

Chapter 1 – Erosion and Sedimentation

Erosion is the process by which the land surface is worn away by the action of wind, water, and gravity.

Sedimentation is the settling out of soil particles transported by water and wind.

Soil erosion can be classified as either **wind** erosion or **water** erosion, and the sources can be either **natural** or **manmade**.

Water erosion can be classified as either **overland** erosion or **stream** and **channel** erosion.

Four processes of overland erosion are: **Splash or rain drop erosion, sheet erosion, rill erosion, and gully erosion.**

Four principal factors influencing soil erosion are: **Soil characteristics, vegetative cover, topography, and climate.**

List three physical effects of erosion and sedimentation: **Increased flooding reduced hydraulic capacity in rivers, streams, channels, reservoirs; increased maintenance of stormwater systems; increased water treatment costs; and decreased recreational value.**

List three biological effects of erosion and sedimentation: **Reduced light for aquatic plants; clogs fish gills; impairs spawning; disrupts food chain; blankets bottom, suppresses aquatic life; and disrupts ecosystem.**

Plan the development to fit the terrain using the particular: **Topography; soils; drainage patterns; natural vegetation of the site; and minimize the extent of the area exposed at one time and the duration of exposure.**

Apply **perimeter control** practices to protect the disturbed area from off-site runoff and to protect off-site areas from sediment damage.

Apply **erosion control** practices to prevent excessive on-site damage.

Keep runoff velocities **low** and **retain** runoff on the site.

It is very important to stabilize disturbed areas **immediately** after final grading to prevent raindrop impacts from causing erosion.

Implement a thorough **maintenance** and **follow up** (inspection) program as required in the Construction Generic Permit (CGP).

Chapter 2 – Soils

Soil particles smaller than 0.002 mm are classified as clay and along with muck are the two soil types that cause the most erosion/turbidity problems in Florida and the World.

Soils in the Type A hydrologic group have high infiltration rates and low runoff potential even when thoroughly wetted.

Soils in the Type D hydrologic group have very low infiltration rates and high runoff potential when thoroughly wetted.

The rainfall erosion index is the only factor in the Universal Soil Loss Equation which is beyond the developer's control.

Slope length & gradient, and vegetative cover are the factors most easily manipulated by the developer.

The RUSLE is used on our construction sites to predict soil loss.

Stabilize disturbed lands immediately to save money.

Who can you contact for a soil survey information? FDOT, FDEP, Water Management District, Mayor's Office, or NRCS.

What are the five soil forming factors? Climate, topography, organisms, parent material, and time.

Chapter 3 – Temporary BMPs for Erosion and Sedimentation Control

Waste disposal is a problem for the individual workers and some subcontractors, but it's no big deal (True / **False**).

Truck washing should be done in a designated area, not near the perimeter controls. (**True** / False).

Storage of paints, solvents, cements, pesticides, acids, or other potentially polluting chemicals is no big deal because they are only stored temporarily and get used up quickly. (True / **False**).

The public needs to understand that dust is just a normal part of construction. (True / **False**).

A temporary gravel construction entrance must extend the full width of the entrance. It must be at least **50** feet long and at least **6** inches thick. Aggregate should be **2** in. stone or FDOT No. **1** stone. Prior to installing the gravel, a **geotextile** should be placed on the ground to simplify installation and maintenance.

Maintenance of a temporary gravel construction entrance should be performed when void spaces are full of **sediment**.

The maximum drainage area for a silt fence under sheet flow conditions is **1/4** acre per 100 feet of barrier length.

The average usable life of a silt fence is **6** months.

For proper installation of a silt fence, a trench **4** inches deep and **4** inches wide must be excavated. This will allow the **8** inches of fabric to extend into the ground for backfilling and compaction.

The maximum drainage area for an inlet protection device is **1** acre.

When constructing a silt fence drop inlet sediment filter, a trench **4** inches deep and **4** inches wide must be excavated to allow **8** inches of fabric to extend into the trench.

Stakes shall be **2"** x **4"** by **3** feet long and a 2" x 4" frame will be constructed **around the top of the stakes** for proper stability.

The purpose of a sediment trap is to (filter/**detain**) turbid water.

The maximum drainage area for a temporary sediment trap is **5** acres. The initial storage capacity is **134** cu. yd. per acre. Maximum life should be **18** months.

When constructing a pipe outlet sediment trap, the top of the riser pipe must be at least **1.5** feet below the top of the embankment.

When constructing a storm inlet sediment trap, the trap shall be between **1 - 2** feet deep measured from the low point of the outlet.

The purpose of a sediment basin is to (filter/**detain**) turbid runoff from disturbed areas.

A sediment basin is required for a drainage area of more than **10** acres.

In a sediment basin, baffles are used to increase flow length (**True**/False).

The maximum allowable drainage area for a temporary slope drain is **5** acres.

A diversion or earthen dike shall be used to direct stormwater into the temporary slope drain. (**True**/False)

The height of the dike at the inlet shall be equal to the **pipe diameter** plus **6** inches.

The maximum spacing between check dams should be such that the **bottom** of the upstream dam is at same elevation as the **top** of the downstream dam.

Sediment should be removed from check dams, when it reaches **half** of the original height or before.

A floating turbidity curtain is designed to **contain** sediment laden water and allow enough **time** for sediments to settle out of suspension.

A type III floating turbidity curtains may be used in considerable flow conditions, meaning less than **5** feet per second or **3** knots.

In flowing water turbidity curtains should be placed **parallel to / along** the direction of flow, not **perpendicular / across**.

Anchor lines shall be attached to the **buoys**, not to the **bottom of the curtain or float**.

In tidal and/or wind and wave conditions there should be a **one**-foot gap between bottom of the curtain and the floor of the water body at mean low water.

Sediments shall be allowed to settle a minimum of 72 hours prior to removal of the turbidity curtain (True/**False**).

Chapter 4 – Vegetation

The three purposes of soil roughening are: aid in establishment of vegetative cover; reduce runoff velocity & increase infiltration, and reduce erosion and provide for sediment trapping.

The purpose of topsoiling is to provide a suitable growth medium for final site stabilization with vegetation.

The subgrade should be prepared by discing or scarifying to insure bonding of the topsoil with the subsoil.

Areas that are at rough grade for 7 days or more should receive temporary seeding immediately.

List three soil conditioners: peat, sand, vermiculite, rotted manure, rotted sawdust, treated sewage sludge (biosolids).

Name two soil amendments often required prior to permanent seeding: fertilizer and lime.

A stand of vegetation is considered fully established after one year.

When sodding a slope, strips should be laid along the contour. Joints should be staggered. Start from the bottom and work toward the top.

List three beneficial functions of mulch:

1) Protects soil from raindrop erosion, 2) Moderates soil temperature, 3) Moderates soil moisture, 4) Reduces velocity of overland flow, 4) Improves soil texture and/or nutrients, 5) Control/reduce weeds.

Straw mulch should be applied at rate of 70-90 lbs. per 1000 sq. ft.; 1 ½ - 2 bales per 1000 sq. ft.; or 1 ½ - 2 tons per acre.

When installing erosion control nets or blankets, work from the top towards the bottom.

Effective tree protection should be installed no closer than 8 feet from the trunk or the critical root zone (CRZ) of the tree.

A good place for material storage, parking, and portable toilets is inside the tree protection zone. (True / False).

Chapter 5 - Dewatering

What types of dewatering systems generally produce clear, non-turbid groundwater? Well-point & Sock/Horizontal pumps.

What kind of water quality does a rim ditch system produce? The poorest water quality with highest turbidity NTU levels.

What must a well-point and horizontal pump system have in order to function properly? Primarily sandy soil.

What methods are used to manage (treat) nonstormwater discharges & remove sediment from construction pumping? Sediment traps & basins, weir & dewatering tanks, and chemical treatment.

FDEP General Permit for Dewatering requires that you be how many feet from a "known contamination source?" 500 feet or greater

What tools can be used by the permit applicant to determine the cleanup and restoration status of a known contamination site? The Contamination Locator Map (CLM) and the Institutional Controls Registry Web Viewer.

What must the permittee do if the discharge from their dewatering notices the presence of a pollutant or pollutants such as a sheen, or odor? Cease operations immediately, contact their DEP District Ground Water Section for guidance, and contact the 24 Hour Reporting – State Warning Point.

When using chemical treatment systems, what should you remember? "The right chemical at the right dosage."

What two are the most common and approved flocculant chemicals utilized to control turbidity on a job site to reduce turbidity? Anionic Polyacrylamide (PAM) and Aluminum Sulfate (Alum).

Before discharging chemically treated water, what should you test for? pH and turbidity limits.

Chapter 6 – Regulatory and Statutory Requirements

The US EPA authorized Florida to implement the NPDES in what year: 1972/ 1999/ **2000/** or 2007?

The NPDES Generic Permit for Florida in the phase II implemented was effective on this year: 1979/2001/2005/**2015**?

A Large Construction activity results in disturbing **five** acres or more total land area.

What is a construction activity? Building a LEGO city/ **clearing pine trees and burning them/** building a garden shed behind your house/ and replacing windows and doors in your home?

A road is a type of linear project? **True** or False

Obtaining permit coverage is the responsibility of the: engineering firm/FDOT/ subcontractor/ **the Operator.**

The person, firm, contractor, public organization, or other legal entity responsible for construction is known as the: boss/ **operator/** serve party/ improvement board?

What should be the Operator's first step? Submit the NOI/ develop the perimeter fencing around the area to be disturbed/ **develop the SWPPP?**

You can now complete and submit the NOI application and fee electronically? **True** or False.

After getting the NOI and the acknowledgement letter you can start clearing land? True or **False – Must wait 48 hours!**

What do you do with the NOI once you receive it? You can file it/ send a copy to the inspector/ put it in the garbage can DEP has a copy/**post on the job board.**

The CGP permit will allow you to do the following: Fill a wetland area/ dump construction debris/ cause a water quality violation / **perform construction activity.**

Chapter 7 - SWPPP

The Qualified Inspector is anyone who has: Read the CGP/ writes a SWPPP/ paid the fee for the permit/ passed the FSESCI class.

Once your site has achieved final stabilization of 70% or greater you have how many calendar days to submit an NOI? 7, 10, 14, 21

You can you transfer your NOI to a new contractor. True or False

If a BMP is not performing what should you do? Replace the BMP with an alternate BMP/ wait for the engineer or superintendent to fix / call DEP and ask for help.

You must keep all your field inspections, SWPPP, photos, and updated SWPPP for potential review for how long? Five years, 10 years, one year, three years.

Chapter 8 – BMPs for Stormwater Management

When clearing a site and preparing for fill, tree and root debris should be (burned and buried under fill / **removed from the fill area**)

Pipes and structures can be damaged by heavy compactors and should be backfilled and compacted in small lifts with small compactors (**T** / F)

A **retention basin** is designed to retain stormwater on site and allow time for percolation into the ground.

When constructing a retention basin with heavy equipment, special care must be taken to avoid excessive **compaction** of surface soils, especially in the basin floor.

Storage volume must be recovered within **72 hrs.**

The purpose of a **detention basin** is to temporarily store runoff and release it at a controlled rate.

All inlets, outlets, and other control structures should be inspected when? **Weekly and after each major storm event.**

By definition a swale should have side slopes no steeper **3:1.**

A swale is a good place to recycle yard debris since it's organic. (True / **False**).

A **stormwater conveyance channel** is a permanent, designed waterway; shaped and lined with appropriate material (erosion resistant): to safely conduct (convey) runoff away from a developing area.

The purpose of a paved flume is to safely conduct runoff down the face of a slope. (**T** / F)

The purpose of a diversion is to direct stormwater to a stabilized area. (**T** / F)

The maximum spacing between check dams should be such that the **bottom(toe)** of the upstream dam is at **same** elevation as the top of the downstream dam.

Sediments should be removed before they reach **half** of the original height of the dam.

An **outlet protection device** is designed to prevent scour at outlets and minimize erosion downstream by reducing the velocity of concentrated stormwater flows.

The three purposes for riprap are: **protect soil surface from erosion, slow the velocity of flow, and stabilize slopes.**

When placing **riprap** over geotextile great care must be taken to avoid damaging the geotextile while placing the stone.

Chapter 9 – Inspection and Enforcement

In addition to technical knowledge, the inspector must be able to effectively deal with **people**.

In dealing with the public it is most important to follow proper procedures, and to always be **courteous and fair**.

The erosion and sediment control rules are **performance oriented**. This means that the BMPs must be **effective** in controlling erosion and preventing off-site sedimentation for the site to be in compliance.

Off-site sedimentation is excusable only if all BMPs have been installed per an approved plan (True/ **False**).

Inspector's job is to:

Determine that an erosion and sediment control plan has been approved (permitted). Determine that all BMPs are properly installed and maintained per plan. Determine that off-site sedimentation is being prevented. Turbidity is being prevented.

Additional Information:

If I pass this exam today, my certificate of qualification as a “Qualified Inspector” does it require CEUs every three years to stay qualified? (Yes / **No**)

The certificate of qualification as a “Qualified Inspector” does it ever expire? (Yes / **No**)

This certificate is only good as a “Qualified Inspector” in which southeast states? (Mississippi, Alabama, Georgia, Tennessee, South Carolina, **Florida**)

If you pass this exam you can go and start doing inspections immediately. (**True**/ False)

Generally, it may take up to six weeks if not sooner to receive your certificate in the mail if you provided a reliable mailing address including any apartment numbers or suite numbers. (**True**/ False)

Thank you all for attending our class. We hope this will only be the start of your interest in learning more about sediment and erosion control and water pollution control in general. We appreciate your help in properly applying your knowledge to preventing water pollution.