
Contractor's Handbook
for Erosion, Sediment, and Stormwater Management
on Capital Project Construction Sites

*Lexington-Fayette
Urban County Government*



August 2019



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Management on Capital Project Construction Sites*

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This publication was developed by the Tetra Tech / Third Rock Consultants Stormwater Program Management Team under contract to LFUCG for purposes of implementing the stormwater provisions of its Clean Water Act Consent Decree and/or its Kentucky Division of Water (KDOW) Municipal Separate Storm Sewer System (MS4) Permit.

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Photos and diagrams used in this handbook were provided by Tetra Tech and construction industry materials suppliers.

Kentucky Environmental Emergency Hotline

Spills •• Hazardous Materials •• Discharges to Water •• Hazardous Air Discharges

Hotline Number for Reporting an Environmental Emergency

24 hours a day, 7 days a week – call:

800-928-2380 or 502-564-2380

The Kentucky Environmental Response Team (ERT) responds to spills and other environmental emergencies. Contact the ERT when an actual spill or release of a hazardous material occurs, or when there appears to be a threat of a severe environmental harm. Environmental damage can sometimes be reduced by a quick response and application of appropriate cleanup techniques.

You must report spills or releases if you possess or control:

- Petroleum or petroleum products. Reportable quantities are 25 gallons or more of a petroleum product within a 24-hour period and 75 gallons or more of diesel fuel in a 24-hour period or any amount that creates a visible sheen on surface waters. (KRS 224 01-400)
- Hazardous substances, as listed under the federal Comprehensive Environmental Response Compensation and Liability Act (CERCLA) of 1980, as amended.
- Extremely hazardous substances designated under Title III of the Superfund Amendments and Reauthorization Act (SARA) of 1986.
- Nerve and blister agents designated under state law.
- Pollutants or contaminants or any materials that – when released into the environment – may present an imminent or substantial danger to the public health or welfare. (KRS 224.01-400)

Anyone who witnesses a "spill" or "release" of any of the materials mentioned above should immediately call ERT to ensure that the spill is remediated properly.

Also, if you believe the spill, release, or emergency poses a threat to the public:

Call 911, then 311

And then call the ERT number above.

Failing to report a release can result in fines of up to \$25,000 per day per violation.



LEXINGTON

Lexington-Fayette Urban County Government

Contact Information for Capital Project Construction Issues

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Kentucky Statewide Spill Reporting and Response

Kentucky Environmental Emergency Hotline 24/7
(800) 928-2380 or (502) 564-2380

Summary of Requirements

This handbook is intended to help capital project construction contractors in Fayette County, Kentucky, comply with local and state erosion, sediment, and stormwater management requirements. Regulatory and other information included in the handbook comes from:

- Lexington-Fayette Urban County Government (LFUCG) ordinances;
- the LFUCG Stormwater Manual and the city's other engineering manuals;
- the Consent Decree between LFUCG, KDOW, and the U.S. Environmental Protection Agency; and
- the city's Kentucky Division of Water (KDOW) discharge permit for its Municipal Separate Storm Sewer System (MS4).

While the information in this handbook is tailored specifically for capital project contractors, the regulatory requirements, planning and permitting procedures, site management practices, and other contents can be easily applied to other construction projects in Fayette County. It should be noted that **the overall goal of the requirements, procedures, and practices in this handbook is keeping sediment and other pollutants out of the storm drain system and out of local creeks, wetlands, and sinkholes.** The steps to accomplish that goal include a wide range of pollution prevention, erosion control, sediment management, and good housekeeping practices, as detailed in this handbook.

Types of LFUCG Capital Projects

Lexington engages in a variety of capital construction projects that may impact stormwater runoff. New and expanded public buildings, sewer line repair and replacement, sidewalk construction, installation of pump stations and wet weather storage tanks, drainage improvements, park projects, walking/biking trail development, and road work typically expose soil and other pollutants to rain storms and snowmelt. Keeping sediment, fuel, oil, grease, paint and concrete wash water, and wastes, litter, and debris out of local waterways during capital project construction is both a regulatory requirement and an important way for the city to demonstrate the high standards expected at all construction sites.

Federal Consent Decree and the MS4 Permit

The Federal Consent Decree is a legal agreement between the city, state, and federal government to fix problems with Lexington's stormwater and sanitary sewer systems by 2026. The initial lawsuit – alleging noncompliance with the Clean Water Act – was filed by the U.S. Environmental Protection Agency and the Commonwealth of Kentucky in 2006, and the Consent Decree was finalized in 2011. It requires the study, design, and implementation of numerous construction projects to upgrade the sanitary sewer system and to improve Lexington's stormwater system. The agreement also requires Lexington to make operational and managerial changes, such as construction oversight and enforcement, to prevent future problems. The requirements for construction sites include:

- Site inspection and enforcement procedures;
- Tracking active sites, and inspecting 90% of them monthly;
- Conducting annual training for site inspectors;
- Only counting inspections conducted by trained staff

More information on the Consent Decree is available at <https://www.lexingtonky.gov/consent-decree>.

The city's MS4 permit, issued by KDOW, also contains detailed requirements on how Lexington must inspect and oversee construction sites. The permit, which authorizes stormwater discharges to public waterways in the county, is enforceable through fines, penalties, and possible imprisonment for violations. Permit provisions mandate that the city:

- Update, implement, and enforce the construction site runoff control program
- Implement staff training and periodic program evaluations
- Conduct summary reviews of erosion and sediment control (ESC) plans
- Conduct targeted and regular inspections of construction sites
- Inspect at least 70% of all construction sites every month
- Inspect 70% of the targeted construction sites twice every month
- Maintain and update city construction site ordinances, procedures, Stormwater Manual requirements, the ESC Plan checklist, and applicable inspection and enforcement procedures

Additional information on the MS4 permit is posted at <https://www.lexingtonky.gov/stormwater>.

City Ordinance Requirements for Construction Sites

The most detailed list of requirements for construction sites in Fayette County can be found in Chapter 16, Article X, Division 5 of the LFUCG Code of Ordinances, and in Chapter 11 of the city's Stormwater Manual, which is incorporated into ordinance requirements by reference (see web links on Page 48). This handbook contains summarized information derived from the ordinances and the Stormwater Manual, which lists the following key requirements for construction sites:

- Land disturbance permits are required for most sites larger than 5,000 square feet.
- Erosion and sediment control plans are required prior to obtaining a Land Disturbance Permit.
- Construction activities must comply with the requirements listed in the Stormwater Manual.
- LDP permittees must regularly inspect their sites, and keep records of the inspection reports.
- Inspection reports must determine the overall effectiveness of the erosion control plan and the need for maintenance and/or additional control measures.

Erosion and Sediment Control Plans

Erosion and Sediment Control plans are required by city ordinances codified at Chapter 16, Article X, Division 5, Section 16-101 to 16-105. ESC Plans are reviewed by the Division of Engineering, and used by inspectors to ensure that proposed measures to manage pollutants in stormwater runoff are installed and maintained appropriately. ESC Plans must contain erosion, sediment, and stormwater "best management practices" (BMPs) that are reasonable and effective for minimizing impacts of stormwater runoff. Engineered elements of the ESC Plan must be designed by a licensed Kentucky Professional Engineer, and the plans must be consistent with the Stormwater Manual and LFUCG's Standard Drawings. ESC Plans must include:

- A description of the project and the site, including topography, land cover, grading plans, etc.
- A list of pollutant sources, such as sediment, concrete wash water, solid waste, and so on.
- BMPs for managing erosion, sediment movement, and pollutants in stormwater runoff.
- Requirements for inspecting the site, documenting the findings, and addressing problems.
- Provisions to ensure that subcontractors adhere to the ESC Plan requirements.

Local, State, and Federal Permits

Capital projects in Lexington may require additional permits – i.e., besides the Land Disturbance Permit issued by the Division of Engineering. For example, a sewer line project that requires trenching across an intermittent or perennial stream will require coverage under a Clean Water Act Section 404 permit, issued by the U.S. Army Corps of Engineers (US ACE). Permits issued by US ACE typically need a Clean Water Act Section 401 Water Quality Certification from the Kentucky Division of Water (KDOW). If the project results in the disturbance of more than one acre, coverage under the KDOW Construction General Permit – also known as KYR10 – is needed as well. Contractors are responsible for identifying, applying for, and securing all permits required for capital project construction.

Construction Site Best Management Practices

The BMPs installed or applied to reduce erosion, sediment loss, and pollutant runoff are the heart and soul of the site management program. The basic approach for keeping pollutants onsite includes:

- Planning considerations that minimize the size of the bare soil area and the length of time disturbed areas are exposed to the elements – especially for long, steep slopes.
- Diverting or otherwise controlling the location and volume of run-on flows to the site.
- Covering bare soil as soon as possible with seed, mulch, erosion control blankets, turf reinforcement mats, gravel, rock, plastic sheeting, soil binder chemicals, etc.
- Intercepting sediment-laden sheet flow runoff with silt fencing or other sediment barriers.
- Using sediment traps or ponds to remove sediment from concentrated flows.
- Protecting stormwater inlets with sediment barriers (e.g., rock bags, dikes) or filter fabric.
- Ensuring that ditches and channels are stabilized with vegetation, rock, or other armoring.
- Cleaning up spills and repairing leaks as soon as they are discovered.
- Keeping fuel, oil, wastes, pollutants, and materials that may leach pollutants away from the stormwater drainage system and properly contained or covered.

Erosion and Sediment Control Plans

Erosion and sediment control plans are developed prior to applying for a Land Disturbance Permit, and are submitted with the permit application. By ordinance, ESC Plans must contain BMPs “that are reasonable and effective for minimizing impacts of stormwater runoff.” Engineered components of the plan – such as ditch / channel sizing, sediment pond sizing, etc. – must be designed by a Professional Engineer licensed in Kentucky (see KRS 322.010). All hydrologic, hydraulic, structural, and geotechnical design calculations must be included in the plan. ESC Plans must be consistent with the Stormwater Manual and LFUCG’s Standard Drawings. **It is the sole responsibility of the LDP applicant to ensure the accuracy and completeness of all drawings, calculations, and reports, and to ensure construction feasibility of the BMPs and overall project design.**

The checklist for ESC Plan components can be found on the next page. Plans must be implemented at the construction site, and must be updated with modified or additional BMPs if inspectors find they are not effectively minimizing the impacts of stormwater runoff. More information on ESC Plans and the Land Disturbance Application process can be found at <https://www.lexingtonky.gov/new-development>. The following subsections summarize ESC Plan requirements. Detailed information appears in subsequent sections and in the Appendices (see web links on Page 48).

LFUCG Land Disturbance Permit Application & Erosion and Sediment Control Plan Checklist

v23Feb2018

Permittee (Owner or Contractor):	Date:
Contact Person:	Contact Phone:
Site Address:	Zone:
Contractor Name:	Reg #:
Mailing Address:	Contractor Phone:
	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, waste & litter pollution prevention					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
Stabilized 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
Waste and concrete wash water storage/disposal					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:					

Description of the Project and the Site

The ESC Plan must contain a description of the project and the site, including adjacent areas. The following list of required inclusions comes from the Stormwater Manual and city ordinances:

- Description of the project, including the purpose, location, and size of the disturbed area
- Site map showing areas of disturbance, BMP locations, utilities, pavement, construction entrance(s), streams, wetlands, sinkholes, basins/ponds, culverts, and storm inlets
- Topography, land cover, soils, percent impervious area, before/after site drainage patterns
- Land use and land cover conditions of adjacent properties
- Schedule of work, with beginning/end dates; sequencing (clearing, grading, revegetation)
- Installation schedule, inspection plan, and maintenance procedures for BMPs
- 50-foot natural vegetation buffer must be maintained around streams, wetlands, sinkholes, etc.
- Must minimize the area and time length of any disturbances in the buffer zone
- LFUCG may require ESC Plans to include phasing details for large projects

Pollutants and Their Sources

Pollutants and their sources at typical capital project construction sites may include the following:

- Soil from excavation and trenching operations
- Fuels and oils for vehicles and equipment
- Concrete wash water from concrete delivery trucks and onsite mixers
- Stucco mix, grout, mortar, cement, and concrete sealer for structural work
- Paint, primer, plaster, and drywall compound for structures
- Packaging, litter, and other solid wastes from material deliveries
- Fertilizer and lime used for seeding bare areas at project completion
- Mulch and other landscaping materials used for final stabilization
- Human waste from onsite portable toilets

Best Management Practices

The ESC Plan must include a list of BMPs used to control onsite pollutants, including information on BMP locations, the installation schedule, and rationale for use. While many of the BMPs will be targeted at preventing erosion and controlling sediment migration offsite, housekeeping BMPs to manage non-sediment pollutants are also required. A list of typical BMPs for capital projects may include:

- Upland diversion berms or ditches, to divert clean run-on water away from the site
- Stabilized site exit pad where vehicles enter public roads, usually with #2 rock and geotextile
- Perimeter control silt fencing or other sediment barrier (fiber logs, rock bags, etc.)
- Temporary or permanent seeding for bare areas idle for 14+ days or ready for close-out
- Use of straw or other mulch, erosion control blanket, or turf reinforcement mat over seed
- Protective filters (e.g., filter fabric, rock berms/bags, plastic berms, etc.) for storm drain inlets
- Sediment traps and/or ponds, located where concentrated flows exit disturbed areas
- Stabilized ditches to carry storm flows (e.g., seed with blanket/mat; channel lining)
- Stabilized crossings for intermittent or perennial streams (i.e., with culvert, or on bedrock)
- Housekeeping BMPs to keep pollutants covered, contained, and away from the drainage system

Non-structural BMPs may include planning, scheduling, sequencing, and other directives to the contractor. These can be included on plan sheets as standard notes that address typical construction-related topics, such as:

- Prepare for and plan to execute trenching across streams during dry weather
- Minimize the size of the disturbed area, and minimize the time soil is exposed
- Stabilize inactive bare areas within 14 days after activities cease on that portion of the site
- Remove mud, rock, and debris from public roads as soon as possible, and at least daily
- Stabilize all earthen structures (cuts, fills, ditches, berms, traps, ponds, etc.) immediately
- Cover materials that may leach pollutants until they are needed; re-cover immediately
- Repair, replace, or supplement BMPs that are not adequately controlling sediment/pollutants
- Permits must be posted at the site in a conspicuous location
- Ensure that the ESC Plan and inspection reports are available for review at the site
- Remove temporary BMPs (silt fence, concrete washout, sediment traps) upon completion

Regular site inspections are a mandatory permit compliance requirement. KDOW rules for construction sites stipulate that BMP inspections occur every 7 days, or every 14 days and within 24 hours after 0.5 inches of rain. **For LFUCG capital projects, inspections are conducted every 7 days and within 24 hours after 0.5" of rain (or 4 inches of snow).** Inspection reports must be written, and include the following:

- Date of the inspection
- Name of the inspector
- Findings from the inspection
- Any actions taken as a result of the inspection

The permittee must promptly adjust erosion and sediment control practices if an inspection determines that existing measures or other BMPs in the plan are ineffective at minimizing sediment and other pollutants in stormwater runoff. BMP maintenance/repair must be completed within 48 hours. BMPs that cause ponding on public roadways must be repaired/replaced within 2 hours.

ESC Plan Development, Review, and Updates

The administrating division (DOE or DWQ) will conduct a summary review of the ESC plan. After reviewing the plan, the administrating division will notify the permit applicant in writing of any deficiencies or omissions, or will issue the land disturbance permit (LDP). The summary review includes:

- Checking the plan against the ESC Plan Review Checklist to make sure everything is included.
- Reviewing topography (slopes and drainage patterns), and noting the existing land cover.
- Identifying critical areas (habitat, woodlands) and 50 ft buffers for streams, wetlands, sinkholes.
- Reviewing the construction schedule and project phases (clearing, mass grading, etc.).
- Noting whether upgradient diversion berms or ditches are included, or needed (site run-on).
- Checking downgradient sheet flow sediment barriers (silt fence, fiber logs, rock berms, etc.).
- Evaluating ditch and channel construction and stabilization (seeding, mats/blankets, etc.).
- Checking ditch or pipe discharge areas for outlet protection / splash pads / armoring.
- Reviewing protection approaches for stormwater inlets at the site (drop, curb, pipe, etc.).
- Reviewing sizing and criteria for sediment traps/basins (volume, stabilization, outlet protection).
- Checking for stabilized exits, housekeeping BMPs, and plan notes (e.g., bare area stabilization).

Local, State, and Federal Permits

Capital projects typically require an LFUCG Land Disturbance Permit, which is issued by the Division of Engineering for projects that involve construction of a building or disturbance of 5,000 sq ft or more. In addition, projects that disturb more than one acre of land or impact streams and wetlands (i.e., due to trenching, temporary crossings, etc.) need permit coverage and authorization from the Kentucky Division of Water and the U.S. Army Corps of Engineers. These requirements are discussed below.

LFUCG Land Disturbance Permit

The LFUCG Land Disturbance Permit (LDP) is issued by the LFUCG DOE. The application form can be found at <https://www.lexingtonky.gov/new-development>. Development of an ESC Plan is required prior to applying. The ESC Plan checklist on page 8 of this handbook helps to ensure that all the required plan elements are included. Land Disturbance Permits are issued for one year, and must be renewed if construction continues past the expiration date. No work at the site is allowed until the permit is issued.

Permits automatically expire if work has not commenced within 180 days of permit issuance. Permit extensions are available 10 days prior to permit expiration upon written request to the LFUCG DOE for an extension. Requests must include sufficient justification for the extension, assurance that the extension does not create a new erosion hazard or allow an existing one to continue, and a new project completion date. Permits can be terminated prior to the one-year expiration date upon stabilization of the project site, which includes removal of all temporary BMPs and stabilization of all bare soil areas (i.e., with structural cover or at least 70% uniform density of vegetative cover).

KDOW Construction General Permit KYR10

Construction sites with a disturbed area of one acre or more – including those that are part of a common plan of development that will disturb one acre or more – require coverage under the Kentucky Division of Water KPDES Construction General Permit (KYR10). LFUCG ordinances require this permit coverage under Section 16-107 of the Code of Ordinances, which states that nothing in the ordinances “shall excuse a person that conducts clearing, grading, excavating, or filling activities from the responsibility of obtaining any other permits, licenses, certifications, or approvals required by the urban county government, the Commonwealth of Kentucky or United States.”

Section 16-104 of the ordinances address the need for KYR10 coverage prior to obtaining an LDP. Requirements of the KYR10 Permit mostly mirror those of the LFUCG LDP. A key terminology difference is that the KYR10 Permit requires a “Stormwater Pollution Prevention Plan” or SWPPP, which is basically the same as the LFUCG Erosion and Sediment Control (ESC) Plan. KYR10 coverage can be applied for online at <http://dep.ky.gov/formslibrary/Documents/KYR10PermitPage.pdf>. Other links are available at that site and in the Appendices, including a copy of the KYR10 Permit, guidance on SWPPP development, SWPPP templates, and technical guidance on construction site BMPs.

SWPPPs used as ESC Plans can be submitted to DWQ or DOE for review. BMPs must be consistent with the Stormwater Manual and the city’s Standard Drawings. DWQ/DOE will review SWPPPs within 10 days, and either provide comments or issue an LDP. Coverage by the city’s LDP does not relieve the permittee of any obligations or requirements related to the KDOW KYR10 Permit. The permittee must post a copy of the KYR10 Permit and the LDP at the work site in a conspicuous location, and send a copy of the KYR10 Notice of Termination to the LFUCG DOE when the project is ready for close-out.

US Army Corps of Engineers and FEMA

Some capital projects – such as sewer line replacement, building construction, and temporary stream crossings – impact intermittent and perennial streams and/or wetlands. Activities that result in the placement of dredged or fill material into waters of the U.S. require permit coverage under Section 404 of the Clean Water Act (CWA). Permits are issued by the U.S. Army Corps of Engineers, and must be accompanied by a KDOW Water Quality Certification, authorized under Section 401 of the CWA.

These permits and certifications stipulate approaches for minimizing impacts to public waterways. In general, projects that affect less than 300 linear feet of stream or less than ½ acre of wetland can be conducted under a US ACE Nationwide Permit. These are a type of general permit issued by US ACE for activities that are relatively routine and are minor in nature. Nationwide Permits cover specific construction activities (e.g., laying pipe across a stream, installing culverts or stormwater infrastructure, using rip rap to stabilize a stream bank, etc.). There are 49 Nationwide Permits issued to the public for various activities. In each case, there are specific thresholds regarding area and/or volume of impact that can result from the project, and each permit includes a set of general and regional conditions governing the work. Preconstruction notification to the US ACE in writing is almost always required prior to obtaining permit coverage. The notification is submitted on US ACE Form ENG 4345 and must include:

- Name, address and telephone numbers of the prospective permittee.
- Location of the proposed project.
- A description of the proposed project; the project's purpose; direct and indirect adverse environmental effects the project would cause, including the anticipated amount of loss of water of the United States expected to result.
- A sketch with sufficient detail to provide an illustrative description of the proposed activity (e.g., a conceptual plan), including information on impacts to water bodies.
- A delineation of regulated wetlands, other special aquatic sites, and/or other waters – such as lakes, ponds, and perennial, intermittent, and ephemeral streams – on the project site.
- Proposed information on the mitigation approach, if the proposed activity will result in the loss of greater than 1/10 of an acre of wetlands.
- Documentation regarding any endangered or threatened species that might be affected by the proposed work or that utilize critical habitat that may be affected by the proposed work.
- A statement and assessment regarding any impacts on historic property listed or potentially eligible for listing on the National Register of Historic Places.

More information on US ACE permits can be found on the KDOW web site at <http://dca.ky.gov/DCA%20Resource%20Document%20Library/KY%20Guide%20for%20Working%20in%20Stream%20Channels%20and%20Wetlands%20vAug%202011.pdf>.

Capital project contractors working in floodplains also need to check with the LFUCG Floodplain Coordinator in the Division of Water Quality to see if the project requires a Letter of Map Revision (LOMR) or Conditional Letter of Map Revision (CLOMR). A LOMR is FEMA's modification to a Flood Insurance Rate Map, Flood Boundary and Floodway Map, or both. LOMRs are generally based on the implementation of physical measures that affect the hydrologic or hydraulic characteristics of a flooding source and thus result in the modification of the floodway, the effective Base Flood Elevations, or the Special Flood Hazard Area. A LOMR revises the Flood Insurance Rate Map, Flood Boundary and Floodway Map, and sometimes the Flood Insurance Study report. A CLOMR is FEMA's comment on a proposed project that would affect the hydrologic or hydraulic characteristics of a flooding source and

thus result in the modification of the existing regulatory floodway, the effective Base Flood Elevations, or the Special Flood Hazard Area. The letter does not revise an effective NFIP map; rather, it indicates whether the project, if built as proposed, would be recognized by FEMA.

KDOW Water Quality Certification and Stream Construction Permit

Projects requiring a US ACE CWA Section 404 permit will need an LFUCG Floodplain Special Use Permit, a KDOW CWA Section 401 Water Quality Certification, and possibly a Stream Construction Permit. This includes projects where pipe or utilities are installed in trenches across or along a stream, stream relocations, construction within the 100-year floodplain, and similar work in the floodplain or the channel. KDOW has a combined permit application form that covers the Stream Construction Permit and Water Quality Certification. Contractors will need to request the certification letter from KDOW – it is not mailed automatically after application.

Also, note that construction activities within the floodplain are subject to KDOW floodplain regulations. The KDOW Floodplain Management Section has the primary responsibility for approving or denying proposed construction and other activities in the 100-year floodplain of all streams in the Commonwealth. Regulated activities include construction of dams, bridges, culverts, residential and commercial buildings, placement of fill, stream alterations or relocations, small impoundments, and water and wastewater treatment plants. See <http://water.ky.gov/floodplain/Pages/default.aspx>.

Construction Site Best Management Practices

This section provides information and photographs on practices to reduce polluted runoff. **All site runoff must pass through some type of BMP before moving offsite.** Thinking through the project and planning the construction process can help to keep stormwater issues to a minimum. At its most basic level, preventing or minimizing construction site runoff of sediment and other pollutants involves:

- Planning approaches that minimize the size of the bare soil area and the length of time disturbed areas are exposed to the elements – especially for long, steep slopes.
- Diverting or otherwise controlling the location and volume of run-on flows to the site.
- Covering bare soil with vegetation, mulch, erosion control blankets, turf reinforcement mats, gravel, rock, plastic sheeting, soil binder chemicals, etc., as soon as possible.
- Keeping concentrated flows in ditches stabilized with vegetation, rock, or other material.
- Physical filtration of sediment by trapping soil particles as muddy water passes through a silt fence, drop inlet screen, fiber log, etc.
- Settling processes, that allow sediment to fall out of flows that are slowed and temporarily impounded in ponds, traps, or in small pools created by berms, silt fencing, inlet protection dikes, check dams, and so on.
- Keeping fuel, oils, chemicals, and waste materials properly contained, covered, and away from the storm drain system.

When developing an erosion and sediment control plan, remember that large bare areas exposed to run-on and the elements for weeks and months will erode the most over time, especially where 1) rainfall is heavy, 2) soils are highly erodible, 3) slopes are long, and 4) slopes are steep. Selection of the appropriate BMPs – as detailed in this section – can help to overcome these site challenges.

BMP Selection Options for Various Construction Site Risk Conditions.

Functional Activity	Examples of Erosion Prevention and Sediment Control Approaches		
	BMPs for Lower Risks	BMPs for Moderate Risks	BMPs for Higher Risks
Planning	One-step clearing, grading, and stabilization	Two-phase clearing and grading, and stabilization	Multiple phases for clearing, grading, road and utility installation, building construction, etc.
	No critical areas, no mark-off areas needed	Infiltrative soils (i.e., for rain gardens, etc.) marked off limits to traffic	Infiltrative soils, tree preservation area(s), stream buffers marked off
	One stabilized site exit, comprised of rock pad	Length and width of rock pad extended to deal with exit traffic and mud conditions	Shaker rack or wheel washer might be needed to ensure minimization of trackout
	No stream crossings needed, no work in the 50 ft buffer zone	Installation of temporary rock drive-through or other stabilized stream crossing	Installation of piped stream crossing, moving up installation of planned bridge, etc.
Drainage Management	No upland flows to divert from active construction area, no diversions or pass-throughs needed	Diversion ditch or berm installed upslope to keep run-on off the site	Upslope run-on diversions installed; installation of stabilized channel to carry upland flows through site
	Sheet flow only; no concentrated flows, silt fencing only	Small, flat ditches double-seeded and lined with straw erosion control blanket	Larger, steeper ditches triple-seeded and lined with turf reinforcement mat
	No sediment trap or pond needed; sediment barrier (silt fence, fiber lots, etc.) suffices	Stabilized ditches; one or more sediment traps needed to remove soil from site runoff flows	Multiple sediment traps and sediment pond(s) needed; ensure ditch stabilization; review need for ditch checks
Soil Stabilization	No need for interim soil stabilization with one-step clearing / grading approach	All site areas are seeded after grading except for building pad and immediate area used for materials	Phased stabilization as project progresses; soil binders / blown straw used on bare areas idle > 14 days
	Grass seed and blown or hand-scattered straw mulch used to stabilize the site	Erosion control blanket installed over grass seed, with heavier seeding rates on slopes, ditches	Same as previous, with native mix and turf reinforcement mat or sod installed on steepest slopes
Sediment Trapping	Fiber rolls / logs or silt fence used for downslope perimeter control	Standard silt fence used for downslope perimeter control; wire-reinforced silt fence adjacent to critical areas	Wire-reinforced "super" silt fence used at multiple intervals for long slopes, critical areas; rock berms used for swales
	Rock bags or other simple dike used for storm drain inlets	Filter fabric insert, rock bags, etc. used for storm drain inlet protection	Rapid upland stabilization and inlet protection devices used for maximum removal of sediment and other pollutants
	Dust control not necessary due to short duration of project	Dust control addressed via water truck as needed	Polymers or other soil binders applied on construction areas/ roads as needed for dust control

See http://dep.ky.gov/formslibrary/Documents/09BMPManual_Final.pdf for detailed BMP information.

Planning and Phasing

LFUCG ordinances and the Stormwater Manual require that permittees minimize the size of the land disturbance and the period of time the disturbed area is exposed without stabilization, such as seed, mulch, straw, etc. Phased ESC Plans (i.e., grading, pipe installation, roadway construction, final grading) are required for residential subdivisions, and may make sense for large capital projects, depending on the type of project and the terrain. Contractors should note that no more than 25 acres can be disturbed at any time without soil stabilization.

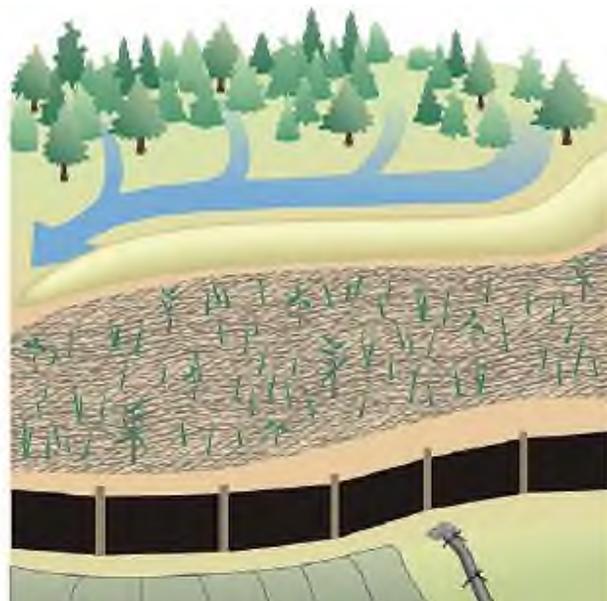
Practice	Cost	Effectiveness
Limiting disturbed areas through phasing	\$	5 water droplets
Protecting disturbed areas through mulching and revegetation	\$ \$	4 water droplets
Installing diversion around disturbed areas.	\$ \$ \$	3 water droplets
Sediment removal through detention of all site drainage	\$ \$ \$ \$	2 water droplets
Other structural controls to treat sediment-laden flow	\$ \$ \$ \$ \$	1 water droplet

Planning should include efforts to clear, grade, and complete work in project areas sequentially, so they can be stabilized with grass and seed. As the table above indicates, **phasing and revegetation costs much less than stormwater detention and other structural controls, and is much more effective in keeping sediment on the site.**

Note that erosion, sediment, and construction stormwater controls must be designed and installed and maintained to effectively minimize discharges from storm events up to and including a 2-year, 24-hour event, which is 3 inches. In addition, note that KDOW has a total suspended solids removal target of 80% for construction site sediment control BMPs.

Flow Diversions and Run-On Management

Upslope areas that drain to the project site will create problems during heavy rains. If possible, divert clean upland flows away from disturbed areas with stabilized ditches or berms. Otherwise, route the flow through the site in a stabilized ditch, so it does not become muddy.



Use a stabilized (seeded, mulched) ditch or berm to route upland flows around or through disturbed areas that are under construction. Use sod throughout the flow perimeter, or seed the berm/ditch after construction and cover seed with mulch (for flatter berms/ditches) or erosion control blankets / turf mats. Triple-seed areas below the flow line to ensure good grass densities, and to avoid do-overs.

Stabilization and Slope Protection

Stabilizing bare slopes, channels, and other areas with seed and mulch (or blankets/mats) is the cheapest and most effective means to prevent erosion and sediment runoff. The table below shows example seed types and rates for flat, sloping, and high traffic areas, and for ditches and channels. Note the higher seeding rates for high traffic and concentrated flow areas. Information on mulch products appears on the next page.

Recommended Seed Types and Application Rates for Various Site Conditions			
Seed species & mixtures	Seeding rate/acre	Per 1000 sq ft	Other information
<i>Seed and seed mixtures for relatively flat or slightly sloping areas</i>			
Perennial ryegrass	25 to 35 lbs	1 lb	Apply lime at 2 tons per acre if soil pH is below 5.5; use fertilizer only as recommended by site-specific soil tests. Use wildflower mixes to save on mowing and watering costs.
+ tall fescue	15 to 30 lbs	1 lb	
Tall fescue	40 to 50 lbs	1½ lb	
+ ladino or white clover	1 to 2 lbs	2 oz	
<i>Steep slopes, banks, cuts, and other low maintenance areas (not mowed)</i>			
Smooth bromegrass	25 to 35 lbs	1 lb	Track steep slopes with dozer up and down hill before seeding. Mulch slopes after seeding with 2 to 3 tons of straw or 6 tons of wood chips per acre. Use tackifier on mulch, disk it in, or punch in with sheep-foot roller. Disk or sheep-foot on the contour (across slope, on the level). For extremely steep slopes, use erosion control blankets after seeding. Use 20" spacing on blanket staples. No fertilizer near ditches.
+ red clover	10 to 20 lbs	½ lb	
Tall fescue	40 to 50 lbs	1 lb	
+ white or ladino clover	1 to 2 lbs	2 oz	
Orchardgrass	20 to 30 lbs	1 lb	
+ red clover	10 to 20 lbs	½ lb	
+ ladino clover	1 to 2 lbs	2 oz	
Crownvetch	10 to 12 lbs	¼ lb	
+ tall fescue	20 to 30 lbs	1 lb	
<i>Lawns and other high traffic or high maintenance areas (mowed)</i>			
Bluegrass	105 to 140 lbs	3 lb	Use wildflower / native grass mixes to save on mowing and watering costs. Do not establish grassed lawns near streams or wetlands – leave a 50 ft buffer of natural vegetation.
Perennial ryegrass (turf)	45 to 60 lbs	2 lb	
+ bluegrass	70 to 90 lbs	2½ lb	
Tall fescue (turf type)	130 to 170 lbs	4 lb	
+ bluegrass	20 to 30 lbs	1 lb	
<i>Channels and other areas of concentrated water flows</i>			
Perennial ryegrass	100 to 150 lbs	3 lb	Seed ditches and channels thickly. Do not use fertilizer near ditch or channel. Use erosion control blankets or turf reinforcement mats when channel bottom slopes exceed 3 percent. Silt check dams may be needed when channel slopes exceed 5 percent or when channels begin downcutting (gully) on the bottom. Do not use silt fencing or straw bales as silt check dams in channels with slopes greater than 3 percent; use rock, manufactured products, etc.
+ white or ladino clover	1 to 2 lbs	2 oz	
Kentucky bluegrass	20 lbs	½ lb	
+ smooth bromegrass	10 lbs	¼ lb	
+ switchgrass	3 lbs	2 oz	
+ timothy	4 lbs	¼ lb	
+ perennial ryegrass	10 lbs	¼ lb	
+ white or ladino clover	1 to 2 lbs	2oz	
Tall fescue	100 to 150 lbs	3 lb	
+ ladino or white clover	1 to 2 lbs	2 oz	
Tall fescue	100 to 150 lbs	3 lb	
+ perennial ryegrass	15 to 20 lbs	½ lb	
+ Kentucky bluegrass	15 to 20 lbs	½ lb	

Types of Mulches and Application Information			
Mulch product	Application rate	Benefits	Limitations
Straw or hay	1½ to 2½ tons per acre	Readily available and inexpensive; very effective in controlling erosion; can be applied on large sites via blower	May carry unwanted seeds; may need tackifier or anchoring, especially on steep slopes
Wood chips, bark, sawdust	5 to 8 tons per acre	Very low cost in some locations; chips effective on slopes up to 35 percent	High nitrogen demand when decomposing; may float away or blow away during rain storms
Rock	200 to 500 tons or more per acre	May be inexpensive and readily available in some localities; may be suitable for smaller sites	Inhibits plant growth; adds no nutrients to the soil; can be costly to apply on slopes and large sites; adds "hardened" look to slopes
Hydraulic mulches and soil binders	1½ to 2 tons per acre	Easily and rapidly applied with sprayer equipment; can include seed, fertilizer, and soil binders	May be too expensive for small or very remote sites; must dry for at least 24 hours before rainfall
Compost	2 to 3 tons per acre	Adds nutrients to the soil; readily available and inexpensive in some locations	Limited erosion control effectiveness; not suitable for steep slopes; may be expensive in some areas



Track-walk longer slopes with equipment to create indentations for trapping seed and effectively extending the slope length (top left). Cover seed with erosion control blanket or turf reinforcement mat (above). After seed emerges, silt fence can be removed (left).



Use slope drains to move water downhill where rutting might be a concern. Build a stable inlet using rock bags or other berming, and stake down pipe securely. Provide scour protection at pipe outlet.



Left photo shows erosion protection afforded by grass cover versus no cover. Right photo shows well-stabilized slope (foreground). Install silt fence when slope is constructed, remove when grass emerges.



Creek crossing for sewer line after installation. Note silt fencing at bottom of slopes, turf reinforcement matting within the channel flow area, rock toe protection at waterline, and excelsior blanket over seed on steep slope. Also, note the small footprint of the stream crossing, with undisturbed vegetation.

Erosion Control Technology Council standard specifications for erosion control blankets and mulch control nets.

ULTRA SHORT-TERM - Typical 3-month functional longevity						
Type	Product Description	Material Composition	Slope Applications*		Channel Applications*	Minimum Tensile Strength ¹
			Maximum Gradient	C Factor ^{2,5}	Permissible Shear Stresses ^{3,4,6}	
1.A	Mulch Control Nets	A photodegradable synthetic mesh or woven biodegradable natural fiber netting.	5:1 (H:V)	< 0.10 @ 5:1	= 0.25 lbs/ft ² (12 Pa)	5 lbs/ft (0.073 kN/m)
1.B	Netless Rolled Erosion Control Blankets	Natural and/or polymer fibers mechanically interlocked and/or chemically adhered together to form a RECP.	4:1 (H:V)	< 0.10 @ 4:1	= 0.5 lbs/ft ² (24 Pa)	5 lbs/ft (0.073 kN/m)
1.C	Single-net Erosion Control Blankets & Open Weave Textiles	Processed degradable natural and/or polymer fibers mechanically bound together by a single rapidly degrading, synthetic or natural fiber netting or an open weave textile of processed rapidly degrading natural or polymer yarns or twines woven into a continuous matrix.	3:1 (H:V)	< 0.15 @ 3:1	= 1.5 lbs/ft ² (72 Pa)	50 lbs/ft (0.73 kN/m)
1.D	Double-net Erosion Control Blankets	Processed degradable natural and/or polymer fibers mechanically bound together between two rapidly degrading, synthetic or natural fiber nettings.	2:1 (H:V)	< 0.20 @ 2:1	= 1.75 lbs/ft ² (84 Pa)	75 lbs/ft (1.09 kN/m)
SHORT-TERM - Typical 12 month functional longevity						
2.A	Mulch Control Nets	A photodegradable synthetic mesh or woven biodegradable natural fiber netting.	5:1 (H:V)	< 0.10 @ 5:1	= 0.25 lbs/ft ² (12 Pa)	5 lbs/ft (0.073 kN/m)
2.B	Netless Rolled Erosion Control Blankets	Natural and/or polymer fibers mechanically interlocked and/or chemically adhered together to form a RECP.	4:1 (H:V)	< 0.10 @ 4:1	= 0.5 lbs/ft ² (24 Pa)	5 lbs/ft (0.073 kN/m)
2.C	Single-net Erosion Control Blankets & Open Weave Textiles	An erosion control blanket composed of processed degradable natural or polymer fibers mechanically bound together by a single degradable synthetic or natural fiber netting to form a continuous matrix or an open weave textile composed of processed degradable natural or polymer yarns or twines woven into a continuous matrix.	3:1 (H:V)	< 0.15 @ 3:1	= 1.5 lbs/ft ² (72 Pa)	50 lbs/ft (0.73 kN/m)
2.D	Double net Erosion Control Blankets	Processed degradable natural and/or polymer fibers mechanically bound together between two degradable, synthetic or natural fiber nettings.	2:1 (H:V)	< 0.20 @ 2:1	= 1.75 lbs/ft ² (84 Pa)	75 lbs/ft (1.09 kN/m)
EXTENDED-TERM - Typical 24 month functional longevity						
3.A	Mulch Control Nets	A slow degrading synthetic mesh or woven natural fiber netting.	5:1 (H:V)	< 0.10 @ 5:1	= 0.25 lbs/ft ² (12 Pa)	25 lbs/ft (0.36 kN/m)
3.B	Erosion Control Blankets & Open Weave Textiles	An erosion control blanket composed of processed slow degrading natural or polymer fibers mechanically bound together between two slow degrading synthetic or natural fiber nettings to form a continuous matrix or an open weave textile composed of processed slow degrading natural or polymer yarns or twines woven into a continuous matrix.	1.5:1 (H:V)	< 0.25 @ 1.5:1	= 2.00 lbs/ft ² (96 Pa)	100 lbs/ft (1.45 kN/m)
LONG-TERM - Typical 36 month functional longevity						
4	Erosion Control Blankets & Open Weave Textiles	An erosion control blanket composed of processed slow degrading natural or polymer fibers mechanically bound together between two slow degrading synthetic or natural fiber nettings to form a continuous matrix or an open weave textile composed of processed slow degrading natural or polymer yarns or twines woven into a continuous matrix.	1:1 (H:V)	< 0.25 @ 1:1	= 2.25 lbs/ft ² (108 Pa)	125 lbs/ft (1.82 kN/m)

Source: Erosion Control Technology Council, 2003.

Notes: * C factor and shear stress for Types 1.A., 2.A. and 3.A mulch control nettings must be obtained with netting used in conjunction with preapplied mulch material.

¹ Minimum Average Roll Values when tested in the machine direction using ECTC Modified ASTM D 5035.

² C Factor calculated as ratio of soil loss from RECP protected slope (tested at specified or greater gradient, h:v) to ratio of soil loss from unprotected (control) plot in large-scale testing. These performance test values should be supported by periodic bench scale testing under similar test conditions using ECTC Test Method # 2.

³ Minimum shear stress RECP (unvegetated) can sustain without physical damage or excess erosion [> 12.7 mm (0.5 in) soil loss] during a 30-minute flow event in large-scale testing. These performance test values should be supported by periodic bench scale testing under similar test conditions and failure criteria using ECTC Test Method #3.

⁴ The permissible shear stress levels established for each performance category are based on historical experience with products characterized by Manning's roughness coefficients in the range of 0.01 - 0.05.

⁵ Acceptable large-scale test methods may include ASTM D6459 or other independent testing deemed acceptable by the engineer.

⁶ Acceptable large-scale testing protocol may include ASTM D6460 or other independent testing deemed acceptable by the engineer.

Erosion Control Technology Council standard specifications for permanent turf reinforcement mats.

Type ¹	Product Description	Material Composition	Minimum Tensile Strength ^{2,3}	Minimum Thickness (ASTM D 6525)	UV Stability (ASTM D 4355 @ 500)	Channel Applications Permissible Shear Stress ^{4, 5}
5.A	Turf Reinforcement Mat	Long term, non-degradable rolled erosion control product composed of UV stabilized, non-degradable, synthetic fibers, filaments, nettings and/or wire mesh processed into three-dimensional reinforcement matrices designed for permanent and critical hydraulic applications where design discharges exert velocities and shear stresses that exceed the limits of mature, natural vegetation. Turf reinforcement mats provide sufficient thickness, strength and void space to permit soil filling and/or retention and the development of vegetation within the matrix.	125 lbs/ft (1.82 kN/m)	0.25 inches (6.35 mm)	80%	= 6.0 lbs/ft ² (288 Pa)
5.B	Turf Reinforcement Mat		150 lbs/ft (2.19 kN/m)	0.25 inches (6.35 mm)	80%	= 8.0 lbs/ft ² (384 Pa)
5.C	Turf Reinforcement Mat		175 lbs/ft (2.55 kN/m)	0.25 inches (6.35 mm)	80%	= 10.0 lbs/ft ² (480 Pa)

Source: Erosion Control Technology Council, 2003.

Notes:

- ¹ For applications in channels and on slopes not exceeding 0.5:1 (H:V) where vegetation alone will not sustain expected flow conditions and/or provide sufficient long-term erosion protection. For TRMs containing degradable components, all property values must be obtained on the non-degradable portion of the matting alone.
- ² Minimum Average Roll Values, machine direction only for tensile strength determination using ASTM D6818 (Supersedes Mod. ASTM D5035 for RECPs)
- ³ Field conditions with high loading and/or high survivability requirements may warrant the use of a TRM with a tensile strength of 44 kN/m (3,000 lb/ft) or greater.
- ⁴ Shear stress that fully vegetated TRM can sustain without physical damage or excess erosion [> 12.7 mm (0.5 in.) soil loss] during a 30-minute flow event in large scale testing.
- ⁵ Acceptable large-scale testing protocol may include ASTM D6460 or other independent testing deemed acceptable by the engineer.

The tables for seed application, mulch types, blanket/mat selection (previous subsection), and blanket/mat installation tips (this section) provide important information regarding specific site and slope stabilization conditions and procedures. The primary goal is to complete grading work on portions of the site, and install the seed and mulch/blanket/mat as soon as possible. Soil conditions right after grading are usually optimal for seeding; waiting only invites soil sealing, rilling, and rutting from rainfall. Use barrier fencing to keep equipment and vehicle traffic away from newly-seeded areas.

Do not use fertilizer unless it is specified by a soil test. Fertilizer runoff contributes to nutrient and algae impacts in local water bodies. Keep silt fencing and other temporary sediment barriers in place until the seed fully emerges, then remove. Keep grass in channels and on slopes as long as possible – avoid cutting it short, which reduces the slope’s structural stabilization potential.

Installation Tips for Rolled Erosion Control Products

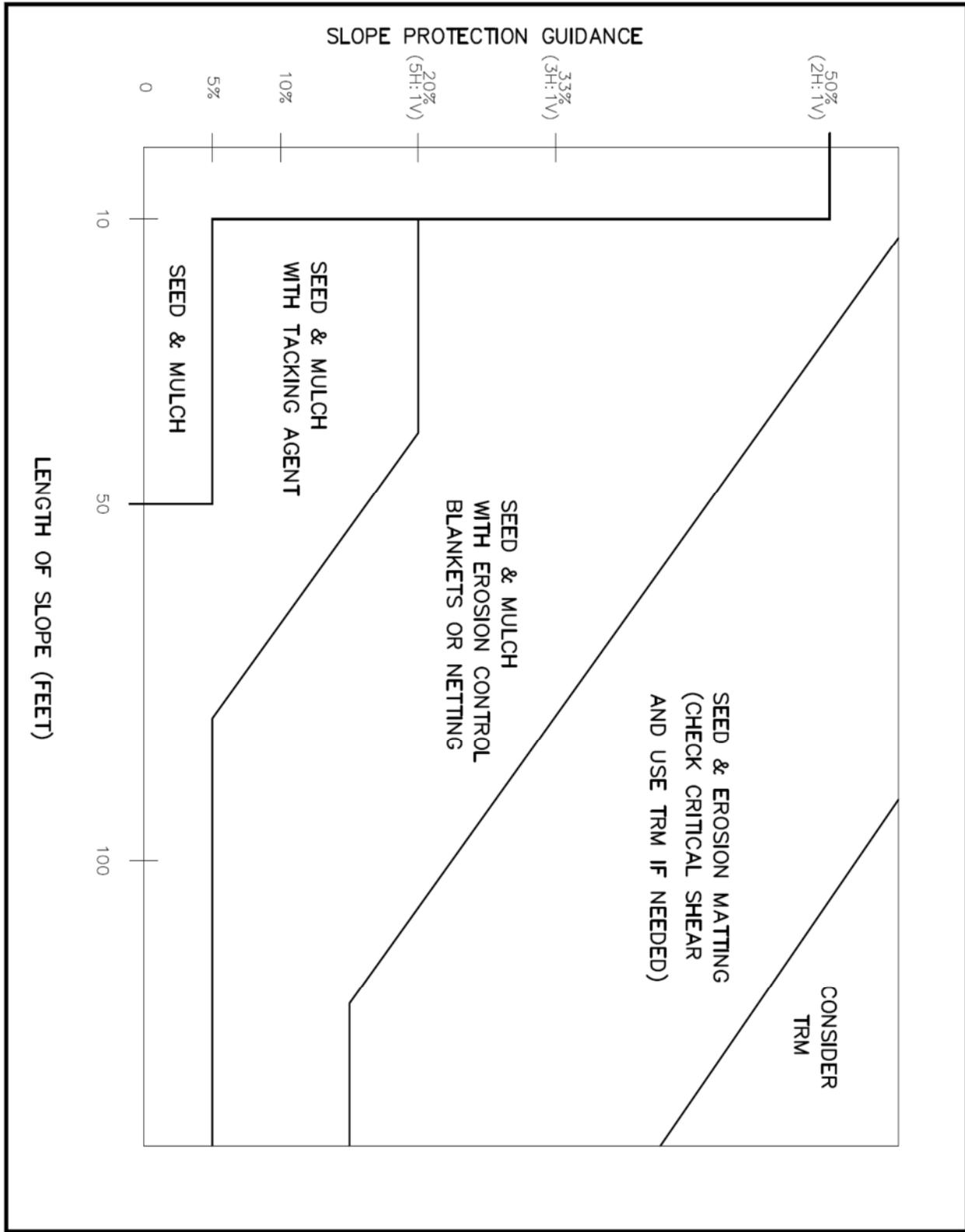
Site conditions	Erosion Blanket / Turf Mat Notes
Ditches and channels (from flow line to channel bottom)	Grade, disk, and prepare seedbed. Seed and lime (no fertilizer in ditch). Install horizontally (across slope). Start at channel bottom, at low end. Staple down centerline of blanket first. Staple & bury top in 8” deep trench. Top staples should be 12” apart. Uphill layers overlap bottom layers. Side overlap should be 4 to 6 inches. Side & middle staples = 24” apart. Staple below the flow level every 12”. Staple thru both blankets at overlaps. Use longer staples for high velocities.
Long slopes, including areas above channel flow levels	Grade, disk, and prepare seedbed. Seed and apply lime if needed. Install vertically (up & down hill). Unroll from top of hill if possible. Staple down centerline of blanket first. Staple & bury top in 8” deep trench. Top staples should be 12” apart. Side & middle staples = 24” apart. Uphill layers overlap downhill layers. Overlaps should be 4 to 6 inches. Staple thru both blankets at overlap.



Blown or hand-scattered straw mulch over seed works well for small, uneven sites with flat or gentle slopes. Hydraulic applications (right) include seed, cellulose mulch, fertilizer, water, surfactants, and other binders mixed into a slurry that can be sprayed up to 75 feet – or more – with the right equipment.



LFUCG Stormwater Manual Guide for Selecting Rolled Erosion Control Products



NOTE: Use longer (and more) staples for high-velocity channels and for slopes steeper than 1H:1V.

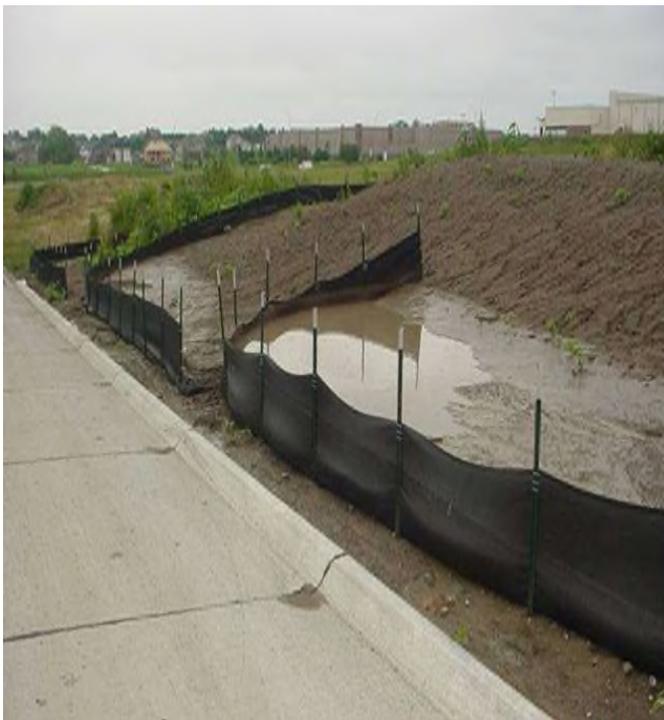
Silt Fencing and Other Sediment Barriers

Sediment barriers are installed downhill from disturbed areas to intercept muddy flows and promote sediment removal through filtration and/or settling processes. Silt fencing is the most common sediment barrier, but fiber logs, rock bags, rock berms, brush packing, and other materials are available.

Installation of sediment barriers must be secure enough to prevent dislodgement and bypasses. Sediment barriers are high maintenance, and must be cleaned regularly after rainfall. They are also considered temporary BMPs, and must be removed when the upgradient area is stabilized (i.e., with grass, landscaping, impervious surfaces, etc.).



Wire-reinforced silt fence (top left) is required adjacent to streams, wetlands, sinkholes, tree protection areas, and greenways. Make sure wire is between the filter fabric and the posts. Conventional silt fencing (above) works well if trenched in and installed properly. J-hooks (left) trap flows moving downgradient along the fencing. Use J-hooks to intercept flows that might move down to a low area and cause a silt fence blowout. Install silt fencing on the contour; leave room for maintenance (below).





Fiber logs (top left) can be used for small, flatter sites. Make sure they are bedded in, have complete contact with the ground, and are staked down securely. Rock bags (top right) are also useful for small flat sites. Fill the bags 2/3 full, so they can be packed tightly together. Rock berms (lower left) make excellent sediment barriers and are used in place of silt fencing and for sediment trap berms. Use silt fence, rock bags, channel toe protection, seeding, mulching, trees, and blankets/mats for stream crossings (bottom right, above).

Storm Drain Inlet Protection

Storm drain curb and drop inlets require a berm or filtering device to remove sediment through settling or filtration. These can be fabricated from rock bags, filter fabric, or other materials. Note that where inlet protection devices are installed on public roadways there may need to be a safety cone or other designation to reduce road hazards. Undergrate filter fabric can be used in these situations – it needs to be cleaned frequently. For best results, identify and address upstream sources of muddy flow via stabilization, sediment barriers, or other means. Keep inlet protection in place until all contributing areas are stabilized, then remove.





Inlet protection devices range from rock bags (top row) and rock berms (above) to filtration products (below). Install inlet protection before beginning any soil-disturbing work, such as clearing, grading, pavement cutting, etc. Keep the inlet protection in place until all upstream areas are stabilized with vegetation, landscaping, or impervious surfaces. Remove accumulated sediment regularly. Immediately repair/replace inlet filters that cause ponding on public roads for more than two hours after rain events.



Culvert Outlet Scour Protection

Culvert discharge flows exit at high velocities and erode the area near the discharge. Use armored aprons made of rock, turf reinforcement mat and grass, pavement, or other material where culvert flows emerge and begin to spread out, reducing velocities. Aprons are typically trapezoidal-shaped, and slightly convex to prevent side-wash erosion. Where culvert flows are directed into ditches, ensure that the ditch bottom and affected channel banks can handle the erosive forces of the discharge. Implementing these protective measures when culverts and ditches are installed can prevent costly adaptations and repairs to scoured areas later on.



Rock is used frequently for scour protection aprons (left, and top left), but other options are available. Open-celled concrete or plastic matting (top right) and turf reinforcement mats (bottom left, above) can provide scour protection equivalent to rock at comparable prices, and provide a finished “green” look that avoids the hard look of rock or pavement. Note that some turf mat applications in high velocity areas will require longer staples, heavier seeding, and closer spacing for staples. Extend armoring material up the sides a bit for best results.

Drainage Ditch Stabilization

LFUCG requires that all ditches be stabilized after they are constructed. Stabilization must be sod or seeding covered by mulch, erosion control blanket, or turf reinforcement mat (see tables in the preceding section for selection). For wide swales draining areas less than $\frac{1}{4}$ acre, use straw over seed. Long, steep ditches will likely require turf reinforcement mat over seed or armoring with rock or pavement. Triple-seed ditches below the flow line, to ensure good grass coverage and prevent do-overs. Stake down blanket/mat securely – they can move when flow velocities rise. Look for scour points along ditches – typically where stormwater pipes discharge into channels. Use turf mats or rock to armor these areas. **Do not use fertilizer within ditch or channel banks.**



Erosion control blankets of straw, coconut, wood fiber, and other biodegradable materials are used on shorter, flatter ditches (top row). Permanent turf reinforcement mats (above) are specified for longer, higher velocity ditches, where erosion is likely. Concrete, plastic, and other open-cell or woven liners can also be used with seed to armor channels while providing the “softer” look of vegetation (below left). Rock-lined ditches (below right) are often used for flow armoring where aesthetics are less of a concern.





Ditch checks (check dams, silt checks, etc.) can be used in ditches to prevent downcutting and channel bottom erosion. They can be made of fiber logs (top left), plastic products (top right), rock, rock bags, or other materials. Space the checks closer in steeper ditches, and farther apart for flatter conditions.

Sediment Traps and Ponds

Sediment traps are required for all disturbed areas less than five acres not draining into a sediment pond. They must be designed, installed, and maintained to effectively minimize discharges for a three-inch rainfall. Smaller traps arranged in a series can be used to meet the design requirement. Sediment must be removed before the trap is half full. Most sediment traps use rock berms with mixed rock (e.g., #2 and #57), but stabilized earthen berms with rock or turf mat spillways are acceptable. Locate traps in landscape dips or swales, where silt fencing would likely fail. Do not put them immediately in front of culverts or at culvert outlets if possible. Do not include an underdrain pipe. Stabilize outflow area.



Sediment traps provide vital protection for areas where concentrated flows may leave the site. Use rock or earthen berms, and clean them out when they are half full of sediment.



Sediment ponds must be used for disturbed areas exceeding five acres. The maximum drainage area for a single pond is 100 acres. The ponds must be designed to remove 80% of the total suspended solids for the 10-year, 24-hour storm (4.3”), with a detention time of 24 to 48 hours. Turf reinforcement mats must be used immediately above and below the water line in all wet ponds. Design and construction shall comply with all federal, state, and local laws, ordinances, rules, and regulations regarding dams. Erosion controls (e.g., seeding, mulching, sodding, diversions, etc.) are required when building ponds.



Stabilize sediment pond berms and banks as soon as possible after construction. Increase detention time by using rock, filter fabric, rock bags, etc. to modify the inlet – with a berm or other approach that slows down the exiting flow, allowing more sediment to settle out.

Good Housekeeping Practices

Identify liquids, powders, and other materials on site that may leach pollutants if exposed to rainfall. Keep these items under cover, and away from the storm drain system. Handle fuel, oil, and other materials that may cause water quality problems away from ditches and drains. Train employees to clean up spills and leaks immediately, using dry methods – not washdowns. Keep spill kits available where leaks and spills are likely. Provide a concrete washout for delivery trucks, with plenty of available capacity. Keep litter and other wastes picked up and stored in covered containers. Use a water truck, dust suppressants (e.g., soil binders), or prompt seeding/mulching to minimize dust. Maintain a stabilized construction exit (e.g., #2 rock, over geotextile) with a cleanup plan to keep mud and rock off public roadways.

Keep materials covered and away from ditches and storm drains (above right). Locate the concrete washout near delivery truck exit route (right). Make sure there is enough volume in the washout to handle each day’s needs. Contractors are responsible for ensuring the availability and use of concrete washouts at the site. Replace when full.





Fix leaks and clean up spills as soon as possible (top left), and keep pollutants out of the storm drain. Construction exit pad must be at least 20 ft wide, 50 ft long, with 6 inches of #2 rock over geotextile (top right). Keep a small footprint with earth disturbances, laydown areas, and parking, so most of the site can be seeded and mulched as soon as possible (bottom left). Control dust as needed (below).



Dewatering

As noted previously, **all discharges containing sediment or other pollutants must pass through a BMP**. Dewatering discharges composed of clean, clear groundwater – with no visible turbidity, sheen, or settleable solids – can be discharged to the storm drain system. All other dewatering or other discharges must pass through a BMP. Sediment filter bags are acceptable if they remove at least 80% of the suspended solids. Other options include discharge to a bermed containment constructed of silt fence, rock bags, or rock; discharge to a vegetated area capable of infiltrating the discharge; and use of a sediment trap or fabricated sediment removal basin.



Placing filter bags on broad, flat, vegetated areas helps to dissipate and infiltrate flows.



Structures for removing sediment via filtration and settling processes can be fabricated from rock and filter fabric (top photos). Use silt fence, fiber logs, wattles, etc. to provide additional detention and filtration where needed (bottom left). Also available are portable multi-chambered sediment traps made of metal, plastic, and filter fabric that can be rented or fabricated for temporary use.

Temporary Stream Crossings

Construction of a temporary stream crossing is required when moving equipment across intermittent or perennial streams. All crossings – drive-through and piped or culverted – must be authorized by a KY DOW 401 Water Quality Certification and a US ACE 404 Permit. Clearing and excavation of the streambed and banks must be kept to a minimum. Contractors must also minimize disturbances in the vegetated buffer zone by using hand-held or other low-impact equipment where possible.

The approaches to the crossing must consist of stone pads with a minimum thickness of 6 inches, a minimum width equal to the width of the pipe/culvert, and a minimum approach length of 25 feet on each side. Pipes/culverts, where used, must be removed as soon as they are no longer necessary. After completion of the project and removal of crossing, the stream must immediately be reshaped to its original cross section and properly stabilized. Turf reinforcement matting is typically specified to stabilize stream banks that have been disturbed by construction. Trees and shrubs may also be used.

Select stream crossing sites where banks slope down gently. Minimize vegetation removal along banks. Install approach ramps on both sides with #2 rock, underlain by geotextile. For drive-through crossings (top photo), choose a site with a bedrock bottom. Do not place rock in channel – just on the approach ramps. For piped / culverted crossings (bottom photo), place pipe or culvert directly on the stream bottom – do not excavate the channel bottom. Use 18 inch pipe minimum – the larger, the better. Construct crossing so it dips in the middle, promoting overflow there instead of around the ends. Use only rock to cover the pipes, not soil. Rock covering pipes can be #57 or mixed #57 and #2. For all applications, use silt fence, seed, and straw or blanket to stabilize disturbed areas after constructing the crossing.



Contractor Site Inspection Requirements

The contractor must obtain the LFUCG Land Disturbance Permit and inspect the site weekly and within 24 hours after 0.5 inches of rain (or 4 inches of snow). Signed, written inspection reports are required, containing: 1) inspection date; 2) name of the inspector; 3) the findings from the inspection; and 4) any actions taken as a result of the inspection.

Inspection reports must be retained onsite for 180 days after project completion. The main objectives of inspections are to determine the overall effectiveness of the erosion, sediment, and stormwater controls, and to identify needed maintenance or additional control measures. Permittees must amend erosion and sediment control practices if their inspections – or inspections by LFUCG – determine that existing erosion control measures or other best management practices in the plan are ineffective.

Other inspectors (i.e., from the Kentucky Division of Water, the Division of Water Quality, or the Division of Engineering) may also inspect projects regularly. LFUCG has an escalating enforcement program to compel compliance. Enforcement actions begin with informal warnings, and proceed to notices of violation and withholding of payments for capital projects. Citations, fines, and other penalties result for ongoing failure to comply. See appendices for details on inspection requirements.

Appendices

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Key Agencies and Individuals Involved in Capital Projects

There are a number of key agencies and individuals involved with capital construction projects in Lexington. A summary list of these is posted below.

Key Agencies

Lexington-Fayette Urban County Government (LFUCG)

The governing body of the combined city/county government for the City of Lexington and Fayette County, Kentucky, consisting of an elected mayor and council members.

LFUCG Division of Engineering (DOE)

The Division of Engineering oversees the design and construction of capital infrastructure projects, ensures new development is compliant with the community's standards, and manages permitting within the public right-of-way.

LFUCG Division of Water Quality (DWQ)

Provides citizens with sewage conveyance and transmission services, wastewater treatment, and stormwater management services, including wastewater and stormwater capital projects.

LFUCG Division of Environmental Services (DES)

Provides a wide range of environmentally-related services to city government and the public, including beautification, urban forestry, greenway management, mowing, enforcement of environmental ordinances, public outreach and education, and internal energy initiatives.

Kentucky Division of Water (KDOW)

Manages, protects, and enhances the quality and quantity of water resources through voluntary, regulatory, and educational programs. KDOW issues and enforces stormwater discharge permits issued to municipalities and construction site operators, and ensures that water quality standards are met.

Key Individuals

Contract Administrator

LFUCG DOE or DWQ person responsible for ensuring that capital project contract obligations are met.

Contractor

Entity legally obligated to construct capital projects via a mutually agreed upon contract and the entity responsible for obtaining the LFUCG Land Disturbance Permit and KYR10 Permit where applicable.

Contractor's Inspector

Person responsible for conducting the inspections required by the LFUCG Land Disturbance Permit and KYR10 Permit where applicable.

LFUCG Compliance Inspector

Person in the Division of Engineering or Division of Water Quality who inspects the project at least once a month (two times a month if the project is a targeted site) to ensure the Contractor is complying with the Land Disturbance Permit. This includes Resident Project Representatives (RPRs) under contract to LFUCG to provide such services.

Permitting, Inspection, and Enforcement Procedures for Erosion and Sediment Control on DOE and DWQ Capital Projects

Permitting Procedures

1. Contractor shall develop a Stormwater Pollution Prevention Plan / Erosion and Sediment Control Plan (SWPPP / ESC Plan). A SWPPP/ESC Plan template is on the LFUCG website at <https://www.lexingtonky.gov/new-development>.
2. 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**, any needed amendments/updates, and the implementation of the plan during construction.
3. 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 www.lexingtonky.gov/permits or <https://aca3.accela.com/lexky/>. Permit applications must be completed on line.
4. For projects with a disturbed area of > 1 acre, including those in a common plan of development > 1 acre, the permittee 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>.
5. Contractor cannot start project work until they have obtained the LFUCG Land Disturbance Permit and KYR10 Permit coverage (if applicable – see above).
6. Designated DOE or DWQ engineering staff will review the SWPPP/ESC Plan, confirm that the Contractor has obtained KYR10 Permit coverage, and issue the Land Disturbance Permit.
7. Contractor then installs the initial BMPs, prior to general excavation, grading, etc.
8. The DOE or DWQ Contract Administrator will issue a Notice-to-Proceed to the Contractor after confirming that the Contractor has obtained KYR10 Permit coverage (if applicable), the LFUCG Land Disturbance Permit, and the first BMPs have been installed and inspected by DOE or the DWQ Resident Project Representative (RPR). The Contractor then begins the project.

Contractor Responsibilities

Contractor shall:

1. Review, update, and amend the SWPPP/ESC plan, and use it onsite during construction.
2. Attend a pre-construction conference with LFUCG.
3. Post the LFUCG Land Disturbance Permit and KYR10 Permit on the project sign at the site, and keep a copy of the SWPPP/ESC plan on site and available for review.
4. Follow the SWPPP/ESC Plan; revise and redline it as conditions change on the site.
5. Install and maintain BMPs to prevent sediment from washing into streets, storm sewers, and streams. All runoff from disturbed areas must pass through a BMP before leaving the site.
6. Conduct an ESC inspection at least once every 7 calendar days and within 24 hours after each rainfall of 0.5" or greater (or 4" of snow).
7. Complete and sign the inspection form after each inspection.
8. Stabilize inactive portions of the site within 14 days of inactivity, and provide permanent stabilization within 14 days of reaching final grade.
9. Maintain a 50' vegetative buffer strip along perennial and intermittent streams (including impounded streams), wetlands, sinkholes, and storm drain inlets.
10. If work must be done within 50' of a perennial or intermittent stream, wetland, sinkhole, or inlet, work during dry weather, complete work as soon as possible, and stabilize the area within 24 hours of any period of inactivity.
11. File a Notice of Termination with the KY Division of Water and forward to the LFUCG Division of Engineering, and LFUCG Division of Water Quality when construction has been completed and the site is stabilized. Final stabilization is defined as follows from KYR10: "All soil disturbing activities at the site have been completed and either of the two following criteria are met – a uniform (e.g., evenly distributed, without large bare areas) perennial vegetative cover with a density of 70 percent of the native background vegetative cover for the area has been established on all unpaved areas and areas not covered by permanent structures, or equivalent stabilization measures (such as the use of riprap, gabions, or geotextiles) have been employed."
12. Respond promptly to reports from the DOE Inspector or the Resident Project Representative, and to Verbal Warnings and Notices of Violation from LFUCG staff regarding correcting ESC or other problems at the site.

Inspection Procedures for the DOE or DWQ Compliance Inspector

Monthly Field Inspection (two times a month if crossing a stream or in a floodplain)

1. Ensure the LFUCG Land Disturbance Permit and KYR10 Permit are posted at the site
2. Ensure SWPPP/ESC Plan is available for review
3. Ensure that the weekly and rain event inspection forms are available for review
4. Walk the perimeter of the entire site
5. Note downgradient controls
 - Inspect ditches and sheet flow areas
 - Silt fences working? Ditches vegetated/stabilized?
 - Significant sediment discharges?
6. Walk around internal disturbed areas
 - Idle for more than 14 days . . . stabilized?
7. Inspect all inlets and ditches
 - Inlets protected, ditches stabilized?
8. Check out material/fuel storage areas
 - Spills? Leaks? Leaching pollutants? Litter/waste managed?
9. Inspect concrete washout(s)
10. Inspect the construction entrance/exit
11. Inspect the 50 ft vegetated buffer strip adjacent to waterways (stabilized within 24 hrs. of any period of inactivity.)
12. Communicate inspection findings to contractor, note issues that need attention
13. Complete the LFUCG inspection checklist
14. Give the checklist to Richard Lamey for entering into ACCELA

Important things for the Inspector / Permittee / Contractor to look for:

- Posted permits, plans, and inspection reports
- Graded / inactive areas stabilized with seed, mulch, blankets, mats, etc.
- Stabilized, non-eroding ditches
- Maintenance on silt fences and curb/drop inlets
- No mud on the street
- Trash and litter managed

No disturbance in 50 ft buffer zone adjacent to streams, wetlands, sinkholes, and inlets, unless approved; areas within the 50 ft buffer must be stabilized within 24 hours of inactivity.

Enforcement Procedures

1. When DWQ or DOE Compliance Inspectors identify erosion and sediment control deficiencies, they shall issue a verbal warning to the Contractor to address the deficiencies. If the deficiencies are not addressed, they shall notify the Contract Administrator of the deficiencies. **Refer to the attached Compliance Assistance Guidance.**
2. The Contract Administrator is authorized to use all available means in the contract to obtain compliance, including stopping work or withholding payment until the issue is resolved. Notices of Violation may be issued if necessary. In addition, the ESC Performance Bond, where applicable, may be called.

Compliance Assistance Guidance for DWQ and DOE Capital Project Compliance Inspectors

Observed Condition	Verbal Warning to Correct within 3-5 days	Verbal Warning to Correct within 24 hours (See Note 1)	Contract Administrator Uses Contract Terms and Conditions to Achieve Compliance
Construction Entrance to Public Road	Rock pad poorly installed/maintained	Rock pad not installed	
	Small amount of sediment on road	Rock pad completely covered with soil	
		Significant amount of sediment on road	
Unstabilized Areas	Flat inactive disturbed areas not stabilized in 14 days	Ditches not stabilized immediately after construction	
		Disturbed, inactive slopes not stabilized within 14 days	Disturbed, inactive slopes above waterways and within 50 ft of wetlands, floodplains, critical areas not stabilized within 24 hours of inactivity
Inlet Protection	Sediment needs to be removed around inlet protection	Curb inlet protection not in place or improperly installed	Discharge of concrete wash water, chemicals, other pollutants into inlets, streams, wetlands, etc.
Silt Fencing	Does not match SWPPP / ESC Plan but critical areas and roads are protected	Silt fence not installed per plan	
	Does not comply with Stormwater Manual but is functional	Blowouts have occurred with discharge of sediment to critical areas	
	Needs maintenance/repair, but is not near an inlet or surface water	Not trenched in, is not functional	
		Needs repaired in critical areas	
Soil Stockpiles	No perimeter controls, downstream BMPS in place	No perimeter controls, downstream BMPs not in place	
Permit Violations		Permit expired	Site not permitted
		Permit not posted or available on site	
		Contact name/phone not posted	
		No self-inspection reports; reports not on site	
		Self-inspection reports not current	
		SWPPP / ESC Plan not on site	
		Minor unapproved construction activities in 50 ft buffer zone around sinkholes, streams, wetlands, etc.	Major unapproved construction activities in the 50 ft buffer zone around sinkholes, streams, wetlands, etc.
		Construction has started, BMPs not installed	

1. Refer issue to Contract Administrator after 2nd Verbal Warning.
2. Refer repeat or chronic offenders to the Division Director for an enforcement conference.
3. Critical areas are streams, wetlands, sinkholes, and inlets.

Construction Site Inspection Form



OFFICE USE ONLY							
<input type="checkbox"/> NDCS	<input type="checkbox"/> NDCL	<input type="checkbox"/> NDRS	<input type="checkbox"/> NDRL	<input type="checkbox"/> CIP-DOE	<input type="checkbox"/> CIP-DWQ	<input type="checkbox"/> CIP-OTH	<input type="checkbox"/> DEMO
							Inspector Report # <input style="width: 100%;" type="text"/>

SOIL EROSION AND SEDIMENT CONTROL INSPECTION REPORT

PROJECT NAME OR ADDRESS: _____ GRADING/BUILDING PERMIT # _____

TYPE OF OPERATOR (Check one): CONTRACTOR DEVELOPER BUILDER NAME: _____

INSPECTION DATE: _____ TIME: _____ INSPECTED BY (INITIALS): _____

COMPLIANCE LEVEL			Reason for Inspection (Check one):
Compliant	Non-Compliant	N/A	<input type="checkbox"/> Initial ESC <input type="checkbox"/> Regular/Targeted <input type="checkbox"/> 2 nd Targeted <input type="checkbox"/> Verbal Follow-up <input type="checkbox"/> NOV Follow-up <input type="checkbox"/> Complaint <input type="checkbox"/> Other: _____
1			Engineer's Erosion and Sediment Control Plan is on site and is being followed
2			Written, signed weekly inspection reports by permittee are on site
3			Environmentally Sensitive Areas are marked with orange fence, undisturbed and protected from sediment
4			Floodplain is free of grading, stockpiling and activity except as shown on ESC Plan
5			50 Foot Buffer strip along streams, sinkholes, and wetlands is marked and is free of construction activity
6			Maximum area exposed without mulch is 25 acres
7			Disturbed areas inactive for 14 days are stabilized with appropriate materials
8			Construction entrance and parking areas (where provided) are properly sized and stabilized with No. 2 stone
9			Diversion channels are installed and stabilized
10			Silt fence is installed, properly trenched in, and maintained down slope of bare areas
11			Sediment ponds are installed and maintained
12			Sediment traps are installed below areas that do not drain into sediment ponds
13			Stormwater pipe inlets and curb/drop inlets and outlets are properly protected
14			Check dams are installed and maintained
15			Impact stilling basins are installed and properly stabilized
16			Soil stockpiles are mulched or seeded and protected with perimeter silt fence
17			Erosion control blanket or turf mat is installed and maintained
18			Channels/ditches are stabilized immediately with sod (or seed with blanket/mat)
19			Stream crossings are installed with rock driveway, mulched slopes, and maintained
20			Dewatering discharge is filtered/infiltrated with no muddy discharge to streams/inlets
21			Pump around flow diversions are in operation
22			Soil and mud is being kept off streets
23			Soil and mud is being kept out of ditches, streams, and other waters
24			Trash, debris, fuel, and other materials are properly stored/maintained
25			Concrete washout site is installed and properly maintained
26			Dust Controls are properly implemented and maintained

COMMENTS:

<input type="checkbox"/> Verbal Warning Issued (Date: _____)	<input type="checkbox"/> NOV Issued (Date: _____)	Signature: _____
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Revised 03/09/18

KPDES	
	KENTUCKY POLLUTANT DISCHARGE ELIMINATION SYSTEM
PERMIT	
PERMIT NO.: KYR100000 AI NO.: 35050	
AUTHORIZATION TO DISCHARGE UNDER THE KENTUCKY POLLUTANT DISCHARGE ELIMINATION SYSTEM (KPDES)	
Pursuant to Authority in KRS 224,	
Stormwater Discharges Associated with Construction Activities	
is authorized to discharge from a facility located at	
Within any of the 120 counties of the Commonwealth of Kentucky	
to receiving waters named	
Those water bodies of the Commonwealth that comprise the Mississippi and Ohio River basins and sub-basins within the political and geographic boundaries of Kentucky	
in accordance with effluent limitations, monitoring requirements and other conditions set forth in this permit.	
This permit shall become effective on December 1, 2014.	
This permit and the authorization to discharge shall expire at midnight, November 30, 2019.	
November 21, 2014	
Date Signed	Peter T. Goodman, Director Division of Water
DEPARTMENT FOR ENVIRONMENTAL PROTECTION Division of Water, 200 Fair Oaks Lane, Frankfort, Kentucky 40601 <small>Printed on Recycled Paper</small>	

For full text of permit, see: <http://dep.ky.gov/formslibrary/Documents/KYR10PermitPage.pdf>

LFUCG Permit Checklist for Capital Projects In and Along Streams and Wetlands

- ❑ **US Army Corps of Engineers (US ACE) Clean Water Act Section 404 Permit**
 - Complete the attached checklist for **Nationwide Permit Coverage**. A permit application to US ACE is not necessary if all permit conditions are met. Otherwise, an individual permit application must be submitted to US ACE. **A written preconstruction notification must be submitted to US ACE regardless of the size of the project.**

- ❑ **Kentucky Division of Water (KDOW) Clean Water Act Section 401 Water Quality Certification**
 - Complete the attached checklist for the KY 401 Water Quality Certification

- ❑ **KY Permit to Construct In or Along a Stream**
 - Complete the KDOW stream construction permit application.
 - Submit the permit application to the LFUCG Floodplain Administrator in the LFUCG Division of Water Quality for review and signature.
 - Submit the signed permit application to the Kentucky Division of Water (KDOW).
 - Develop and implement an erosion and sediment control plan (can be combined with the Stormwater Pollution Prevention Plan if the project disturbs one or more acres).

- ❑ **KYR10, General Permit for Construction Activities** – This permit is required for projects that will disturb one or more acres of land.
 - Develop a Stormwater Pollution Prevention Plan and an LFUCG Erosion and Sediment Control Plan (these can be combined into a single plan). Templates are available on the KDOW and LFUCG web sites.
 - Submit an electronic Notice of Intent for KYR10 coverage to KDOW.
 - Implement the Stormwater Pollution Prevention Plan and keep it onsite.
 - File a Notice of Termination with KDOW once the area is stabilized.

- ❑ **LFUCG Land Disturbance Permit** – Submit the permit application and Erosion and Sediment Control Plan (or SWPPP) to the LFUCG Division of Engineering (DOE).

- ❑ **LFUCG Special Floodplain Permit** – This permit is required for the situations described in Article 19-8 of the LFUCG Zoning Ordinance. Appropriate documentation shall be submitted to the LFUCG Division of Engineering.

- ❑ **FEMA Requirements** – See document entitled “Summary of FEMA Requirements” on the LFUCG website.
- ❑ **US EPA Underground Injection Control** – This applies when stormwater is to be discharged into an improved sinkhole or a subsurface fluid distribution system. An inventory form must be submitted to US EPA and a copy submitted to DOE.

Links

U.S. Army Corps of Engineers Nationwide Permits

<http://www.lrl.usace.army.mil/Missions/Regulatory/Obtain-a-Permit/Nationwide/>

Kentucky Division of Water Clean Water Act Section 401 Water Quality Certification

<http://water.ky.gov/permitting/Pages/KYWaterQualityCertProg.aspx>

Kentucky Division of Water KYR10 Electronic Notice of Intent for Construction

<https://dep.gateway.ky.gov/eForms/default.aspx?FormID=7>

Kentucky Division of Water Permitting Information

<http://water.ky.gov/permitting/Pages/default.aspx>

Kentucky Division of Water Permit for Construction in the Floodplain

<http://water.ky.gov/floodplain/Pages/FloodplainConstruction.aspx>

US EPA Underground Injection Control

http://water.epa.gov/type/groundwater/uic/class5/comply_minrequirements.cfm

LFUCG Zoning Ordinance, Article 19 – Floodplain Conservation and Protection

<https://drive.google.com/file/d/0B0aBvWAKyfxacTlyWmhNcmk0aFU/view>

LFUCG Code of Ordinances, Chapter 16, Article X – Stormwater Discharges

[https://library.municode.com/ky/lexington-](https://library.municode.com/ky/lexington-fayette_county/codes/code_of_ordinances?nodeId=COOR_CH16SEGAREWE_ARTXS)

[fayette_county/codes/code_of_ordinances?nodeId=COOR_CH16SEGAREWE_ARTXS](https://library.municode.com/ky/lexington-fayette_county/codes/code_of_ordinances?nodeId=COOR_CH16SEGAREWE_ARTXS)
TDI

LFUCG Floodplain and Flood Management Information

<https://www.lexingtonky.gov/floodplains-and-flood-management>

US Army Corps of Engineers Nationwide Permit

US ACE Conditions for NWP Eligibility

Nationwide permits cover discharges of dredged or fill material into non-tidal waters of the United States for the construction or expansion of utilities, commercial and institutional building foundations, and building pads and attendant features that are necessary for the use and maintenance of the structures. Attendant features may include, but are not limited to, roads, parking lots, garages, yards, utility lines, storm water management facilities, wastewater treatment facilities, and recreation facilities such as playgrounds and playing fields.

The discharge must not cause the loss of greater than 1/2-acre of non-tidal waters of the United States, including the loss of no more than 300 linear feet of stream bed, unless for intermittent and ephemeral stream beds this 300 linear foot limit is waived in writing by the district engineer. **Preconstruction notification in writing to USACE is required for all activities.**

Special Conditions for All US ACE Nationwide Permits

- Projects cannot interfere with navigation.
- Activities cannot disrupt the life cycles or movement of aquatic life.
- Spawning areas must be avoided to the maximum extent practicable.
- Migratory bird breeding areas must be avoided to the maximum extent practicable.
- No trash, debris, car bodies, asphalt, toxic material, or other unsuitable materials are allowed.
- Work around water supply intakes is limited to work on the intake or stabilizing adjacent banks.
- Impoundments must minimize any adverse effects on aquatic systems and flows.
- Pre-construction flows must be restored after construction; work must withstand high flows.
- Fills within the 100-year floodplain must comply with state/local FEMA requirements.
- Heavy equipment working in wetlands or mudflats must be placed on mats.
- Appropriate erosion and sediment controls, including prompt stabilization, is required.

- Temporary fills must be removed and the area revegetated after work is completed.
- Any structure or fill must be properly maintained, to ensure public safety.
- Any activities in Wild and Scenic Rivers require special federal and state approval.
- Activities cannot jeopardize the continued existence of a threatened or endangered species.
- Activities affecting historic properties require special federal and state review and approval.
- Impacts to critical or special use water resources (e.g., Steeles Run in Fayette County) require special review.
- Mitigation may be required by US ACE for impacts to streams, wetlands, and other U.S. waters.
- US ACE permittees must comply with state water quality certification requirements.
- Each project must be permitted under a single nationwide permit.
- Permits may be transferred upon application to and approval of the US ACE.
- Permittees receiving NWP verifications must file a report on the work, including mitigation.
- Each activity must be a single and complete project, with coverage by the same permit.
- NWPs do not eliminate the need for other permits or grant any property rights or privileges.

Kentucky Division of Water Clean Water Act Section 401 Water Quality Certification Conditions for NWP Coverage

- The activity will not occur within surface waters of the Commonwealth identified by the Kentucky Division of Water as Outstanding State or National Resource Water, Cold Water Aquatic Habitat, or Exceptional Waters.
- The activity will impact less than 1/2 acre of wetland/marsh.
- The activity will impact less than 300 linear feet of impact to surface waters of the Commonwealth. Realignment of streams and in-stream stormwater detention/retention basins are not authorized under this general certification.
- The Kentucky Division of Water may require submission of a formal application for an individual certification for any project if the project has been determined to likely have a significant adverse effect upon water quality or degrade the waters of the Commonwealth so that existing uses of the water body or downstream waters are precluded.
- The activity will not occur within surface waters of the Commonwealth identified as perpetually-protected (e.g. deed restriction, conservation easement) mitigation sites.
- Activities that do not meet the conditions of this General Water Quality Certification require an Individual Section 401 Water Quality Certification.
- Projects requiring in-stream stormwater detention/retention basins shall require individual water quality certifications.
- Erosion and sedimentation pollution control plans and Best Management Practices must be designed, installed, and maintained in effective operating condition at all times during construction activities so that violations of state water quality standards do not occur.
- Sediment and erosion control measures, such as check-dams constructed of any material, silt fencing, hay bales, etc., shall not be placed within surface waters of the Commonwealth, either temporarily or permanently, without prior approval by the Kentucky Division of Water's Water Quality Certification Section. If placement of sediment and erosion control measures in surface waters is unavoidable, design and placement of temporary erosion control measures shall not be conducted in such a manner that may result in instability of streams that are adjacent to, upstream, or downstream of the structures. All sediment and erosion control devices shall be removed and the natural grade restored within the completion timeline of the activities.

- Measures shall be taken to prevent or control spills of fuels, lubricants, or other toxic materials used in construction from entering the watercourse.
- Removal of riparian vegetation in the utility line right-of-way shall be limited to that necessary for equipment access.
- To the maximum extent practicable, all in-stream work under this certification shall be performed under low-flow conditions.
- Heavy equipment, e.g. bulldozers, backhoes, draglines, etc., if required for this project, should not be used or operated within the stream channel. In those instances in which such in-stream work is unavoidable, then it shall be performed in such a manner and duration as to minimize turbidity and disturbance to substrates and bank or riparian vegetation.
- Any fill shall be of such composition that it will not adversely affect the biological, chemical, or physical properties of the receiving waters and/or cause violations of water quality standards. If rip-rap is utilized, it should be of such weight and size that bank stress or slump conditions will not be created because of its placement.
- If there are water supply intakes located downstream that may be affected by increased turbidity and suspended solids, the permittee shall notify the operator when such work will be done.
- Should evidence of stream pollution or jurisdictional wetland impairment and/or violations of water quality standards occur as a result of this activity (either from a spill or other forms of water pollution), the Kentucky Division of Water shall be notified immediately by calling (800) 928-2380.

Web Links for Further Information

- LFUCG Land Disturbance Permits, Engineering Manuals, Infrastructure Information
 - <https://www.lexingtonky.gov/new-development>
- LFUCG Stormwater, Water Quality, and Sanitary Sewer Programs
 - <https://www.lexingtonky.gov/browse/utilities-and-streets/water-quality>
- LFUCG Stormwater Manual
 - https://drive.google.com/file/d/0B_VhcJmdL_nhTThoZnJsWIBmZkk/view
- LFUCG Construction Inspection Manual
 - https://next.lexingtonky.gov/sites/default/files/2016-07/C_Entire_Manual.pdf
- LFUCG Code of Ordinances, Chapter 16, Article X – Stormwater Discharges
 - https://library.municode.com/ky/lexington-fayette_county/codes/code_of_ordinances?nodeId=COOR_CH16SEGAREWE_ARTXSTDI
- LFUCG Zoning Ordinance, Article 19 – Floodplain Conservation and Protection
 - <https://drive.google.com/file/d/0B0aBvWAKyfxacTlyWmhNcmk0aFU/view>
- LFUCG YouTube Video on Construction Site Erosion and Sediment Control
 - <https://www.youtube.com/watch?v=G4fsybuKOzA>
- LFUCG Floodplain and Flood Management Information
 - <https://www.lexingtonky.gov/floodplains-and-flood-management>
- LFUCG Introduction to Lexington’s Stormwater Management Program Video
 - <https://www.youtube.com/watch?v=GIP17IP7cYE>
- Kentucky Erosion Prevention and Sediment Control Field Guide
 - http://www.kyt2.com/assets/files/uploads/09fieldguide_final.pdf
- Kentucky Best Management Practices (BMPs) for Controlling Erosion, Sediment, and Pollutant Runoff from Construction Sites: Technical Specifications Manual
 - http://www.kyt2.com/assets/files/uploads/09bmpmanual_final.pdf
- Kentucky Division of Water Clean Water Act Section 401 Water Quality Certification
 - <http://water.ky.gov/permitting/Pages/KYWaterQualityCertProg.aspx>
- Kentucky Division of Water KYR10 Electronic Notice of Intent for Construction
 - <https://dep.gateway.ky.gov/eForms/default.aspx?FormID=7>
- Kentucky Division of Water Permitting Information
 - <http://water.ky.gov/permitting/Pages/default.aspx>
- Kentucky Division of Water Permit for Construction in the Floodplain
 - <http://water.ky.gov/floodplain/Pages/FloodplainConstruction.aspx>
- Kentucky Division of Compliance Assistance SWPPP Examples
 - <http://dca.ky.gov/DCA%20Resource%20Document%20Library/StormwaterPollutionPreventionPlanExample.pdf>
 - <http://dca.ky.gov/DCA%20Resource%20Document%20Library/Storm%20Water%20Pollution%20Prevention%20Plan%20Sample.pdf>
- U.S. Army Corps of Engineers Nationwide Permits
 - <http://www.lrl.usace.army.mil/Missions/Regulatory/Obtain-a-Permit/Nationwide/>
- US EPA Developing Your Stormwater Pollution Prevention Plan: A Guide for Construction Sites
 - https://www3.epa.gov/npdes/pubs/sw_swppp_guide.pdf
- US EPA Construction SWPPP Template
 - https://www3.epa.gov/npdes/pubs/sw_swppp_template_authstates.doc