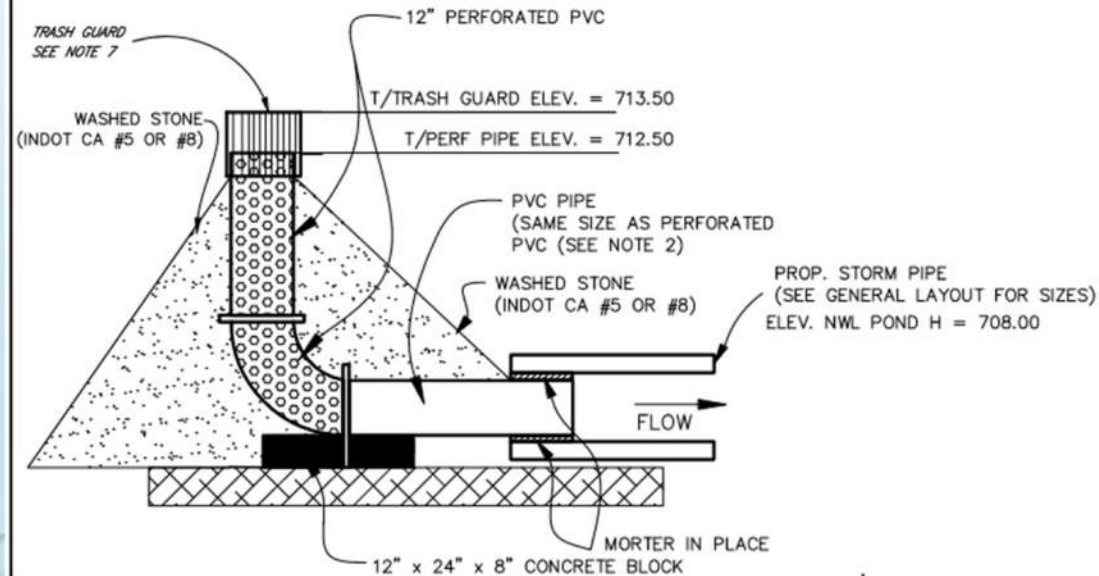


## Specific Practices – Sediment Basins

Does it meet  
current  
requirements?

### NOTES:

1. PLASTIC PIPE: POLYVINYL CHLORIDE (PVC) OR HIGH DENSITY POLYETHYLENE (PE) PIPE WITH SDR EQUAL TO 43 OR LESS.
2. THE ABOVE GROUND PORTION OF THE INLET, MUST HAVE HOLES EVENLY SPACED AROUND THE CIRCUMFERENCE OF THE PIPE.
3. THE BELOW GROUND PORTION OF THE INLET, MAY BE PERFORATED WITH ONE HALF INCH HOLES SPACED THREE INCHES APART. ALTERNATIVELY A PREMANUFACTURED PERFORATED RISER PIPE CAN BE USED. PIPE SHALL BE WRAPPED WITH HARDWARE CLOTH OR SUITABLE WIRE MESH TO A HEIGHT ABOVE THE PERFORATIONS TO PREVENT LETTING STONES PLUG THE PERFORATIONS.
4. THE TEE OR ELBOW DIAMETER MUST BE EQUAL TO OR LARGER THAN THE DIAMETER OF THE CONDUIT DOWNSTREAM FROM INLET.
5. THE UNDERGROUND OUTLET CONDUIT, MUST BE INSTALLED DEEP ENOUGH TO PROVIDE A MIN. 24" OF COVER (AFTER CONSTRUCTION) TO PREVENT CRUSHING.
6. THE RISER IS TO BE INSTALLED AT FLARED END SECTION AND LEFT IN PLACE UNTIL SOIL STABILIZATION OF THE DETENTION BASIN IS COMPLETE.
7. THE TRASH GUARD SHALL BE SECURELY FASTENED TO THE INLET. TRASH GUARDS MAY BE FABRICATED FROM METAL RODS (1/8" DIAMETER OR LARGER) OR GALVANIZED WELDED WIRE FABRIC (16 GAGE OR LARGER). THE SPACING BETWEEN VERTICAL MEMBERS SHOULD BE ONE INCH.





## Specific Practices – Sediment Basins

Does it meet  
current  
requirements?





## The SWPPP

### Specific Practices – Sediment Basins

Does it meet  
current  
requirements?

#### Design Criteria

#### Summary:

Primary Spillway:

Maximum Drainage Area:

Minimum Volume:

Minimum Surface Area:

Minimum L/W Ratio:

Maximum L/W Ratio:

Minimum Depth:

Dewatering Mechanism:

Minimum Dewatering Time:

Baffles Required:

#### Skimmer Sediment Basin

Trapezoidal spillway with impermeable membrane

10 acres

1800 cubic feet per acre of disturbed area

325 square feet per cfs of  $Q_{10}$  peak inflow

2:1

6:1

2 feet

Skimmer

2 days

3 baffles\*

(\*Note: Basins less than 20 feet in length may use 2 baffles.)

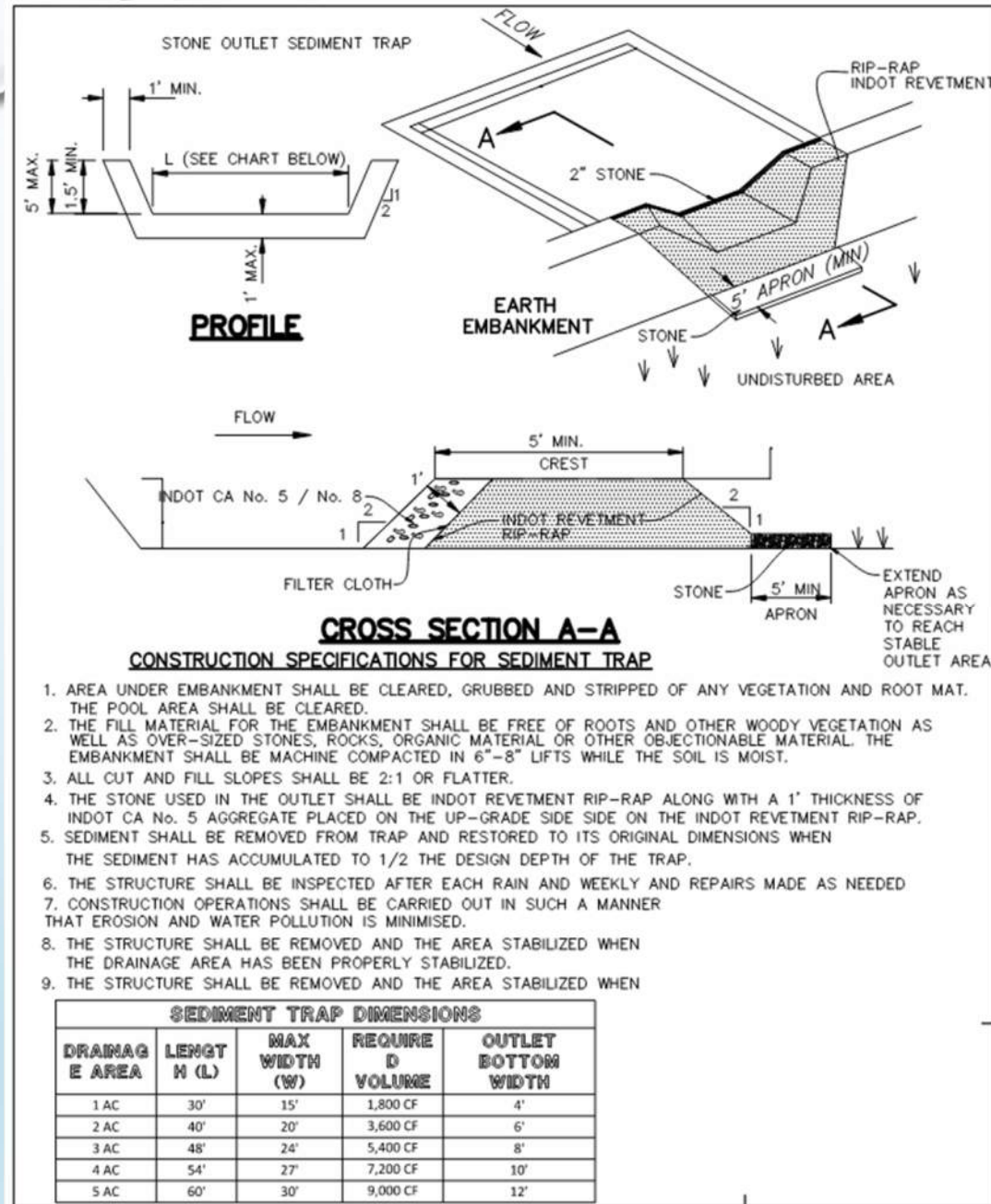
**Drainage areas**—Limit drainage areas to 10 acres.

**Design basin life**—Ensure a design basin life of 3 years or less.



# The SWPPP

## Specific Practices – Sediment Basins



# The SWPPP



## Specific Practices – Maintenance

SWPPP plans must include maintenance guidelines for each practice



# The SWPPP



Specific  
Practices –  
Maintenance

SWPPP plans  
must include  
maintenance  
guidelines for  
each practice





## Specific Practices – Preservation of Buffers

- (1) Existing natural buffers that are adjacent to waters of the state must be preserved to promote infiltration and provide protection of the water resource, unless infeasible.

Natural buffers must be preserved, including the entire buffer bordering and/or surrounding the water resource.

Existing buffers:

- 1) 50 feet or more in width must be preserved to a minimum of 50 feet.
- 2) Less than 50 feet in width must be preserved in their entirety.
- 3) May be enhanced with vegetation that is native and promotes ecological improvement and sustainability.

(A) Run-off directed to the natural buffer must be:

- 1) Treated with appropriate erosion and sediment control measures prior to discharging to the buffer.
- 2) Managed with appropriate run-off control measures to prevent erosion from occurring within the buffer area.



Specific Practices –  
Preservation of Buffers







Questions?