LEXINGTON

Construction Site Erosion, Sediment, and Stormwater Management

Division of Water Quality Projects
LFUCG Capital Projects
Remedial Measures Project Sites
Residential and Commercial Construction

Barry Tonning
Tetra Tech

Workshop agenda

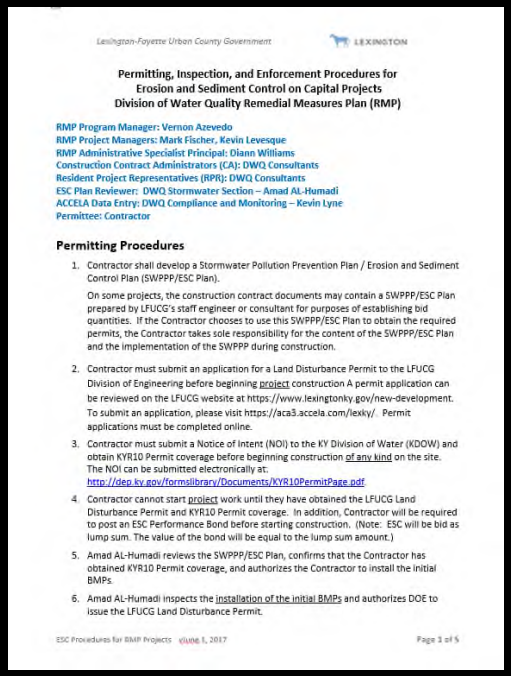
- Review of permitting and site inspection procedures
- Basic erosion, sediment, and stormwater controls
- Chapter 11 of the LFUCG Stormwater Manual
- Handout on BMP details
- Other available resources

Communication is key!

- Division of Engineering
  - Evaluates SWPPP/ESC Plan
  - Issues Land Disturbance Permits
  - Checks for compliance with city engineering requirements
- Division of Water Quality
  - Evaluates DWQ Capital Project SWPPP/ESC Plans
  - Approves & inspects initial BMPs
  - Authorizes issuance of Land Disturbance Permit
  - Monitors site during construction
  - Ensures project is built to standards

Permitting and site inspection

- General approach:
  - SWPPP is prepared (contractor or LFUCG)
  - SWPPP is reviewed by LFUCG
  - After acceptance, initial BMPs are installed at the construction site
  - Initial BMPs are inspected by LFUCG
  - Upon approval, site work can begin
  - Contractor must install BMPs as needed
  - Contractor most follow/amend SWPPP
  - Inspections & written reports required
  - Enforcement via LFUCG inspections, NOVs, Citations, Stop Work Orders, or contract penalties



Lexington-Fayette Urban County Government — LEXINGTON

Permitting, Inspection, and Enforcement Procedures for Erosion and Sediment Control on Capital Projects Division of Water Quality Remedial Measures Plan (RMP)

RMP Program Manager: Vernon Azevedo
RMP Project Managers: Mark Fischer, Kevin Levesque
RMP Administrative Specialist Principal: Diann Williams
Construction Contract Administrators (CA): DWQ Consultants
Resident Project Representatives (RPR): DWQ Consultants
ESC Plan Reviewer: DWQ Stormwater Section – Amad AL-Humadi
ACCELA Data Entry: DWQ Compliance and Monitoring – Kevin Lyne
Permittee: Contractor

Permitting Procedures

1. Contractor shall develop a Stormwater Pollution Prevention Plan / Erosion and Sediment Control Plan (SWPPP/ESC Plan).

   On some projects, the construction contract documents may contain a SWPPP/ESC Plan prepared by LFUCG's staff engineer or consultant for purposes of establishing bid quantities. If the Contractor chooses to use this SWPPP/ESC Plan to obtain the required permits, the Contractor takes sole responsibility for the content of the SWPPP/ESC Plan and the implementation of the SWPPP during construction.

2. Contractor must submit an application for a Land Disturbance Permit to the LFUCG Division of Engineering before beginning project construction A permit application can be reviewed on the LFUCG website at https://www.lexingtonky.gov/new-development. To submit an application, please visit https://aca3.accela.com/lexky/. Permit applications must be completed online.
3. Contractor must submit a Notice of Intent (NOI) to the KY Division of Water (KDOW) and obtain KYR10 Permit coverage before beginning construction of any kind on the site. The NOI can be submitted electronically at: http://dep.ky.gov/formslibrary/Documents/KYR10PermitPage.pdf.
4. Contractor cannot start project work until they have obtained the LFUCG Land Disturbance Permit and KYR10 Permit coverage. In addition, Contractor will be required to post an ESC Performance Bond before starting construction. (Note: ESC will be bid as lump sum. The value of the bond will be equal to the lump sum amount.)
5. Amad AL-Humadi reviews the SWPPP/ESC Plan, confirms that the Contractor has obtained KYR10 Permit coverage, and authorizes the Contractor to install the initial BMPs.
6. Amad AL-Humadi inspects the installation of the initial BMPs and authorizes DOE to issue the LFUCG Land Disturbance Permit.

ESC Procedures for BMP Projects Volume 1, 2017 — Page 1 of 5

Common challenges for construction project sites

- Erosion control plan / stormwater pollution prevention plan (ESC / SWPPP) sometimes does not provide sufficient direction to field personnel.

Erosion & sediment control plans

- Required components include:
  - Project description, topography, soils, drainage
  - Land use/cover of adjacent property
  - Work schedule, sequence of grading, etc.
  - List of ESC BMPs, location, schedule
  - Housekeeping measures
  - Inspection and maintenance activities
  - Site map showing disturbed areas, entrance, streams, wetlands, sinkholes, basins, ponds, infrastructure
- Must meet requirements of Stormwater Manual
- Must be implemented by the permittee
- Permittee must inspect site, maintain records

ESC Plan Review

Look over the ESC Plan Review Checklist to ensure that the required items are included

LFUCG Erosion and Sediment Control Plan Checklist vFeb2017

Owner/Developer (Permittee) Name:	Date:
Contact Person:	Contact Phone:
Site Address:	Zone:
Contractor Name:	Contractor Phone:
Mailing Address:	Email:

Permitting Information and ESC Plan Narrative	Yes	No	N/A	Page#	Notes
KY DOW Construction NOI / KYR10 Permit					Required for disturbance ≥ 1 acre
US ACE Section 404 Permit					Required for stream crossings, wetland fills
KY DOW Stream Construction Permit / WQ Certif.					Required for stream crossings / encroachment
FEMA LOMR or CLOMR					If applicable
Project description and purpose					Brief summary
Land cover, soils, percent impervious area					Pre and post construction
Land cover / land use of adjacent property					Can designate on plan sheets
Work schedule with start/end dates					Sequencing, clearing, grading, revegetation
Phasing plan for large projects					25 acre limit on total disturbed area
BMP installation schedule					Can be included on plan sheets (see below)
Inspection and BMP maintenance schedule					Every 7 days, or every 14 days and after ½" rain
Material storage pollution prevention measures					Covered, away from drainage system, etc.
Fueling / vehicle maintenance pollution prevention					Conducted away from drainage system, etc.
Spill prevention, control, and countermeasures					If reportable quantities present at the site
Dust control plan					Consider if neighbors are present
Site exit inspection plan					For keeping offsite pavement clear of soil/debris
Stabilization plan and schedule for site areas					Seed/mulch/etc. within 14 days of inactivity
ESC Plan Site Map and Drawing Detail *(See LFUCG Stormwater Manual for BMP Design and Installation Information)*					
Plans stamped by a licensed professional					Required for engineered plan components
Location of the project; property lines					Include small locational map; street address
Limits of construction, disturbed area location/size					Flag off "no disturbance" areas
Topography and drainage patterns (pre and post)					1" = 50 ft; 2 ft contours
Buildings, utilities, paved areas, ditches, culverts					Show stormwater inlets within 100 ft of site
Retention ponds, detention basins, sediment traps					Stabilize immediately after construction
Access and haul roads					Consider dust control where neighbors present
Stabilized exit (50 ft #2 rock pad, shaker rack, etc.)					Must drain to a sediment control BMP
Silt fence or etc. at downslope perimeters					Super silt fence along critical areas
Diversion ditches/berms above disturbed areas					Stabilize immediately after construction
Protection for post-construction BMPs					Keep sediment out of post-construction BMPs
Slope stabilization (seed with mulch/blanket/mat)					See Figure 11-1 in Stormwater Manual
Inlet protection measures					Specify type(s) and location(s)
Outlet erosion protection measures					Specify type(s) and location(s)
Ditch stabilization (sod, or seed with blanket/mat)					Stabilize immediately after construction
Sediment basins (> 5 ac) and traps (< 5 ac)					Stabilize immediately after construction
Dewatering sites and methods					Must use sediment controls
50 ft natural vegetated buffer for all critical areas					Applies to streams, wetlands, sinkholes
Stream crossings					Crossing type, detail; USACE 404 permit req'd
Stockpile areas, equipment storage/fueling areas					Keep away from drainage system if possible
Concrete washout area(s)					Show initial area; can be moved as needed

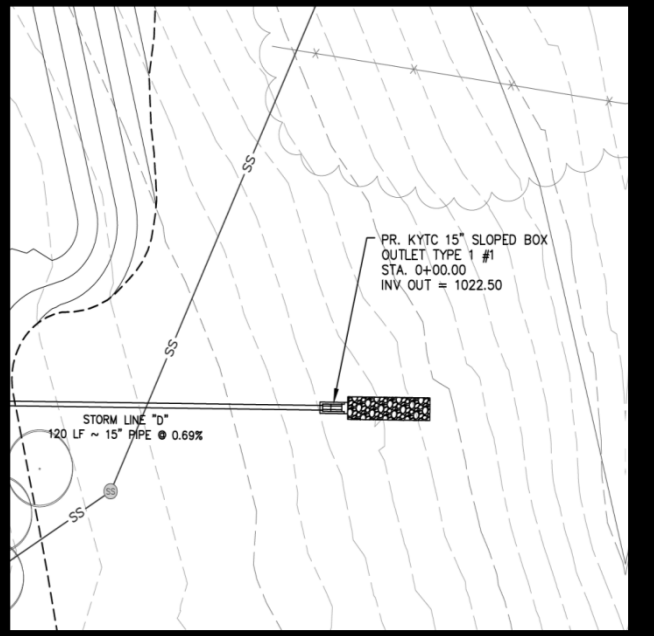
LFUCG Use Only: Review Date: *Status – In Compliance:* *Yes* *No* *Additional Info Needed:* *Yes* *No*

Reviewed By: *Department:* *DOE* *DWQ* *DES*

Comments / Missing Items:

Understanding basic ESC plans

- Note general slopes and drainage patterns across the site
- Look for downhill sheet flow sediment controls (silt fence, etc.)
- Identify concentrated flow area ditch checks, sed traps, etc.
- Look for curb/drop inlet locations
- Note schedule, etc. for sed. ponds
- Review standard notes for stabilization and other conditions
- Identify and investigate any post-construction BMPs in the plans



ESC Plans: Standard Notes

- Stabilization (after 14 inactive days, or immediately for ditches, traps, basins)
- Keeping public roads clean (daily)
- Use of blankets/mats (ditches, channels, slopes)
- Downslope protection / cover for soil stockpiles
- Covers/etc. for pollutant-leaching materials
- Keeping records at site (permits posted, ESC Plan and inspection reports available)
- Schedule for ESC BMP inspections (weekly or every 14 days AND after ½" of rain)
- BMP maintenance (sed removal, etc.)
- Removing temporary BMPs (silt fence, rock checks, etc.) as needed and upon project completion

Top Five Shortcomings of ESC Plans

- Ditches don't call for sod/blanket/mat stabilization
- Unreinforced silt fence spec'd for low corners, dips, channels
- Lack of complete direction on site stabilization, scheduling
- No info on BMP installation, maintenance, inspection
- Confusing info on permittee, site contact, site address

Two notable field guidelines:

- If it's on the plan, it must be in the field
- If it's in the field, it must be maintained

Common challenges for Fayette County construction sites

- Land disturbance & other permits not posted as required by LFUCG ordinances.

ESC plan, permits, inspections

- Land Disturbance & KDOW KYR10* Permits must be posted
- ESC and other plans must be available for review
- Inspection reports with inspector's name, date, etc. must be up to date & available

**Projects on sites > 1 acre must comply with KDOW KYR10 permit!*

Common challenges for local construction project sites

- Inspection reports don't reflect actual site conditions

LFUCG inspection requirements

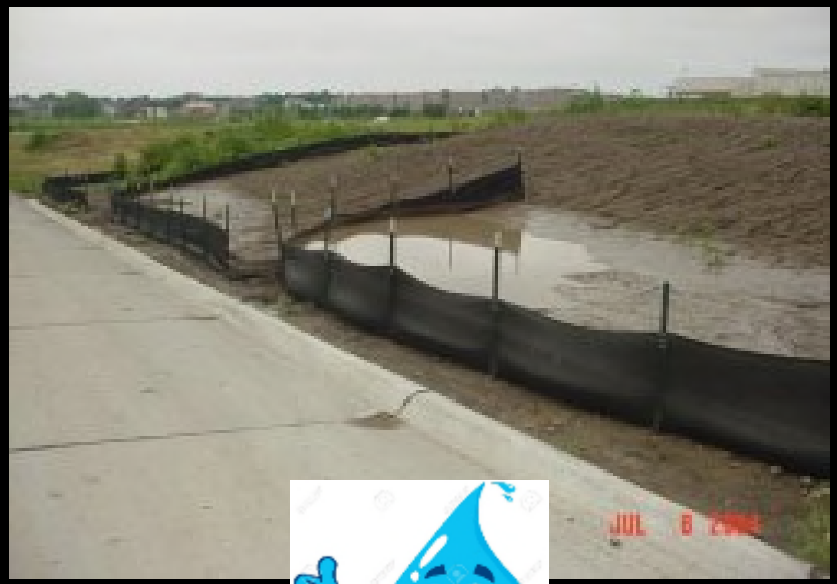
Stormwater Manual, Sec. 11.2.1:

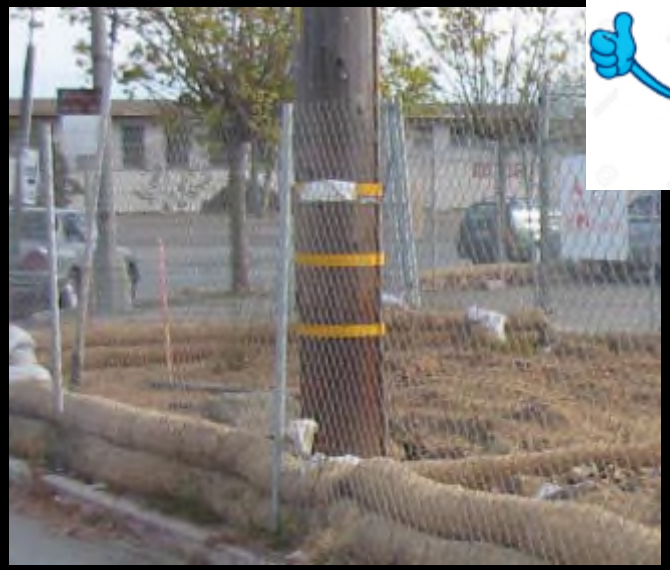
- Inspection and Notification Requirements
  - *The permittee shall make regular inspections of all control measures . . . to determine the overall effectiveness of the erosion control plan and the need for maintenance and/or additional control measures (including) any actions taken as a result of the inspection*

Common challenges for construction project sites

- Downslope perimeter controls don't adequately contain sediment
  - Too much incoming flow
  - Poor installation
  - No maintenance

Control the downslope perimeter





Which sediment barrier?

- Fiber roll (logs, wattles, etc.)
  - Slopes less than 5%
  - Slope length less than 50’
- Regular silt fence
  - Slopes less than 15%
  - Slope length less than 100 ft
- Super silt fence
  - Up to 100% (1H:1V) slopes
  - 50 to 100 ft apart, based on slope
  - Use to protect critical areas

**Stabilize slopes immediately*

Discussion Photos:

Focusing on Concentrated Flows Leaving the Site

- What's good? What's not? Any suggestions?

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Common challenges for construction project sites

- Project footprint (bare soil area) is too big – no ongoing stabilization

Effects of seed vs no seed, and slope length

Stabilization prevents erosion

Final grade and stabilize ASAP

Blankets and Mats: The Basics:

- **Erosion control blankets** – thin, designed to decompose after a given time
- **Turf reinforcement mats** – thicker, designed to last more than 15-20 years

Common challenges for construction project sites

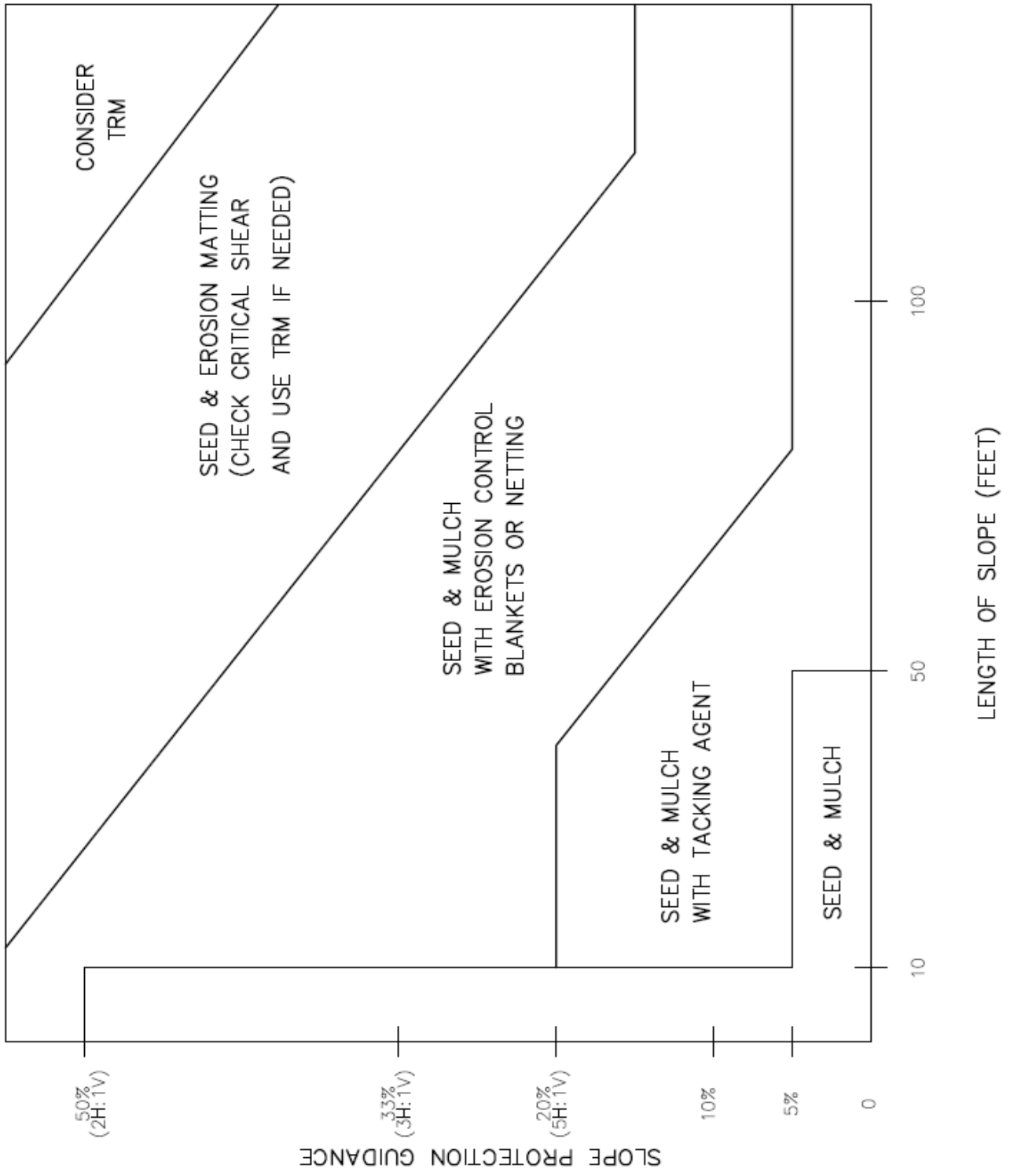
- Poor protection for steep, long slopes
  - Erosion control blankets or turf reinforcement mats are needed (see Chapter 11 of the Stormwater Manual)

STORMWATER MANUAL

FIGURE 11–1

SLOPE PROTECTION GUIDANCE

(OCTOBER 1, 2016)



Common challenges for construction project sites

- Failure to install and maintain storm drain inlet protection

Inlet protection

- Must be installed
- Must be functional
- Must be maintained
- Must be removed when the project is complete

Inlet protection approaches


Arts Rental

Your best friend in close quarters

- The Rock Bag
  - They're cheap
  - They're simple
  - Inlet protection
  - Ditch checks
  - Use to divert incoming clean flows
  - Divert muddy flows to a sediment trap
  - Make berms for a small sediment trap
  - They're reusable

Common challenges for construction project sites

- Ditches are not stabilized after they're constructed

Common challenges for construction project sites

- Soil stockpiles in street, not covered during rain

Soil stockpile management

- Small piles – cover with tarp
- Large piles – tarp, mulch, seeding
- Perimeter control – silt fence, fiber logs
- Place pile at best upgradient location
- No stockpiles near drainage system!

Common challenges for construction project sites

- Stream crossings are poorly designed or constructed,
  not stabilized

Temporary equipment crossings

- Minimize footprint
- Size culvert(s) for flow
- Low point in middle (designed blow out)
- Use rock for cover/fill
- Use silt fence along banks
- Remove as soon as possible

Crossing streams and tributaries

- Try to get in and get out as quick as you can
- Be ready to backfill, seed, mulch, or stabilize immediately
- Always use blankets or mats on stream banks
- Use rock berms / check dams on incoming flows

Trenching across creeks

- Keep soil stockpiles, lubricants, concrete washout, & materials away from channel
- Use temporary dams and diversions, or use pump-arounds as needed
- Do not remove large trees
- Minimize vegetation removal
- Revegetate stream banks as quickly as possible after construction

Finishing the stream crossing

- Grade banks & staging area
- Protect slopes with turf mats or erosion control blankets
- Revegetate banks, staging, & other areas quickly
- Use native trees, shrubs, grasses – or match surrounding vegetation

Common challenges for construction project sites

- Neglect of good housekeeping practices
  - Dirt in the street
  - Trash and litter
  - Concrete washout
  - Material storage
  - Waste management

Trackout prevention at site exit

- Biggest complaint source
- Pavement must be clean!
- Minor staining OK

Concrete washouts

- Must be noted in ESC Plan / SWPPP
- Locational sign required
- Bales, wood, berms, etc.
- Leakproof, 10 mil thick
- 25’ from drains, 50’ from water
- Rock pad leading to washout
- 14 days to repair leaks, replace @ 90% full
- Remove pad and washout prior to site closeout

Waste management

Excavation site conditions at final project completion include:

- Site is stabilized
- Temporary BMPs have been removed
- Drainage system is stable
- Final housekeeping tasks are completed

Site stabilization closeout

- No large patches or areas of bare soil visible – or dead vegetation – within the site
- At least 70 percent uniform vegetated cover is established in all vegetated areas
- Slopes are stable, with no significant rills/ruts
- Sodded areas are established and green, with no large dead areas or slipping
- No large bulges or loose areas should be visible in netting or other rolled erosion products

Drainage system closeout

- Stormwater pipes, ditches, curbs, etc. checked for consistency with design plans
- Manholes, pipes, catch basins, headwalls, and concrete flumes checked for alignment, integrity, etc.
- No significant sediment accumulations in pipes, ditches, and catch basins
- Ditches/swales/channels are well-vegetated, rip-rapped, paved, or otherwise stabilized, with no large areas of bare soil or active erosion visible

Temporary BMP removal includes:

- Silt fencing, posts, and accumulated sediment
- Non-degradable sediment barriers
- Inlet protection devices (rock, rock bags, fabric wrapped pipe, filter fabric, etc.)
- Ditch checks (rock, rock bags, dams, etc.)
- Temporary rock or other berms
- Temporary sediment traps, accumulated sediment
- Temporary sediment basins, accumulated sediment
- Waste and other containers
- Concrete washouts and any concrete waste
- Stabilized construction exits

Good housekeeping closeout

- Litter and trash pickup / cleanup over entire site
- Removal of debris and waste piles
- Removal of fuel tanks and other fueling and maintenance items and equipment
- Removal of signs, barriers, flagging, etc.
- Removal of construction phase supplies, materials, and stockpiles
- Stabilization of material storage, staging, and other areas (e.g., 70 percent vegetative cover)

And now, it’s time to play . . .

True or False!

True or False?

- ESC plans are required to have a schedule for the inspection of BMPs identified in the plan.

True!

- **Stormwater Manual**

  11.3.5 O&M Plan

  – *An operation and maintenance (O & M) plan shall be developed which provides a schedule for inspection, maintenance, and repair of BMPs during construction activities.*

True or False?

- In order to meet site stabilization requirements, at least 85% of the site must be either vegetated or covered by roads, sidewalks, parking, lots, buildings, mulch, etc.

False!

- **Stormwater Manual**
- 11.4.3 Permanent Seed
  - *Areas requiring additional seed and mulch shall be repaired within 48 hours. If vegetative cover is not established within 21 days, the area shall be reseeded. If **less than 70 percent groundcover** is established, seed and fertilize, using half of rates originally applied, and mulch.*

True or False?

- Silt fence posts can be spaced out up to 10 feet, depending on the type of silt fence fabric and posts being used.

False!

- **Stormwater Manual**
- 11.5.4 Silt Fence
  - *Posts shall be spaced a maximum of 6 feet apart at the barrier location and driven securely into the ground (minimum of 12 inches).*

True or False?

- Dust control for construction roads is technically optional, even during dusty conditions.

False!

- **Stormwater Manual**
- 11.4.7 Dust Control
  - *Construction roads shall be watered as needed to minimize dust.*

True or False?

- Construction entrances must be inspected twice a day by city ordinance.

False!

- **Stormwater Manual**
- 11.4.6 Construction Entrance
- *The stabilized construction entrance shall be inspected once each week and after there has been a high volume of traffic or a storm event greater than 0.5 inches.*

Regulatory Basis for LFUCG Construction Site Stormwater Compliance Program

The following list of construction site requirements was derived from regulatory and guidance documents governing stormwater management on active construction sites in Fayette County, Kentucky. The following key indicates the regulatory basis for each inspection focus parameter. Note that LFUCG ordinances at Chapter 16, Article X, Division 5 incorporate KY Division of Water construction site stormwater KDPES permit requirements by reference.

- ESCO = *Erosion and Sediment Control Ordinance*, Chapter 16, Article X, Division 5
- SM = LFUCG *Stormwater Manual*
- CIM = LFUCG Capital Projects *Construction Inspection Manual*
- KYR10 = KY Division of Water *KPDES General Permit* for Construction Stormwater

Permit Coverage Requirements

Sites 5,000 sq ft to one acre and linear construction projects that are less than one acre must be covered by a Land Disturbance Permit and an Erosion and Sediment Control Plan. (ESCO: Sec. 16-101, Sec. 16-102)

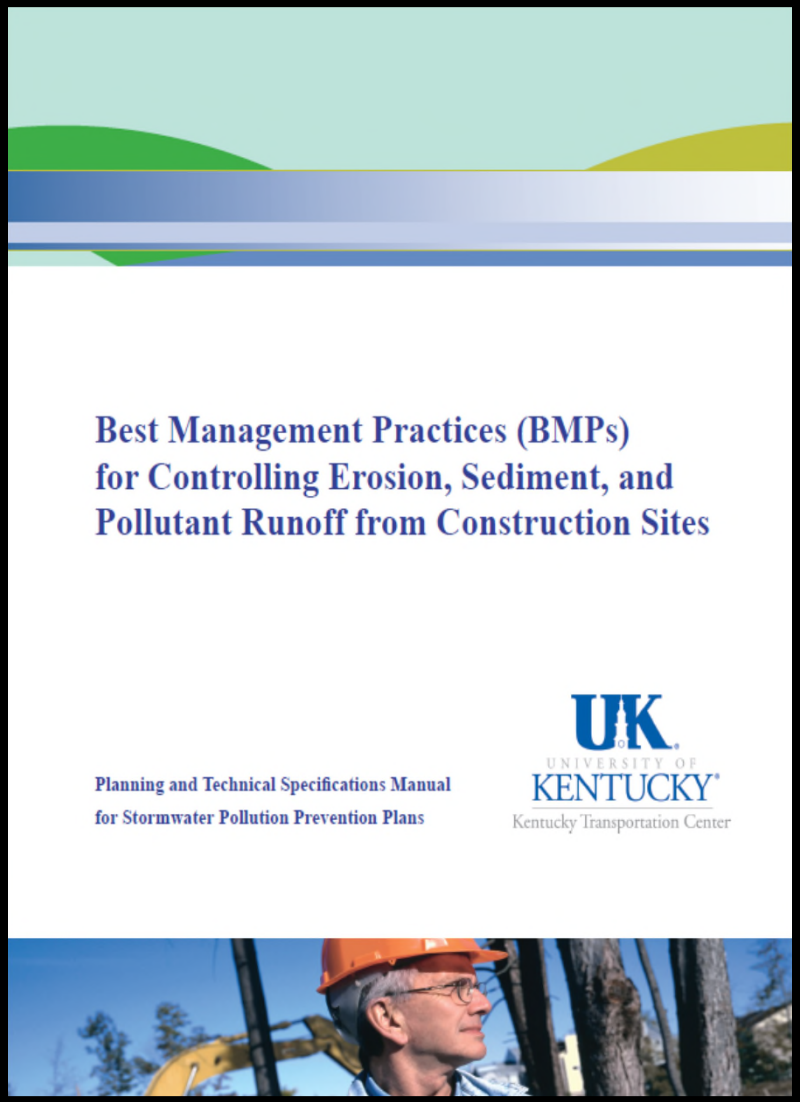
Sites with a disturbed area of one acre or more, and those of less than one acre within a common plan of development of more than one acre, must be covered by an LFUCG Land Disturbance Permit, an individual or general (i.e., KYR10) KY Division of Water Construction Site Stormwater Permit, and a Stormwater Pollution Prevention Plan. (ESCO: Sec. 16-101, Sec. 16-102. KYR10: Sec. 1.1)

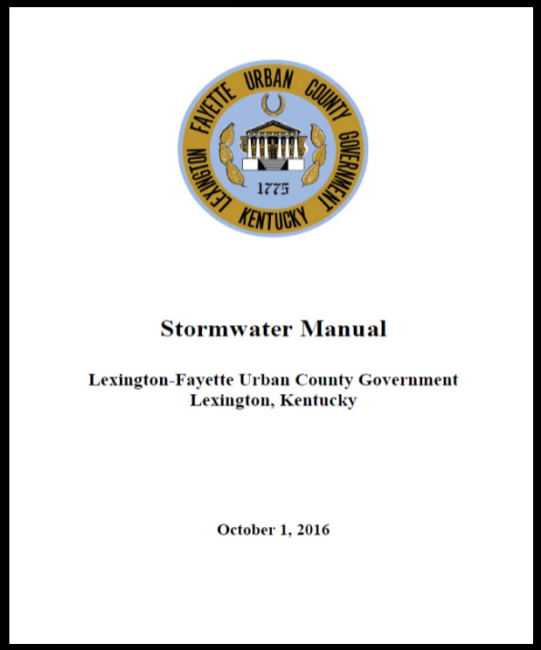
Construction site requirements established by the KY Division of Water, US Army Corps of Engineers, and US EPA are also required by LFUCG. (ESCO: Sec. 16-104. SM: Sec. 1.4.2, Sec. 2.5, Sec. 11.2.4, Sec. 11.5.7)

Inspections of the Site and Permittee Records

Site inspections are required once every 7 days, or once every 14 days and within 24 hours of any storm event of 0.5 inches or greater. Inspectors must be knowledgeable and skilled in assessing site conditions and effectiveness of management practices. The report shall list a description of each area inspected, the

http://www.kyt2.com/training/program/ky-erosion-prevention-sediment-control-kepsc





Thank You