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The
University of Michigan
**Soil Erosion & Sedimentation Control
Procedures**

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Table of Contents

INTRODUCTION.....	1
AUTHORIZED PUBLIC AGENCY AUTHORITY	1
SESC PLAN.....	2
MINIMUM PLAN REQUIREMENTS (RULE 323.1703).....	3
MINIMUM PLAN REQUIREMENTS FOR SMALL CONSTRUCTION PROJECTS.....	4
MAINTENANCE ACTIVITY PLANS	5
PLANNING & DESIGN.....	8
PLANNING FOR CONSTRUCTION	10
DESIGNING FOR CONSTRUCTION	10
CONSTRUCTION SEQUENCE.....	11
BEST MANAGEMENT PRACTICES.....	13
RESPONSIBILITIES OF U-M DEPARTMENTS.....	15
INSPECTIONS	17
NOTIFICATIONS TO OUTSIDE AGENCIES	18
NOTIFICATIONS WITHIN U-M	18
PENALTIES FOR NON-COMPLIANCE	19
TECHNICAL SUPPORT.....	19
REFERENCE MATERIAL.....	20
GLOSSARY.....	21
APPENDICES	22
APPENDIX A – PROJECT NOTIFICATION FORM.....	-
APPENDIX B – DESIGN & REVIEW CHECKLIST FOR SESC PLANS	-
APPENDIX C – FIELD INSPECTION REPORT	-
APPENDIX D – PREFERRED SESC DESIGN ELEMENTS	-
APPENDIX E – REGULATIONS IN BRIEF.....	-

Introduction

Erosion is defined as the process by which the land surface is worn away by the action of wind, water, ice or gravity. Soil particles are dislodged or detached and set into motion. **Sedimentation** is defined as the process whereby the detached particles generated by erosion are deposited on land or into water bodies, such as lakes, streams and wetlands. Accelerated soil erosion is a result of human activities and occurs after soils have been exposed or runoff patterns altered. This type of erosion comprises 70% of all sediment generated in the U.S. Sediment discharged into U.S. rivers is estimated at 4.5 billion tons annually.

Accelerated erosion should be minimized during and following all construction and maintenance activities. The movement of sediments through the storm water system creates two primary concerns for waterways. The first is sediment buildup in the waterways which alters the natural ecosystem. The second concern is pollutants carried with the sediments which can create toxicity problems in the water.

The University of Michigan (U-M) has established the Storm Water Management Plan (SWMP) and the Soil Erosion & Sedimentation Control (SESC) Procedures to control the quality of storm water runoff from development or redevelopment activities on University properties. These procedures detail the University's efforts to prevent off-site discharge of sediment to Waters of the State, storm drains and to adjacent properties.

The U-M SESC procedures target soil erosion prevention and associated sediments during all earth change activities associated with development, redevelopment and maintenance activities. Plans for new development are subjected to a U-M internal review process to ensure that storm water quality is adequately controlled during construction and after completion of the new development. Storm water management and soil erosion and sedimentation controls are required to be incorporated into the front end of all projects.

Authorized Public Agency Authority

In 1982, the U-M received approval from the Michigan Department of Natural Resources to operate as an Authorized Public Agency (APA) under the authority of Part 91, Soil Erosion and Sedimentation Control (SESC) of the Natural Resource & Environmental Protection Act, 1994 PA 451, as amended (Part 91). APA status allows the U-M to establish and manage the Soil Erosion and Sedimentation Control procedures on its properties. U-M Dearborn (UMD) and U-M Flint (UMF) each have a designated representative (Campus Safety / OSEH – UMD; Environment, Health & Safety – UMF) working with their respective campuses to manage the

approved U-M SESC procedures. OSEH representatives from U-M Ann Arbor (UMA2) manage the approved U-M SESC procedures on the Ann Arbor campus and on all other properties within the state. **All requirements of Part 91 and the administrative rules promulgated under Part 91 are included in these procedures by reference.**

SESC Plan

The SESC procedures apply in varying degrees to construction and maintenance activities at the U-M conducted by contractors and in-house personnel. The need for and extent of a formal written soil erosion control plan will vary, depending on the project.

Earth disturbances not stabilized within 24 hours of the initial earth disturbance and which are not exempted under MI Part 17 SESC Rule 323.1705, meeting either of the following criteria require a fully developed, written, erosion and sediment control plan that complies with Part 91:

- Earth disturbances of 1 acre or more.
- Earth disturbances within 500 feet of “Waters of the State”

GLOSSARY DEFINITION

“Waters of the State”

. . .includes the Great Lakes and their connecting waters, lakes, ponds, and streams which may or may not be serving as a county drain as defined by the drain code; or any other body of water that has definite banks, a bed, and visible evidence of a continued flow or continued occurrence of water and wetlands regulated under part 303.

If the project meets any of the criteria above, go to the Minimum Plan Requirements (Rule 323.1703) section of this document for additional information.

All other projects must maintain methods to control runoff that enters the existing storm water system and protects it from sedimentation. Refer to the Minimum Plan Requirements for Small Construction Projects (less than 1 acre and greater than 500 feet from “Waters of the State” as defined in the glossary) section of this document for additional information.

Minimum Plan Requirements (Rule 323.1703)

Minimum plan requirements apply to 1) all earth changes within 500 feet of “Waters of the State” as defined in the Glossary and/or 2) all earth changes of 1 acre or greater. Calculate the total area of the site (to the nearest 0.1 acre) and the total area of earth disturbance (to the nearest 0.1 acre). Provide these calculations to OSEH, on the Project Notification Form (Appendix A), to demonstrate what SESC requirements apply to the project.

The preliminary SESC plan shall be prepared by the designer, and reviewed for approval by SESC trained staff from Plant Extension – University Planner’s Office and OSEH.

The plan will consist of a scaled map (at a scale of not more than 200 feet = 1 inch) and address, at a minimum, the following 12 items:

1. Legal description.
2. Site location sketch.
3. Proximity of any proposed earth change to waters of the state.
4. Predominant land features including lakes, streams and wetlands.
5. Contour intervals or slope information.
6. A soils survey or a written description of the soil types of the exposed land area contemplated for the earth change.
7. Description and location of physical limits of each proposed earth change.
8. Description and location of existing and proposed on-site drainage and dewatering facilities.
9. Timing and sequence of each proposed earth change.
10. Description and location of all temporary erosion and sedimentation control measures, including timing on installation and removal of temporary measures.
11. Location and description for installing permanent erosion and sedimentation control measures.
12. Program and schedule for maintaining all control measures.

A design and review checklist containing these twelve required plan items is provided in Appendix B.

Minimum Plan Requirements for Small Construction Projects

Minimum plan requirements for small construction projects apply to earth change projects less than one acre in size which are greater than 500 feet from “Waters of the State” as defined in the Glossary. These small construction projects may not require a SESC plan, but must use the appropriate SESC measures/BMPs during activity that disturbs soil to the point where sediment transport could occur. The following process should be followed for these projects:

- Evaluate the site to determine the location of the nearest storm water drainage system.
- Determine if soil will be excavated or disturbed during the construction activity.
- Install SESC measures/BMPs around the perimeter of the site and on adjacent roadways. Use silt fencing to control incidental release of sediment to the storm water system during the maintenance activity.
- Install temporary inlet filters at all adjacent and down-gradient storm water inlets, catch basins and manholes that may be impacted.
- Place stockpiles and other spoil piles away from the drainage system to minimize sediment transport. If the stockpile and/or spoil pile must remain on-site overnight, or if the weather conditions indicate the chance for precipitation, a) cover the pile with water repellent material to prevent erosion and/or b) install silt fencing around the base of the pile to prevent transport of sediment to the storm water system, or apply other control methods appropriate to the site. Control measures to guard against wind erosion must also be employed, such as wetting or covering the stockpiles. Keep as few stockpiles as possible during the course of the project.
- Remove any unused soil from the site as soon as the activity is completed.
- Contact UM Grounds & Waste Management (G&WM) (UMD & UMF contact Facilities Management), two (2) weeks in advance of the expected date of completion, so they can prepare to grade and re-vegetate the work area immediately after project completion. Projects completed outside of the growing season must have temporary SESC measures/BMPs (such as erosion control blankets, mulch or an alternative method approved by OSEH) installed until re-vegetation efforts can be completed during the growing season.
- Remove all temporary erosion and sediment control devices from the site once work is completed and vegetation has been established.

Maintenance Activity Plans

Maintenance activities, disturbing less than one acre and greater than 500 feet from “Waters of the State” as defined in the Glossary, do not typically have a design or specification prepared. These activities are performed on a work order or emergency basis by Plant Operations or other U-M departments such as U-M Hospitals & Health Centers (UMHHC) or Athletics. The supervisor of the maintenance activity, shall notify the OSEH SESC inspector of the proposed activity and shall arrange for OSEH inspections to ensure appropriate erosion control and sediment control measures are implemented during fieldwork.

Maintenance activities within 500 feet of “Waters of the State” or disturbing 1 acre or greater are considered construction/renovation projects and require fully developed SESC plans. Refer to the Minimum Plan Requirements (Rule 323.1703) section of this document for additional information.

These procedures will be used for routine operations; however, in emergency situations, the safety and operation of the facilities and infrastructure is of overall importance. In those cases, the work will be performed to minimize facility impairment and stabilize the situation and erosion control and sedimentation control measures will immediately follow. This may require using a contractor to clean the storm water system following the emergency actions, to minimize sediment transport to nearby waterways, or to remove sediment if it reaches a waterway. Notify OSEH (Ann Arbor 734/647-1143; Dearborn 313/593-5333; Flint 810/766-6763) for SESC assistance during emergency maintenance activities.

At a minimum, the maintenance supervisor will use the following process during any activity that disturbs soil to the point where sediment transport could occur:

- Evaluate the site to determine the location of the nearest storm water drainage system.
- Determine if soil will be excavated or disturbed during the maintenance activity.
- Contact UM G&WM (UMD & UMF contact Facilities Management), in advance, and provide the expected date of completion, so they can prepare to grade and re-vegetate the work area immediately after project completion. Projects completed outside of the growing season must have temporary SESC measures/BMPs (such as erosion control blankets, mulch or an alternative method approved by OSEH) installed until re-vegetation efforts can be completed during the growing season.

- Install SESC measures/BMPs around the perimeter of the site and on adjacent roadways. Use silt fencing to control incidental release of sediment to the storm water system during the maintenance activity.
- Install temporary inlet filters at all adjacent and down-gradient storm water inlets, catch basins and manholes that may be impacted.
- Place stockpiles and other spoil piles away from the drainage system to minimize sediment transport. If the stockpile and/or spoil pile must remain on-site overnight, or if the weather conditions indicate the chance for precipitation, a) cover the pile with water repellent material to prevent erosion and/or b) install silt fencing around the base of the pile to prevent transport of sediment to the storm water system, or apply other control methods appropriate to the site. Control measures to guard against wind erosion must also be employed, such as wetting or covering the stockpiles. Keep as few stockpiles as possible during the course of the project.
- Remove any unused soil from the site as soon as the maintenance activity is completed.
- Remove all temporary erosion and sediment control devices from the site once work is completed and vegetation has been established.

Typical maintenance activities that may involve earth disturbance include, but are not limited to the following. The SESC measures/BMPs listed for each activity are in addition to those listed above.

Ditch clean out.

- Commence ditching no closer than 500 feet from “Waters of the State” as defined in the Glossary. Ditching activities within 500 feet of a waterway require a fully developed, written, erosion and sediment control plan that complies with Part 91. Refer to the Minimum Plan Requirements section for details.
- Install SESC measures/BMPs around the perimeter of the site and on adjacent roadways. Use silt fencing to control incidental release of sediment to the storm water system during the maintenance activity.
- Install temporary inlet filters at all adjacent and down-gradient storm water inlets, catch basins and manholes that may be impacted.
- Install temporary or permanent check dams or sediment traps if existing vegetation is inadequate, to prevent discharge of sediment. Check dams

should be spaced so that the toe of the upstream dam is at the same elevation as the top of the downstream dam.

- Complete ditching and stabilize other parts of the ditch before removing the 500 feet of vegetation nearest the surface water. A SESC plan is required for removing the 500 feet nearest the surface water.
- Replace topsoil and mulch and stabilize all exposed earth with protective landscaping such as hydroseed, sod, mulch, or other erosion resistant materials to prevent runoff.

Culvert drainage and under drain repairs or replacements.

- Sites within 500 feet of “Waters of the State” as defined in the Glossary, require a fully developed, written, erosion and sediment control plan that complies with Part 91. Refer to the Minimum Plan Requirements section for details.
- Isolate all work from flowing water. Use diversions, or if low flow conditions exist, plug lines, as appropriate.
- Install SESC measures/BMPs around the perimeter of the site and on adjacent roadways. Use silt fencing to control incidental release of sediment to the storm water system during the maintenance activity.
- Install temporary inlet filters at all adjacent and down-gradient storm water inlets, catch basins and manholes that may be impacted.
- Stabilize culvert and drain ends with erosion resistant materials such as riprap or concrete, as appropriate.
- Stabilize all exposed earth with protective landscaping such as seeding, sod, hydroseed mulch, or other erosion resistant materials.

Slope and embankment protection and washout repair.

- Sites within 500 feet of “Waters of the State” as defined in the Glossary require a fully developed, written, erosion and sediment control plan that complies with Part 91. Refer to the Minimum Plan Requirements section for details.
- Isolate all work from flowing water. Use diversions, or if low flow conditions exist, plug lines, as appropriate.
- Maintain a water diversion away from the slope until the area soils are stabilized.

- Complete work and stabilize all exposed earth with protective landscaping such as hydroseed, sod, mulch, or other erosion resistant materials.

Underground utility repairs and replacement.

- Install temporary inlet filters at all adjacent and down-gradient storm water inlets, catch basins and manholes that may be impacted.
- Isolate work from flowing water to maximum extent possible. Use diversions, or if low flow conditions exist, plug lines, as appropriate.
- Contact UM Grounds & Waste Management (G&WM) (UMD & UMF contact Facilities Management), in advance, and provide the expected date of completion, so they are prepared to grade and re-vegetate the work area, immediately after project completion. Projects completed outside of the growing season must have temporary SESC measures/BMPs (such as erosion control blankets, mulch or an alternative method approved by OSEH) installed until re-vegetation efforts can be completed during the growing season.
- Place stockpiles and other spoil piles away from the drainage system to minimize sediment transport. If the stockpile and/or spoil pile must remain on-site overnight, or if the weather conditions indicate the chance for precipitation, a) cover the pile with water repellent material to prevent erosion and/or b) install silt fencing around the base of the pile to prevent transport of sediment to the storm water system, or apply other control methods appropriate to the site. Control measures to guard against wind erosion must also be employed, such as wetting or covering the stockpiles. Keep as few stockpiles as possible during the course of the project.
- Remove unused soil from the site as soon as possible.

Planning & Design

The project/design team is responsible for preparing the soil erosion and sedimentation control plans, specifications, and time frames of implementation. The General Contractor is required to follow all local, state and federal regulations pertaining to the work being performed, per the general conditions section of U-M contracts. This includes complying with applicable soil erosion and sedimentation control requirements. The contractor will include all costs in their bid package for complete implementation of the soil erosion and sedimentation control plan including

required monitoring and maintenance during construction and final removal as directed in the plans.

Plans for soil erosion and sedimentation control must be submitted to the Plant Extension – University Planner’s Office and to the OSEH office for review and approval. Approval of the plans must be received prior to beginning any site work.

The following principles will guide the soil erosion and sedimentation control decisions of U-M during planning, design, installation, and monitoring of both construction and maintenance projects:

- Design and construct terrain features such as slopes and drainage ways based on natural contours, soil type, proximity to waterways, duration of exposure, length and steepness of the slope, and anticipated volume and intensity of the runoff.
- Minimize the area of unstabilized soils vulnerable to runoff and wind erosion by appropriate staging of construction and stabilization activities.
- Minimize the time that unstabilized soil areas are exposed to erosion by appropriate staging of construction and stabilization activities.
- Protect exposed soil areas during periods of construction. If the stockpile / spoil pile must remain on-site overnight, or if the weather conditions indicate the chance for precipitation, a) cover the pile with water repellent material to prevent erosion and/or b) install silt fencing around the base of the pile to prevent transport of sediment to the storm water system, or apply other control methods appropriate to the site. Control measures to guard against wind erosion must also be employed, such as wetting or covering the stockpiles. Keep as few stockpiles as possible during the course of the project. Place stockpiles and other spoil piles away from the drainage system to minimize sediment transport.
- Avoid concentrating runoff into one area or reduce the runoff to non-erosive velocities.
- Trap eroded sediments on site using temporary or permanent barriers, basins, or other devices.
- Manage control measures through a written inspection and maintenance program.
- Sediment control should not be used as a substitute for erosion control, but rather in conjunction with erosion control.

Planning for Construction

Every project should follow good practices for erosion and sediment control. Planning measures include:

- Evaluate the geology and soils of the site to observe potential problem areas and anticipate subsidence, slide or highly erodible areas. Perform a preliminary soil evaluation to identify and minimize potential serious erosion problems. Erosion potential is the amount of erosion expected to occur after vegetation has been removed. Soil type, slope characteristics, and surface drainage patterns are all major factors to evaluate. The erosion potential must be identified and used to plan specific erosion and sediment control measures.
- Plan water crossings for bridges, culverts, and utility transmission devices at a stable area of the water body and at right angles to the direction of flow. Minimize the number of crossings to reduce stream disturbance and protect water quality. Avoid alternatives encroaching on a water body, if possible, and coordinate with OSEH over wetland areas.
- Schedule clearing operations so that grading and erosion and sediment control measures can be installed sequentially, and in a timely manner.

Designing for Construction

Include soil erosion and sediment control measures in all phases of construction. Construction should begin by placing appropriate control measures along the perimeter of the site and at storm water inlets. The control actions should proceed through the various phases of construction. The construction should finish with conversion of temporary measures to permanent control structures, if necessary, and stabilization of all exposed soils.

Examples of design elements for control of soil erosion and sedimentation include:

- Silt fencing at the limit of the disturbed area.
- Temporary inlet filters at all adjacent and down-gradient storm water inlets, catch basins and manholes that may be impacted.
- Preservation of vegetative sediment buffers when possible.
- Provide an anti-tracking pad at site access points. The pad should be underlain with fabric and provide the specified depth of aggregate, per approved plans.

- Provide for a sweeper to remove sediment tracked onto the pavement on a daily basis. In addition, sweepers must be used more frequently, as needed, based on site conditions.
- Design horizontal and vertical alignments to minimize soil erosion from the site. These alignments should be consistent with safety criteria, fit into the natural landscape, and minimize the number and size of cuts and fills.
- Vary slope cross sections to minimize erosion potential, and to facilitate safety and drainage. Water accumulation at the top of slopes can be controlled with infiltration area intercepting ditches, diversion berms, or drop structures. The velocity of runoff on side slopes should be minimized using horizontal surface roughening, reducing effective slope length, or installing geotextile coverings. Designs should be carefully evaluated to prevent slope failure.
- Design ditches and channels with the flattest side slopes allowed by the right-of-way and broad, rounded bottoms. Gradual variations should be used when altering channel alignment to reduce potential bank erosion. All or portions of the channel can be lined with erosion resistant materials if erosion is anticipated.
- Dissipate high velocity flow at culvert outlets or protect the bank and channel surfaces with erosion resistant materials. Culverts should be located so that minimal changes occur to the channel surfaces or orientations.
- Place check dams, sediment traps, or both in unstabilized waterways or roadside ditches to reduce runoff velocity and trap sediments caused by upstream erosion. These devices may be either temporary or permanent, depending on the extent of unstabilized channel soils and project phase. The plan should provide for periodic maintenance and removal of accumulated sediments. Sediment control devices need to be cleaned as often as necessary to maintain effectiveness.
- Protect embankment slopes that encroach on surface water against erosion and sediment runoff. Where practical, a protective buffer of vegetated cover should be maintained between the water body and construction site. Place silt fence across the top and toe of the slope to protect the water body, as necessary. Place spoils in an area where they cannot erode back into the water body.

Construction Sequence

The following construction sequence will be followed:

- Install silt fence at the limit of the disturbed area, as appropriate, prior to any grading operation.

- Install temporary inlet filters at all adjacent and down-gradient storm water inlets, catch basins and manholes that may be impacted.
- Install all temporary and permanent erosion and sediment control measures in accordance with the approved plan.
- Install an anti-tracking pad at the site access points. The pad should be underlain with fabric and provide the specified depth of aggregate, per approved plans.
- Rough grade the site and stockpile topsoil. Place stockpiles and other spoil piles away from the drainage system to minimize sediment transport. If the stockpile / spoil pile must remain on-site overnight, or if the weather conditions indicate the chance for precipitation, a) cover the pile with water repellent material to prevent erosion and/or b) install silt fencing around the base of the pile to prevent transport of sediment to the storm water system, or apply other control methods appropriate to the site. Control measures to guard against wind erosion must also be employed, such as wetting or covering the stockpiles. Keep as few stockpiles as possible during the course of the project.
- Perform site restoration and stabilization at the end of each workday so that no temporary or permanent erosion and sedimentation control measures are removed, displaced, or rendered ineffective.
- Maintain all temporary and permanent control measures per the plan or as needed based on the site inspections.
- Maintain a file of completed field inspection reports at the site. A copy of the field inspection report is on file with OSEH.
- Provide for a sweeper to remove sediment tracked onto the pavement daily, at a minimum. Sweepers must be used more frequently, based on site conditions, to ensure track out onto roadways is minimized.
- Remove debris from the catch basin grates on an as needed basis.
- Finish grade, redistribute topsoil, and seed or mulch all disturbed areas. Maintain silt fences and storm inlet filters.
- Complete permanent soil erosion control measures for all slopes, channels, ditches, or any disturbed land area within 5 calendar days after final grading or the final earth change has been completed.
- Remove any accumulated sediment and remove all temporary erosion and sediment control measures, once vegetation has been established.

- Notify the Project Manager and OSEH for a final inspection when the project is completed.

Best Management Practices

SESC measures/BMPs are used for projects involving earth disturbance to prevent soil erosion and sediment from leaving the property. The Michigan Department of Environmental Quality's (MDEQ) *Guidebook of Best Management Practices for Michigan Watersheds*, identifies the following non-structural and structural BMPs to control erosion and sediment while undertaking earth disturbance activities.

Housekeeping

- Street Sweeping
- Community Car Wash
- Household Hazardous Waste Disposal

Managerial

- Critical Area Stabilization
- Dune/Sand Stabilization
- Dust Control
- Equipment/Maintenance Storage Areas
- Fertilizer Management
- Lawn Maintenance
- Organic Debris Disposal
- Pesticide Management
- Pond Construction & Management
- Pond Sealing & Lining
- Slope/Shoreline Stabilization
- Stream bank Stabilization
- Winter Road Management

Construction Site Preparation

- Access Road
- Construction Barriers
- Grading Practices
- Land Clearing
- Spoil Piles
- Staging & Scheduling
- Tree Protection

Runoff Conveyance & Outlets

- Check Dams
- Diversions
- Grade Stabilization Structures
- Grassed Waterways
- Riprap
- Stabilized Outlets
- Storm Water Conveyance Channels

- Subsurface Drain

Sedimentation Control Structures

- Buffer/Filter Strips
- Dewatering
- Filters / Filter Fencing
- Sediment Basins
- Watercourse Crossing

Runoff Storage

- Catch Basins
- Extended Detention Basin
- Infiltration Basin
- Infiltration Trench
- Modular Pavement
- Oil/Grit Separators
- Parking Lot Storage
- Porous Asphalt Pavement
- Roof Top Storage
- Wet Detention Basin

Vegetative Establishment

- Mulching
- Seeding
- Sodding
- Soil Management
- Trees, Shrubs and Ground Cover

Wetland

- Constructed Wetland Use in Storm Water Control
- Wetland Crossings

These SESC measures/BMPs shall be used, as appropriate, based on the specific needs of a construction site. Note: Not all sites will need to use all of these practices. Alternate SESC measures/BMPs are acceptable for use, provided detail of the specific SESC measure/BMP is submitted on construction drawings or associated documents. Examples of alternate SESC measures/BMPs include those used by the Michigan Department of Management & Budget (DMB) and the Michigan Department of Transportation (MDOT).

Responsibilities of U-M Departments

All U-M staff contribute to the effectiveness of the soil erosion and sedimentation control procedures on University property. The following are minimum responsibilities of U-M departments:

General Responsibilities for All U-M Departments

- Notify OSEH of all projects involving earth disturbance that a) are within 500 feet of “Waters of the State” as defined in the Glossary or b) earth disturbances not stabilized within 24 hours of the initial earth disturbance.
- Comply with the U-M Soil Erosion and Sedimentation Control procedures and Part 91 for projects that disturb the soil.
- Determine appropriate soil erosion and sediment control measures for maintenance projects that involve excavating, grading, or other work that disturbs the soil.
- Incorporate SESC measures/BMPs, as appropriate for activities that involve earth disturbance.
- OSEH staff or their designee who have received MDEQ SESC training, will perform weekly and post-storm inspections of project sites where earth disturbances exist for 1 week or greater. All site inspection reports must be maintained at the site. A copy of the field inspection report will also be on file with OSEH.

Plant Operations, Auxiliary Units (UMA2) & Facilities Management (UMD, UMF)

- Comply with the U-M Soil Erosion and Sedimentation Control procedures and Part 91 for projects that disturb the soil.
- Notify OSEH of all projects involving earth disturbance, a minimum of 45 days in advance, that a) will last longer than 24 hours OR b) are within 500 feet of a “Waters of the State” as defined in the Glossary.
- Provide support to the units with responsibilities for soil erosion and sedimentation control measures and the Storm Water Management Program.

- Supervisors of maintenance projects will evaluate for and implement appropriate sedimentation control measures during field activity.
- G&WM will assist in soil erosion control practices through maintenance of vegetation and best management practices during soil disturbance activities.

Plant Extension

- Comply with the U-M Soil Erosion and Sedimentation Control procedures and Part 91 for projects that disturb the soil.
- Notify OSEH of all projects involving earth disturbance, a minimum of 45 days in advance, that a) will last longer than 24 hours OR b) are within 500 feet of “Waters of the State” as defined in the Glossary.
- Create and update the Standard Design and U-M Design Guidelines, as needed, to incorporate soil erosion and sedimentation control measures, specifications and requirements.
- Provide a short summary of projects with Erosion and Sedimentation Control Plans to OSEH in July for activities in the previous year. The summary is a list of projects and any significant concerns or issues that occurred with soil erosion control efforts. This information will be included in the University’s Municipal Storm Water permit annual report, as appropriate.
- Implement other control measures deemed necessary to meet MDEQ regulations, as needed.
- Plant Extension – University Planner’s Office personnel who have received MDEQ SESC training, will review design specifications and plans submitted for compliance with the required elements of soil erosion and sedimentation control.

OSEH (Campus Safety – UMD; Environment, Health & Safety – UMF)

- U-M Ann Arbor OSEH acts as the primary point of contact regarding the U-M Soil Erosion and Sedimentation Control procedures. U-M Dearborn and U-M Flint each have a designated and trained representative working with their respective departments to manage the approved U-M SESC procedures on their campuses, however, OSEH representatives from U-M Ann Arbor have final authority over the implementation of the SESC procedures on Dearborn and Flint campuses. OSEH representatives from U-M Ann Arbor manage the approved U-M SESC procedures on the Ann Arbor campus and on all other properties within the State.

- Work with Plant Extension to secure storm water permits from MDEQ for projects that involve earth disturbance of 5 acres or more, and all other necessary environmental permits.
- Review and approve SESC plans submitted for compliance with the required elements of soil erosion and sedimentation control.
- OSEH or their SESC trained designee perform weekly and post-storm inspections, using the Field Inspection Report, for construction sites where a) earth disturbances exist for 1 week or greater, b) earth disturbances of one acre or greater in size or b) earth disturbances within 500 feet of “Waters of the State” as defined in the Glossary. All field inspection reports must be maintained at the site. A copy of the field inspection report will also be on file with OSEH.
- Perform periodic reviews of site inspection, control and corrective action records.
- Create and update the SESC procedures for the University, as needed, and create inspection forms for use by U-M staff during site inspections.
- Coordinate and maintain MDEQ SESC training of all individuals responsible for making SESC procedure/program decisions.
- Coordinate training records for MDEQ SESC training received by U-M staff, applicable to these procedures.
- Prepare reports to regulatory agencies, as needed.

Inspections

Inspections of work sites are essential to controlling erosion and sedimentation concerns. Personnel from several departments have received SESC training from the MDEQ. This provides a strong base of personnel to draw upon to regularly review maintenance, renovation, and construction sites. The inspections focus on requirements of site-specific erosion and sedimentation control plans for the project. Conditions can change at maintenance, renovation, and construction sites and the inspectors should make adjustments to the erosion and sedimentation control measures, as needed.

OSEH or their designee, who have received a MDEQ SESC certificate of training, will inspect sites weekly during maintenance, renovation, and construction activities and following significant rain events to ensure compliance with the U-M SESC procedures and Part 91. Sites 1 acre and above will be inspected within 24 hours of the rain event to comply with National Pollution Discharge Elimination System (NPDES) inspection requirements.

Issues and concerns will be referred to the project/construction manager or designee for correction. The contractor will make any necessary repairs or corrections to the control measures within 24 hours, if waters of the state are being impacted. Other corrections, not impacting waters of the state will be made within 5 days. The project/construction manager will report any issues that cannot be corrected within 5 days to OSEH. Additional detail as to why the correction cannot be made in that time frame will be required.

Inspection results will be recorded on the Field Inspection Report (Appendix C). Any erosion and sedimentation problems will be reported to the project/construction manager for correction and copied to the department manager. All site inspections for maintenance, renovation, and construction projects will be maintained at the site and a copy will be filed at OSEH for record keeping.

Notifications to Outside Agencies

As an APA, the U-M has the authority to implement its own soil erosion and sedimentation control procedures with regard to earth changes undertaken on its property. OSEH will make all necessary notifications of proposed earth changes to the appropriate Municipal Enforcing Agency or County Enforcing Agency.

In the event construction activities result in soil erosion and sedimentation that deposits or threatens to deposit sediments into the drainage system, OSEH will be notified. OSEH will investigate the incident and will direct the necessary corrective actions to prevent further deposits of sediment into the drainage system. In addition, OSEH will make any necessary notifications to the MDEQ District Supervisor in accordance with applicable NPDES permit conditions.

Notifications within U-M

Public comments, complaints or other information regarding construction activities or construction site storm water runoff leading into the storm water drainage system are received by the U-M Department of Public Safety and OSEH as part of U-M's Storm Water Management Plan. All calls are subsequently investigated and addressed by OSEH.

Penalties for Non-Compliance

Penalties for non-compliance with the approved U-M SESC procedures or Part 91 include:

- A stop work order may be issued until compliance is obtained.
- The Owner (U-M) may withhold payment to the contractor if contract obligations are not met.
- The Owner can install or maintain control measures to bring a non-conforming construction project site into compliance with Part 91 of Act 451 and back charge the contractor for the costs incurred.
- The Owner can be assessed fines up to \$25,000 per day, per violation pursuant to section 324.9121.
- University personnel are provided sufficient resources to be able to respond to SESC non-compliances. Employees are required to comply with SESC procedures. Implementation of the SESC procedures, like any other job duty, is a factor in employee performance evaluations and merit increases and/or disciplinary action as appropriate.

Technical Support

The following U-M departments are available to provide technical support:

U-M Dearborn

Campus Safety / OSEH	Phone: (313) 593-4914
Campus Safety	Phone: (313) 593-5333
Facilities Management	Phone: (313) 593-5270

U-M Flint

Environment, Health & Safety	Phone: (810) 766-6763
Facilities Management	Phone: (810) 762-3223

All other U-M properties within the state

Plant Extension – University Planner’s Office	Phone: (734) 936-3184
OSEH – Environmental Management	Phone: (734) 936-1920
(Storm water permits, U-M’s SESC procedures, regulatory agency contact)	

Reference Material*

Guidebook of Best Management Practices for Michigan Watersheds
Available from the Michigan Department of Environmental Quality, Surface Water Quality Division.

www.michigan.gov/deq/

Standards & Specifications for Soil Erosion & Sediment Control
Available from the Washtenaw County Conservation District. This document may be reviewed at the U-M, Office of Facilities Planning and Design, Plant Extension – University Planner's Office

www.washtenawcd.org

Construction Site Storm Water Certified Operator Training Manual
Available from the Michigan Department of Environmental Quality, Surface Water Quality Division.

www.michigan.gov/deq/0,1607,7-135-3313_3682_3716---,00.html

Michigan Act 451, Public Acts 1994, as amended, Part 31 – Water Resources Protection & Part 91 – Soil Erosion and Sedimentation Control

www.michigan.gov/orr

Michigan Act 451, Public Acts 1994, as amended, NPDES Permit No. MI0053902, issued to The U-M by the Michigan Department of Environmental Quality

www.michigan.gov/orr

Michigan Drain Code (1956 PA 40, as amended)

** Materials referenced may be updated at any time. Check the websites for the most current information.*

Glossary

DAM – an artificial barrier, including dikes, embankments, and appurtenant works, that impounds, diverts or is designed to impound or divert water or a combination of water or any other liquid or material in the water. (Part 315)

EROSION – the process by which soil particles are dislodged by wind, water, or gravity.

LAKE – the Great Lakes and all natural and artificial inland lakes or impoundments that have definite banks, a bed, visible evidence of a continued occurrence of water, and a water surface area equal to, or greater than, one acre. (Part 91)

NPDES Storm Water Permits – National Pollution Discharge Elimination System storm water construction permits are required for projects which disturb 1 or more acres. Sites between 1 and 5 acres are covered by permit by rule. Sites 5 acres or greater require a notice of coverage. This permit regulates the discharge of storm water from construction sites. The University of Michigan also has a NPDES municipal storm water permit that regulates the discharge of storm water from campus. (Part 31)

POND - all natural and artificial inland lakes or impoundments that have definite banks, a bed, visible evidence of a continued occurrence of water, and a water surface area equal less than one acre.

SEDIMENTATION - soil particles deposited on land or in water bodies.

STREAM – a river, creek, or other surface water course which may or may not be serving as a drain, as defined in the drain code, and which has definite banks, a bed, and visible evidence of the continued flow or continued occurrence of water, including the connecting waters of the Great Lakes. (Part 91)

WETLAND – land characterized by the presence of water at a frequency and duration sufficient to support, and that under normal circumstances does support, wetland vegetation or aquatic life, and is commonly referred to as a bog, swamp, or marsh. (Part 303)

WATERS OF THE STATE – . . . includes the Great Lakes and their connecting waters, lakes, ponds, and streams which may or may not be serving as a county drain as defined by the drain code; or any other body of water that has definite banks, a bed, and visible evidence of a continued flow or continued occurrence of water and wetlands regulated under part 303. NOTE: The definition above has been paraphrased, reference Part 91, Part 31 and Part 303 for the applicable regulatory definitions.

Appendices

Appendix A – Project Notification Form

(Fax the completed form to OSEH a minimum of 45 days in advance of the proposed construction start date.)

UNIVERSITY OF MICHIGAN
SOIL EROSION SEDIMENTATION CONTROL PROCEDURES

Project Notification Form - Soil Erosion & Sedimentation Control

Project Name:	Design Supervisor:
Project Number*:	Design Supervisor Phone:
Project Start Date:	Construction Supervisor:
Project Completion Date:	Construction Supervisor Phone:

1 acre = 43,560 sq. ft.

Name of Nearest Water of the State:
NOTE: "Water of the State" includes the <u>Great Lakes and their connecting waters, lakes, ponds,</u> and <u>streams</u> which may or may not be serving as a <u>county drain</u> as defined by the drain code; <u>or any other body of water that has definite banks, a bed, and visible evidence of a continued flow or continued occurrence of water</u> and <u>wetlands</u> regulated under part 303.

Proximity to Nearest Water of the State (feet):

Total Acreage of the Project Site (to the nearest 0.01 acre):

Total Disturbed Acreage of Project (to the nearest 0.01 acre):

FAX completed form to:

Ann Arbor - OSEH-EP³ (734) 763-1185
Dearborn - Campus Safety/OSEH (313) 436-9161
Flint - Environment, Health & Safety (810) 424-5572

* ☐ Please check box if project is NON-GENERAL fund and provide short code.
Non-general fund projects will be billed at a rate of \$63.14/hour.

Shortcode:

Appendix B – Design & Review Checklist for SESC Plans

DESIGN & REVIEW REQUIREMENTS

Project Name: _____ Address: _____ Contact Person: _____

Project Number: _____ City: _____ Phone: _____

- **Is this project within 500 feet of water of the state?** _____ **Yes** _____ **No**
If yes, a soil erosion and sedimentation control plan is required. Refer to the U-M Soil Erosion & Sedimentation Control Program for details.
- **Calculate the total area of this site =** _____ **acres**
- **Calculate the total area of earth disturbance for this project =** _____ **acres**
If the earth change disturbs **1 or more acres**, a SESC plan is required. If the earth change disturbs **5 or more acres**, a storm water permit is required in addition to a SESC plan. You must contact U-M OSEH to apply for a storm water permit for this site. All contact to regulatory agencies must be managed through the OSEH office.

The Soil Erosion & Sedimentation Control Plan must contain the following elements:

Identify the sheet, drawing, or attachment where each required element is located in the SESC Plan for the project.

Design Development Requirements

- | | |
|--|--|
| <p>1 _____</p> <p>2 _____</p> <p>3 _____</p> <p>4 _____</p> <p>5 _____</p> <p>6 _____</p> <p>7 _____</p> <p>8 _____</p> <p>9 _____</p> <p>10 _____</p> <p>11 _____</p> <p>12 _____</p> | <ul style="list-style-type: none"> ■ Scaled Map including: <ol style="list-style-type: none"> 1. Legal description 2. Site location sketch 3. Proximity to water of the state 4. Predominant land features 5. Contour intervals or slope descriptions 6. Soil survey / written description of soil types of the exposed land area ■ Details for the proposed earth change including: <ol style="list-style-type: none"> 7. Description and location of the physical limit of each proposed earth change 8. Description and location of all existing and proposed on-site drainage and dewatering facilities 9. Timing and sequence of each proposed earth change 10. Location and description for installing and removing all temporary SESC measures ■ Construction Development Requirements <ol style="list-style-type: none"> 11. Description and location of all permanent SESC measures 12. Program for the continued maintenance of all permanent SESC measures that remain after project completion. Include the designation of the person responsible for the maintenance. |
|--|--|

Appendix C – Field Inspection Report

University of Michigan • Soil Erosion & Sedimentation Control • FIELD INSPECTION REPORT

Project Name: _____

Location: _____

City/Township: _____

Inspection

Type: ☐ Weekly ☐ After Storm

Weather

Conditions: _____

Date of

Inspection: ____ / ____ / ____

Are approved plans available on site? ☐ Yes ☐ No ☐ N/A (site <1 acre >500 ft waters of the State)

Is earth change confined to areas specified on the plans? ☐ Yes ☐ No ☐ N/A (site <1 acre >500 ft waters of the State)

Are controls installed per plans? ☐ Yes ☐ No ☐ N/A (site <1 acre >500 ft waters of the State)

Is sediment properly contained on the site? ☐ Yes ☐ No

Are storm sewers being protected? ☐ Yes ☐ No

Are controls adequate for site? ☐ Yes ☐ No

Control Measures	Properly Maintained?	Comments:
Anti-tracking Pad	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Inlet Filters / Bags	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Silt Fence	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Sweeper	<input type="checkbox"/> Yes <input type="checkbox"/> No	
	<input type="checkbox"/> Yes <input type="checkbox"/> No	
	<input type="checkbox"/> Yes <input type="checkbox"/> No	

Additional Comments: _____

Corrections (if any) must be made within: ☐ 24 hours ☐ 5 days ☐ Immediate Response Required

Report was ☐ Left on Site ☐ Mailed To: _____

Copies Sent To: _____

Persons attending inspection: _____

Notice of Deficiency Recommended: ☐ Yes ☐ No

☐ Documentation (photos, samples, measurements, etc.)

Inspector's Signature: _____

Date: ____ / ____ / ____

MDEQ Certified Operator # C - _____ I - _____ SESC# ____ - _____

NOC #: _____

*** OSEH use only *** Reviewed by: _____

Date: _____

Inspection Frequency:

The entire site must be inspected to ensure that if erosion or sedimentation is occurring anywhere on the site they are identified, documented, and appropriately addressed.

1. State of Michigan Certified Storm Water Operator:
 - Inspections must be performed within 24 hours after a rain event that produces runoff from sites with 1 acre or more disturbed area.
2. MDEQ SESC Trained Inspector:
 - Inspections must be performed **once per calendar week** on all sites where areas are disturbed;
 - **AND after significant rain events.**
 - A final inspection of the stabilized site will be performed by a SESC trained Inspector once permanent control structures have been installed, maintenance for permanent controls has been arranged, vegetation has been established and temporary controls have been removed.

Completing the Field Inspection Report

Project / General Information

- Identify the project Name and Location
- Check the Type of Inspection being performed – Weekly or After Storm
- Detail the Weather Conditions during the inspection.
- Provide the Date the Inspection occurred.
- If the site is covered under an NPDES Notice of Coverage, write the NOC # at the bottom of the form.

Site Inspection

- Confirm approved Soil Erosion & Sedimentation Control (SESC) plans are available on site.
- Review the site conditions and complete the questionnaire.
- Detail the control measures on site, even if they are working properly.
- Identify any issues on the site. Include anything done to repair or improve the SESC measures (regular maintenance, new installations, repairs, etc.)
- If controls are not Properly Maintained, provide detail on the issue(s) in the appropriate Comments section.

Additional Comments

- Identify any suggestions for improvements or corrections to soil erosion or sedimentation control issues.

Corrections

- If waters of the State are being impacted, corrections must be made within 24 hours.
- Issues not impacting Waters of the State must be made within 5 days.
- Mark Immediate Response Required if unacceptable conditions continue.

Notice of deficiency recommended

- If SESC control measures remain deficient on site, after a written notice has been provided to the project/construction manager to correct the issue(s) within 5 days, a Notice of Deficiency may be issued. If the deficiency is not corrected by the contractor within the specified time frame, U-M may take any action necessary to remedy the deficiency and bill the contractor (time & materials, etc.) for those actions.

Inspection Report - Distribution

- Document delivery of the completed report to the appropriate project/construction manager.
- The original (or a copy) of the inspection report must be kept on site.
- A copy of the inspection report record will be retained in the OSEH Office.
UM-Ann Arbor OSEH-EP³ 734-936-1920 • FX: 734-763-1185 • 1239 Kipke Drive, 48109-1010 UM-Dearborn Campus Safety/OSEH (313) 593-4914 • UM-Flint EHS (810)766-6763

NOTE: Permanent soil erosion control measures for all disturbed areas are required to be completed within 5 calendar days after: 1) final grading or 2) the final earth change has been completed.

Appendix D – Preferred SESC Design Elements

Appendix E – Regulations in Brief

MDEQ's Guidebook of Best Management Practices for Michigan Watersheds
(selections)

APPLICABLE STATE AND FEDERAL REGULATIONS

The following section briefly describes the federal, state, and local laws currently in effect, which have some impact on the management of nonpoint source pollution. The purpose of this section is not to give a detailed analysis of each law, but to provide a brief description of the laws that affect land and water construction activities in Michigan. Figure 10 at the end of this section graphically illustrates these laws.

Federal Clean Water Act.

Section 405 of the Water Quality Act of 1987 amended Section 402 of the Clean Water Act of 1972 by requiring EPA to develop regulations requiring permit applications for storm water discharges associated with industrial activity, and storm sewers from municipalities with populations of 100,000 people or more (medium and large size municipalities). The requirements would eventually include small municipalities, those with populations of less than 100,000 people. These regulations were published on November 16, 1990.

There are a large number of industries that will be required to apply for permits under the regulation. One notable industry is the construction industry, for activities that will disturb more than five acres of land. A notable exemption to the Act is agriculture.

As a result of the amendments to the Water Quality Act, there will be an increased effort to eliminate non-storm water discharges into storm sewers. Requiring permits for discharges of storm water runoff from municipalities and industries is an attempt to reduce the discharge of pollutants through management, controls, education and engineering methods. Permits must require medium and large size municipalities to control pollutants in their storm water runoff to the Maximum Extent Practicable (MEP).

Part 31, Water Resources Protection of the Natural Resources and Environmental Protection Act, 1994 P.A. 451 (formerly Water Resources Act, Act 245).

Part 31 of Act 451 empowers the Director of the DEQ to protect and conserve the water resources of the state. This includes the prohibition of pollution of the state's waters, and to prohibit the obstruction and occupation of floodways, and prohibit activity that would harmfully interfere with the stage discharge characteristics of the rivers and streams of the state.

Part 91, Soil Erosion and Sedimentation Control, of the Natural Resources and Environmental Protection Act, 1994 P.A. 451 (formerly Soil Erosion and Sedimentation Control Act, Act 347).

Part 91 of Act 451 provides for the control of soil erosion, and protects the waters of the state from sedimentation. Part 91 is applicable to all earth changes of one acre or greater to any earth change within 500 feet of a lake or stream.

Part 91 is enforced at three different levels of government: local (city, village, or charter township), county, or state. Counties are given the primary responsibility for administration of Part 91. In some instances, public agencies, such as road commissions and drain commissions are self-enforcing.

The methods for minimizing erosion have a significant impact on the amount of runoff as well as controlling sediments. Since sedimentation is estimated to be a pollutant in about 95% of the watersheds in Michigan, Part 91 is very important in controlling a high percentage of the nonpoint source pollution problems.

Part 301, Inland Lakes and Streams, of the Natural Resources Environmental Protection Act, 1994 P.A. 451 (formerly Inland Lakes and Streams Act, Act 346).

Part 301, as amended was enacted to regulate activities occurring within inland lakes and streams; and to protect riparian rights and the public trust in inland lakes and streams.

One of the environmental concerns that are addressed by Part 301 includes regulating dredge or fill projects (within the banks of a watercourse). In one way, the Inland Lakes and Streams Act could be thought of as a "bottomland" version of the Soil Erosion and Sedimentation Act. Whenever bottomlands are dredged or filled, a permit must be obtained, and adequate soil erosion control measures are a condition of the permit. As noted above, the control of erosion and sedimentation are essential to begin to solve nonpoint source pollution.

Part 303, Wetland Protection, of the Natural Resources Environmental Protection Act, 1994 P.A. 451 (formerly Goemaere-Anderson Wetland Protection Act, Act 203).

Part 303 provides for the preservation, management, protection, and use of wetlands. A permit is required for the alteration or use of a wetland. This Part applies to wetlands that are contiguous (a ground or surface water connection) to a lake, pond, river, or stream; to many isolated wetlands that are greater than five acres in size; in counties having a population in excess of 100,000 or to any wetland determined to be essential to the preservation of the natural resources of the state from pollution, impairment, or destruction.

Part 303, in part, indicates that some or all of the following benefits are derived from a wetland:

1. Flood and storm control by the hydrologic absorption and storage capacity.
2. Pollution treatment by serving as a biological and chemical oxidation basin.
3. Erosion control by serving as a sedimentation area and filtering basin, absorbing silt and organic matter.

It is imperative that wetlands not be exploited as the solution to all storm water treatment problems. Wetlands must be recognized and protected against excessive point and nonpoint storm water pollution loads just as any other surface water (lake or stream) would be protected. This can be accomplished by maintaining the pre-development hydrologic characteristics of the wetland. If use of a wetland area is considered as part of a storm water management project, the District Office of the Land and Water Management Division, Michigan Department of Environmental Quality, should be contacted for advice and guidance on permit requirements.

Part 17, Michigan Environmental Protection Act, of the Natural Resources and Environmental Protection Act, 1994 P.A. 451 (formerly Michigan Environmental Protection Act (MEPA), Act 127).

The Michigan Environmental Protection Act is an extremely important piece of legislation, as it provides protection of the air, water, and other natural resources, and the public trust associated with these resources. The Act provides the right to any person in the State to bring action against another person, agency, corporation, or political subdivision for conduct that may pollute, impair, or destroy the air, water, or natural resources.

Part 31, Water Resources Protection, of the Natural Resources Environmental Protection Act, 1994 P.A. 451 (formerly Flood Plain Control Act (1929 P.A. 245 as amended by Act 167 of P.A. 1968)).

The purpose of this Act is to control encroachments in floodways for flows including a one percent probability. This would be a requirement for all occupations or alterations including bridges and culvert construction, fills, and stream modifications.

Part 315, Dam Safety, of the Natural Resources Protection Act, 1994 P.A. 451 (formerly Michigan Dam Safety Act, Act 300, P.A. of 1989).

This Part requires a Dam construction permit for the construction of a structure that will be six feet more in height and will impound five surface acres or more at the design flood elevation. Depending on size, some detention ponds may fall under the authority of this Part.

This Part (or Part 315) requires dams to have a specified spillway capacity, based on the hazard rating of the dam. As an example, low hazard potential dams must have a spillway capacity that is capable of passing the 100-year flood, or the flood of record whichever is greater. (Low hazard potential dams are located in areas where failure would pose little to no danger to individuals, and damage would be limited to agriculture, uninhabited buildings, structures, or township or county roads). Other dam classifications with a height of less than 40 feet of height would require a spillway that is capable of passing the 200-year flood, or the flood of record whichever is greater.

Subdivision Control Act, Act 288, P.A. of 1967.

This Act was passed to regulate the subdivision of land; and to promote the public health, safety, and general welfare. Among the provisions of the Act (Section 192) is the review of the county drain commissioner, or the governing municipality for adequate storm water facilities within the proposed subdivision. At this time, there is no statewide standard that is being used in regard to quality and quantity issues. As a result, a standard—if one exists—will vary between communities and counties.

Part 305, Natural Rivers, of the Natural Resources Environmental Protection Act, 1994 P.A. 451 (formerly Natural River Act, Act 231, P.A. of 1970).

The purpose is to establish a system of outstanding rivers in Michigan, and to preserve, protect, and enhance the wildlife, fisheries, scenic, historical, recreational, and other values associated with those river environments. A list of designated rivers is included in the Appendices.

Most activities within an established Natural River District (usually all land within 400 feet of the river's edge of both sides of the river) require state or local zoning permits. These include:

1. Building construction
2. Platting of lots
3. Cutting of vegetation within an established natural vegetation strip
4. Land alteration
5. Bridge construction

Michigan Drain Code (1956 PA 40, as amended)

LAND/WATER RELATED LAWS IN MICHIGAN NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION ACT ACT 461 OF THE PUBLIC ACTS OF 1994 & RELATED STATUTES

