SOIL EROSION AND SEDIMENTATION CONTROL PROCEDURES
for the
_____ COUNTY ROAD COMMISSION
(date)

INTRODUCTION

All requirements of Part 91, Soil Erosion and Sedimentation Control (SESC), of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (Part 91), and the administrative rules promulgated under the authority of Part 91 are included in this procedure by reference.

This procedure is adopted as a working document; its contents are intended to serve as guidance for all activities of the _____ Road Commission (hereafter referred to as the Agency), falling under the jurisdiction of Part 91. A copy of this procedure is provided to all Agency and contracted personnel engaged in any aspect of SESC. Those personnel are expected to understand and implement the contents of this procedure. Standards and specifications referenced in this procedure are available to all Agency and contracted personnel.

The goal of the Agency is an effective and economical SESC program to protect the soil, water, and other natural resources of _____ County. Controlling erosion and off-site sedimentation is a high priority for all maintenance and new construction projects undertaken by, or performed under contract for, this Agency.

The Agency will anticipate and plan for potential SESC problems associated with all phases of a project, including clearing, rough grading, construction, final grading, restoration, and continuing site maintenance. All earthwork for construction or heavy maintenance projects is performed in accordance with a comprehensive SESC plan which meets the requirements of Rule 323.1703. Routine maintenance projects will be done in accordance with a comprehensive SESC plan or with established maintenance guidelines referenced in this procedure.

The SESC procedures of the Agency are subject to review by Agency staff and the Michigan Department of Environmental Quality (MDEQ). Procedures will be revised as standards and techniques for SESC evolve. Any revisions to the procedures must be reviewed and approved by the MDEQ prior to formal adoption.

All Agency personnel who make decisions regarding the design, inspection, or implementation of SESC measures must complete the MDEQ's SESC training and pass the final exam. This includes personnel in the following positions:

_____

(Please indicate the appropriate position titles, such as manager, supervisor, engineer, foreman, inspector, etc. There may be one position or there may be several; you tell us.)

STANDARDS AND SPECIFICATIONS

The most recent versions of the documents listed below are available at the Agency, are routinely consulted by all staff, and guide the implementation of SESC measures:

1. Michigan Department of Transportation Specifications for SESC, including:
    a. The most recent edition of *Standard Specifications for Construction*
    b. Soil Erosion and Sedimentation Control Measures, *Standard Plan R-96-C,* or subsequent revisions
    c. *Soil Erosion and Sedimentation Control Manual*

2. Michigan Department of Environmental Quality, *Guidebook of Best Management Practices for Michigan Watersheds.*

3. The manufacturer's standards and specifications for SESC products

THE SOIL EROSION AND SEDIMENTATION PROCESS

Soil erosion is classified as either natural or accelerated. Natural erosion is a geological process facilitated by time, climate, and other environmental site conditions, which proceeds relatively independently of human activity. Accelerated soil erosion is a result of human activity. After soil has been exposed or topography altered, wind or moving water can rapidly move sediments into water bodies or onto adjacent property. Accelerated erosion and off-site sedimentation must be prevented during and after construction and maintenance activities.

Base erosion potential is the amount of erosion expected from a site after vegetation has been removed. Whenever and wherever possible, avoid construction or soil disturbance in locations with a high base erosion potential or a preexisting natural erosion condition. Such sites logically possess high-accelerated erosion potential; seek viable sites with lower erosion potential as alternatives.

The Agency will utilize slope and soil information to estimate the base erosion potential of the site. Information will be obtained from the county soil survey, topographic maps, and on-site analysis. The Revised Universal Soil Loss Equation (RUSLE) or other commonly accepted methods will be used in determining the project route and prescribing SESC measures.

The scheduling of a project, with respect to the growing season and accepted seeding dates, will be considered when selecting SESC measures for a project. Liberal use of erosion control blankets, securely anchored mulch, or other erosion resistant materials will be used when a project extends beyond the growing season.

PRINCIPLES OF SESC

The Agency recognizes seven basic principles of SESC:

1. Design and construct terrain features, such as slopes and drainageways, to minimize the erosion potential of the exposed site. Consider soil type, time of year, proximity to waterways, duration of exposure, length and steepness of the slope, and the anticipated volume and intensity of runoff.

2. Minimize the area of unstabilized soils left unprotected from runoff and wind.

3. Minimize the amount of time areas of unstabilized soils are exposed to erosive forces.

4. As soon as it is practical after earth disturbance, protect exposed soils with temporary or permanent vegetation, mulch, or other approved erosion resistant material.

5. Avoid concentrating runoff. If concentrated runoff is unavoidable, implement measures to reduce runoff to a non-erosive velocity.

6. Trap eroded sediments on-site with temporary and permanent barriers, basins, or other sediment retention measures and allow for the controlled discharge of runoff at a non-erosive velocity.

7. Implement a continuous inspection and maintenance procedure, which includes written documentation of the SESC actions.

The foregoing principles guide the SESC decisions of the Agency during planning, design, and installation for both construction and maintenance sites and during the performance of routine maintenance tasks.

PLANNING AND DESIGN

Effective SESC begins with planning, including locating projects to best meet each project objective while minimizing the potential for erosion.

Minimize the number of stream crossings to reduce disturbance to streams and protect water quality. When a stream crossing is necessary, locate it at a stable reach of the stream and either at a right angle to the direction of flow or so the culvert or waterway opening is aligned to accommodate the natural course of the stream. If possible, avoid project locations which encroach on lakes, streams, floodplains, or wetlands. Structures placed below the ordinary high water mark, encroachments into floodplains, potential impediments to navigation or riparian rights, or changes to channel characteristics must have approval of local, state, or federal authorities as appropriate.

Develop a comprehensive SESC plan in accordance with Rule 323.1703 for incorporation into the design plans for all phases of all projects. Clearly show the scope, location, and installation details for all SESC measures on the plans, in the specifications, and in the special guidelines for in-house or contracted construction and maintenance projects. Provide a section in the plans to list miscellaneous quantities of SESC materials to address unanticipated control requirements. In addition, include a construction sequence which specifically schedules the installation and maintenance requirements of each temporary and permanent SESC measure included in the design.

Emphasize the placement and maintenance of both temporary and permanent SESC measures on plans and guidelines, and handle as bid items in contracts when feasible. Contracts will specify that temporary SESC measures shall be installed prior to, or upon commencement of, earth change activity and shall be removed only after permanent SESC measures are in place and the site is stabilized. Permanent SESC measures shall be in accordance with the manufacturer's specifications and the guidelines set forth in the standards and specifications adopted by the Agency.

Install permanent SESC measures for all slopes, channels, ditches, or any disturbed land area within five (5) calendar days after final grading or completion of the final earth change. If permanent stabilization of a disturbed area is not possible upon completion of an earth change, maintain temporary SESC measures until the site is stabilized.

Select horizontal and vertical alignments of rights-of-way to avoid critically erodible sites along the proposed route and minimize disturbance to surface and groundwater flows. Alignments will be consistent with safety criteria and, to the extent possible, fit into the natural landscape to reduce the number and size of cuts and fills.

Control the concentration of water on slopes with infiltration areas, intercepting ditches, diversion berms, or drop structures with stable outlets. Reduce the concentration and velocity of runoff by use of horizontal surface roughening, reduction of effective slope length, and the prompt installation of mulch, geotextile, or other appropriate surface covering.

Design ditches and channels with the flattest side slopes permitted by the right-of-way (preferably 3H:1V, or flatter) and broad, flat or rounded bottoms. Channels shall be vegetated or armored with geotextile, riprap, or other suitable material as necessary to prevent erosion at anticipated flows.

Place check dams, sediment traps, or both, in combination to reduce runoff velocity and trap sediments in unstabilized ditches or channels. These devices may be either temporary or permanent, depending on the conditions at the site. Plans must include a routine inspection and maintenance schedule. Structures designed to trap sediments shall be cleaned out to full capacity when found to be 50 percent full and the sediment removed to an approved upland disposal site. Maintain check dam integrity and contours to ensure runoff does not create erosion by undermining or travelling around the ends of the structures.

Culverts and other structures placed in channels often constrict flood flows, increase water velocity, and increase the potential for erosion. In situations with such potential, protect the culvert or structure embankment slopes and the downstream channel and banks with riprap or other erosion resistant material. Design road crossings to locate culverts, bridges, or other in-stream structures to minimize changes to channel cross-section and orientation.

CONSTRUCTION

All phases of construction and in-house maintenance, including the installation and maintenance of SESC measures, will follow the schedule prescribed in the SESC plan or maintenance guidelines. The first step in the construction sequence is the placement of SESC measures around the perimeter of the proposed earth change to effectively prevent sediment from entering any lake, stream, wetland, or adjacent property. The construction sequence is completed by the conversion of temporary SESC measures to permanent controls and full stabilization of soils on the site.

Schedule and perform clearing operations to permit the timely and sequential installation of SESC measures. The maximum area of erodible soils exposed at any time will be based on site characteristics and stated in the phasing, staging, and sequencing section of plans or guidelines.

If embankment slopes terminate near a lake or stream, maintain or establish a protective buffer of vegetation between the water body and the disturbed area whenever feasible. Place silt fence or an equivalent SESC treatment at the toe of the disturbed portion of the embankment; additional courses of silt fence may be required along intermediate contours of long or steep slopes.

Perform all maintenance and new construction operations in the dry by placing cofferdams or similar structures around work done below the ordinary high water mark or legally established level of a lake.

When a temporary diversion channel is used, slopes of the channel must be stabilized with vegetation or erosion resistant materials before water is released to the channel. Install sediment traps, check dams, or filters in the channel to remove sediments from runoff which may leave the site or discharge to a water body.

Locate all stockpiles, waste material, and spoils in upland areas where they can be properly contained and will not erode into water bodies or on to adjacent properties.

Conduct site restoration and stabilization in a manner that ensures adequate temporary or permanent SESC measures are in place and functioning at the end of each workday.

INSPECTIONS

Agency personnel who have successfully completed the SESC training required by Section 9123 of Part 91 and passed the final exam are responsible for inspecting and documenting the condition of the SESC measures on a daily basis and initiating changes or maintenance if required.

Violations or problems with SESC measures are corrected immediately and both the problem and the corrective action are documented in an inspection report. General oversight and ultimate responsibility for inspections and compliance of all Agency operations resides with the Agency manager.

MAINTENANCE OF CONTROL MEASURES

Maintenance includes implementing necessary repairs or corrections to existing temporary or permanent SESC measures. Temporary SESC measures shall be maintained daily; permanent measures in need of repair shall be corrected within five (5) days of detection of the problem, unless the scope of the work or the season prevents such action. Implement temporary measures immediately to contain sediments from failed permanent measures and maintain temporary measures until the permanent measures are repaired.

Apply seed and mulch or plant other ground stabilizing vegetation immediately following final grading on all disturbed sites where the slopes are gentle enough to allow their effective use. Vegetative treatments shall follow guidelines published in the documents referenced elsewhere in this procedure. Use staked sod, geotextiles, riprap, or other suitable erosion control materials, as necessary, on steep slopes or other areas unsuitable for standard vegetative treatments. Length of slope, soil characteristics, and access for maintenance will influence the maximum slope suitable for standard vegetative treatments. Any slope steeper than 2H:1V should have structural treatments to reinforce or replace vegetation. Slopes steeper than 3H:1V *may* require structural treatments depending on site conditions. Use all products in accordance with the manufacturer's specifications.

MAINTENANCE CONSTRUCTION (HEAVY MAINTENANCE)

Plans are developed and SESC measures are implemented for maintenance construction and heavy maintenance in the same manner as for new construction. Plans shall meet the requirements set forth in Rule 323.1703. Inspect and document site conditions and maintain SESC measures on maintenance construction and heavy maintenance projects in the same manner as for new construction.

ROUTINE MAINTENANCE

Routine maintenance activities are subject to the same general SESC considerations as new construction or heavy maintenance. Typical routine maintenance tasks include, but are not limited to, the following:

- Road and shoulder grading
- Roadside ditch clean-out
- Cross drainage culvert, underdrain, bridge approach, and embankment repair or replacement
- Slope protection and washout repair

In lieu of developing formal SESC plans, the Agency will undertake the above listed activities in accordance with the following guidelines:

Road and Shoulder Grading

a) For roads with ditches, grade to allow runoff to enter the ditch at points no closer than 100 feet from a lake or stream; this may require removal of berms formed between the road and the ditch.

b) For roads without ditches, construct outlets to natural depressions or excavated sumps which allow runoff to leave the road at points no closer than 100 feet from a lake or stream.

c) Conduct road grading operations adjacent to or crossing any watercourse in a manner which does not allow graded materials to enter directly or be carried by runoff into the watercourse. Direct road drainage to areas which allow runoff to filter through a vegetative buffer prior to entering any watercourse.

Roadside Ditch Clean-Out

a) Conduct ditching operations in the dry or in periods of low water flow.

b) Leave at least 50 feet of natural vegetation between the terminus of ditching and any lake or stream.

c) If existing vegetation is inadequate to filter sediments from runoff, install temporary or permanent check dams, sediment traps, or both.

d) If it is necessary to remove the vegetated filter described in (a), do so only after the remainder of the ditch is revegetated and stabilized.

e) Protect ditches with long slopes by leaving 20-foot long natural vegetation filters or constructing check dams at intervals not exceeding 2-feet of vertical drop or at lesser intervals if conditions dictate.

f) Where possible, salvage topsoil and replace immediately upon completion of the ditching project or within five (5) days of earth disturbance on any portion of the project, whichever is less. Seed and mulch ditches within five (5) days of final grade.

Cross-Drainage Culvert, Underdrain, Bridge Approach, and Embankment Repair

a) Isolate all work from flowing water.

b) Stabilize culvert ends and areas below annual high water levels with riprap over geotextile or other suitable erosion resistant materials.

c) Stabilize all disturbed areas above the annual high water mark with sod, seed, mulch, or other suitable erosion resistant material within five (5) days of final grade.

d) Acquire all applicable permits from the Department of Environmental Quality under the provisions of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended.

Slope Protection and Washout Repair

a) Isolate all work from flowing water.

b) Immediately stabilize all disturbed areas with sod, seed, mulch, or other erosion resistant materials.

c) Divert water flow away from the top of the slope or convey water downslope with a properly designed downdrain with a stable outlet until the area is stabilized.

d) Additional SESC measures may be required for work on steep slopes or slopes located near lakes or streams.

COMPLIANCE AND ENFORCEMENT

The Agency is ultimately responsible for SESC practices undertaken by contractors working under the authorized public agency designation. Therefore, all contractors shall comply with this operating procedure. The Agency shall ensure that contracts include clear language describing the responsibility of contractors to comply with the operating procedure, the authority of the Agency to enforce compliance with the operating procedure, and the consequences for noncompliance.

Contractor compliance can be assured with contract language including, but not limited to, the following:

- Include separate line item values for the construction, installation, maintenance, and removal of temporary and permanent SESC measures. Failure to implement SESC per the contract will result in withholding payment, stopping work, or using the line item value to pay another company to implement SESC.

- The acquisition of a bond or letter of credit and implementation of actions comparable to those authorized by section 9119 of Part 91.

- The ability of the Agency to impose fines and assess the cost of actual damage if the contractor does not comply with the SESC requirements of the contract or Part 91.