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Antrim County
Soil Erosion Sedimentation and Storm Water Runoff Control Ordinance
Guidelines

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Soil Erosion, Sedimentation and Stormwater Runoff Control Ordinance Guidelines

PREAMBLE

These guidelines are to be used in conjunction with the Antrim County Soil Erosion, Sedimentation and Storm Water Runoff Control Ordinance.

A. Definitions

SEE ORDINANCE

B. Part 91 and the rules adopted there under.

These Guidelines are in addition to the Ordinance, Part 91 and rules adopted thereunder. In the event of conflict between these guidelines and Part 91 and rules adopted thereunder these Guideline shall control.

C. Soil Erosion, Sedimentation and Stormwater Runoff Control Facilities and Measures – Temporary and Permanent

Earth changes shall be carried out in accordance with a Soil Erosion Sedimentation and Stormwater Runoff Control Plan approved by the Soil Erosion Control Officer. The following measures shall be considered in preparing the Soil Erosion Sedimentation and Stormwater Runoff Control Plan.

1. All earth changes shall be designed, constructed, and maintained in such a manner as to minimize the extent and duration of earth disruption.

2. Soil erosion control facilities shall be designed to remove sediment from stormwater before the stormwater leaves the site of the earth change activity.

3. Vegetative stabilization or other control measures shall be installed and maintained throughout the development process.

4. Critical areas exposed during construction shall be protected with methods of stabilization approved by the Soil Erosion Control Officer.

5. Removal of natural surface vegetation and tree roots within fifty (50) feet of the ordinary high water mark of any lake or stream shall be discouraged, if necessary, for soil erosion, sedimentation and stormwater control purposes.

6. Removal of natural surface vegetation and tree roots within twenty-five (25) feet of the edge of any protected wetland shall be discouraged, if necessary, for soil erosion purposes near a regulated wetland.

7. Soil Erosion, Sedimentation and Stormwater Runoff Control Facilities and Measures shall be installed before grading, filling, or removal of vegetative cover is initiated.

8. Soil Erosion, Sedimentation and Stormwater Runoff Control Facilities and Measures shall be installed as needed for all earth changes. These controls shall be sized to settle and contain sediment expected in runoff during the operating life of the control measure.

9. Sediment basins shall include overflow spillways or other design features to control the runoff from a 100-year, 24-hour storm event.

10. All public utilities shall be installed in such a fashion that soil erosion sedimentation and stormwater runoff is minimized.

11. Where possible, soil erosion control measures installed at the perimeter of a development site shall be installed to allow for on-site maintenance.

12. If lakes, ponds, streams, or regulated wetlands are located on or near the site, both temporary and permanent Soil Erosion, Sedimentation and Stormwater Runoff Control Facilities and Measures shall be provided which intercept runoff and trap sediment before runoff reaches any such water body or wetlands.

13. Exposed slopes within fifty (50) feet of lakes, streams, regulated wetlands, stormwater ponds, or adjoining properties that have slopes steeper than 3:1 (three foot horizontal to one foot vertical) shall be stabilized by methods approved by the Soil Erosion Control Officer.

14. When it is not possible to permanently stabilize a disturbed area after an earth change has been completed or when significant earth change activity ceases, temporary soil erosion sedimentation and stormwater control measures shall be installed and maintained.

15. Permanent soil erosion sedimentation and stormwater control measures for all slopes channels, ditches, or any disturbed land area shall be completed within five (5) calendar days after final grading or the final earth change has been completed. All temporary Soil Erosion, Sedimentation and Stormwater Runoff Control Facilities and Measures shall be maintained until permanent soil erosion control measures are established.

16. Soil Erosion, Sedimentation and Stormwater Runoff Control Facilities and Measures shall be maintained throughout the duration of the initial earth change and the balance of the operating life of each measure.

D. Temporary and Permanent Stormwater Runoff Control Facilities

Stormwater runoff control measures shall be implemented in accordance with a Soil Erosion, Sedimentation and Stormwater Runoff Control Plan approved by the Soil Erosion Control Officer.

1. On-site storm water runoff control facilities shall be required for all sites unless a proposal for off-site stormwater runoff control has been accepted by the Soil Erosion Control Officer. Unless otherwise specified in these Guidelines or by the Soil Erosion Control Officer, storm water runoff control facilities shall be designed using parameters from the *Stormwater Management Guidebook* (rev. August 1999 as amended), published

by the Michigan Department of Environmental Quality (MDEQ) --- See Section E for details.

2. Stormwater control facilities for a developed site shall be planned and designed to reproduce the pre-development hydrology of the site (runoff volume, runoff patterns, peak flows, and/or runoff velocities) to the maximum possible extent.

3. Infiltration trenches, perforated pipe, and infiltration basins shall be encouraged provided that:
    a. Sediment is removed from stormwater runoff before runoff reaches the infiltration facility,
    b. Design incorporates maximum permissible drainage times (see paragraph 4 below), and
    c. Adequate provisions, in writing, for facility maintenance have been made.

4. Overland flow to infiltration and detention devices shall, to the extent possible, pass through a dense vegetative cover. Infiltration basins shall be lined with a vegetative cover designed to slow the flow of runoff and to trap pollutants. Sediment traps or sediment basins shall be provided for the purpose of collecting sediment before stormwater reaches the infiltration basin or trench. Infiltration facilities shall be designed to distribute stormwater runoff volume evenly over the floor of the basin. Infiltration facilities shall be sized so that the design inflow volume will be infiltrated completely within 72 hours.

5. Dry wells shall be discouraged as a stormwater control method. If the use of stormwater infiltration or detention basins, either on-site or off-site, is not feasible, the installation of drainage wells may be allowed. All dry wells must provide the following:
    a. Catch basins, sediment basins, silt traps, or vegetative filter strips to remove sediment from stormwater flowing to the dry well;
    b. An approved overflow system which will not discharge to watercourses, lakes, streams, ditches, drainage swales, or wetlands on or near the site, and
    c. Adequate provisions for maintenance of the dry well shall be made such that the dry well will function satisfactorily throughout its design life.

6. Detention basins shall be designed as extended detention basins to detain runoff on the site for twenty-four (24) hours or more to allow for maximum settling and removal of suspended solids and other pollutants. Vegetation shall be installed and maintained in the basin to help absorb pollutants. Maintenance of the basin shall include sediment removal and vegetation control; such that the required detention volume shall not decrease over the design life of the basin. Under no circumstance shall stormwater be permitted to remain in the basin for more than 72 hours.

7. At a minimum, detention, retention, and infiltration basins shall have the storage capacity to hold the increase in runoff volume generated by the earth change. The required volume shall be calculated by comparing the undeveloped condition to the developed condition for a twenty-five (25) year, twenty-four (24) hour storm frequency event. The Natural Resources Conservation Service (NRCS) method, as modified by the Michigan Department of Environmental Quality (DEQ), shall be used to determine runoff volumes. Use of other methods shall require the prior approval of the Soil Erosion Control Officer.

Runoff volume calculations using the NRCS method shall incorporate undeveloped site soil hydrologic group(s) obtained from the *Soil Survey of Antrim County, Michigan, USDA, (December 1978)* in the determination of the appropriate composite runoff curve number. Runoff volumes representing developed conditions shall account for appropriate post-development soil conditions, including degree of compaction and altered initial abstraction rates, final slopes, imported fill, final cover, etc., in deriving the appropriate post-development composite curve number. See Section E for access to information found in the *Soil Survey*.

8. The peak discharge from the developed site shall not exceed that of the peak discharge from the site in its undeveloped condition. Use of infiltration, detention, and other storage basins is encouraged to effect the reduction in peak flow rates from the developed site. Peak discharge computations shall follow the NRCS method using unit hydrographs as modified by the Michigan DEQ (See Section E). Under certain conditions, especially for discharge computations in fully impervious areas, the Rational Method may be used at the discretion of the Soil Erosion Control Officer.

9. Stormwater runoff control basins designed for detention or infiltration shall be isolated from septic systems and water wells by fifty (50) feet or more.

10. A two-stage design for detention and infiltration basins shall be used on sites where parking lots and other impervious surfaces exceed five (5) acres in size, as well as for other sites identified by the Soil Erosion Control Officer or the Michigan Department of Environmental Quality as requiring special protection for water quality purposes

11. Whenever possible, a created wetland or other types of biofiltration area may be incorporated into permanent stormwater control facilities to help remove soluble pollutants that cannot be removed by conventional settling. Sediment carried by runoff shall be allowed to settle, using soil erosion control basins described above, before runoff flows into the created wetland or other biofiltration area. Maintenance procedures for such wetland and biofiltration areas shall be incorporated in the stormwater and sediment control plan.

12. Infiltration and detention basins shall have an emergency overflow system. The overflow system shall be designed to safely convey runoff from the 24-hour, one hundred (100) year storm event, or as otherwise required by the Soil Erosion Control Officer.

13. Side slopes of any stormwater infiltration or detention basin shall be no greater than 3:1 (horizontal to vertical).

14. Stormwater basins with pools of water shall have one or more of the following safety features:
    a. Safety ledges at the basin perimeter which are at least ten (10) feet wide.
    b. Aquatic vegetation surrounding the basin which discourages wading.
    c. Fencing to prevent unauthorized access to the basin.

15. Stormwater detention basins shall not be located in regulated wetlands unless approved by the Michigan Department of Environmental Quality.

16. Maintenance access shall be incorporated in the design of all detention and infiltration basins which are one-half (1/2) acre or more in size.

17. Stormwater detention basins, which impound five (5) acres or more and have a head of six (6) feet or more, shall meet dam construction permit requirements of the Michigan Water Resources Commission Act (Act 245 of 1929, as amended), as administered by the Michigan Department of Environmental Quality.

18. Stormwater detention and infiltration basins shall be maintained by the property owner following procedures specified in the Soil Erosion, Sedimentation and Stormwater Runoff Control Plan as approved by the Soil Erosion Control Officer.

E. Stormwater Conveyance Facilities and Receiving Waters

1. Unless otherwise approved, stormwater runoff shall be conveyed through grassed swales, vegetated buffer strips, or other approved facilities so as to decrease runoff velocity, to filter pollutants, to allow suspended sediments to settle, and to encourage infiltration.

2. If storm sewers are determined to be necessary by the Soil Erosion Control Officer, the applicant shall design the drainage system to mitigate any harmful impact on water quality by using structural devices or other methods to prevent accelerated soil erosion and by locating discharges to maximize overland flow through grassed swales.

3. Drain spouts from roofs and sump pumps from basements shall be directed to on-site swales, detention basins, or other measures designed to slow the flow of stormwater runoff to non-erosive velocities.

4. No direct or indirect discharge of stormwater to receiving bodies of water, including lakes, streams, or wetlands shall be allowed unless sediment is trapped prior to discharge and stormwater flows are limited to non-erosive velocities.

5. Lakes and streams, together with their adjacent banks, shall not be dredged, cleared of vegetation, deepened, widened, straightened, stabilized or otherwise altered without state or county permits. Approval from the Michigan Department of Environmental Quality is required for proposed alterations of lakes and streams below the ordinary high water mark. Approval from the Soil Erosion Control Officer is required for proposed alterations of lakes and streams above the ordinary high water mark.

6. Construction of floor drains, storm drains, drainage wells, septic systems, or other conduits by which stormwater or washwater containing oil, grease, toxic chemicals, or other hazardous substances may reach groundwater shall be prohibited unless proposed systems meet the requirements of the Michigan Department of Environmental Quality and the Antrim County Health Department.

F. Engineering Design Guidelines for Erosion, Sedimentation and Stormwater Control Management

1. Engineering design guidelines for erosion sedimentation and stormwater control management facilities shall follow best management practices and standards and specifications as identified by the Soil Erosion Control Officer, the Natural Resources Conservation Service (NRCS), and/or the Michigan Department of Environmental

Quality. The Soil Erosion Control Officer shall make the final determination in the event of conflicting design criteria from the various sources.

2. **Antrim County Soil Survey and Hydrologic Design Data**

The principal reference for determination of hydrologic soil groups and other soil parameters for use in the NRCS method of runoff and peak discharge computations is:

Soil Survey of Antrim County, Michigan (1977), US Department of Agriculture, Soil Conservation Service, *or as they may be amended.* A CD version is *available* from the enforcing agency or may be can be downloaded from the Antrim County website.

Hydrologic Soil Group maps are available from the enforcing agency or may be viewed on the Antrim County website.

Simplified rainfall-runoff tables can be used from the above data using:

US NRCS, Technical Release No. 16, *Rainfall-runoff Tables for Selected Runoff Curve Numbers*, April 1976, *or as they may be amended, and are available* from the enforcing agency or may be downloadable on their website.

The principal reference for applying the US NRCS method for runoff volume and peak discharges to small watersheds in rural Michigan is:

Michigan DEQ, July 2003, *Computing Flood Discharges for Small Ungaged Watersheds, or as they may be amended and are available* from the enforcing agency or may be downloadable.

3. **Erosion, Sedimentation and Stormwater Control Best Management Practices**

3.a The following reference provides design information on <u>erosion, sedimentation and stormwater control</u> measures:

The Michigan Department of Environmental Quality (MDEQ, Surface Water Quality Division, reprinted 1998) *Guidebook of Best Management Practices for Michigan Watershed or as they may be amended.* This manual is available from the enforcing agency or may be downloaded from their website.

3.b The following reference provides design information for <u>stormwater management</u> practices:

The Michigan Department of Environmental Quality (MDEQ, Land and Water Management Division, revised August 1999) *Stormwater Management Guidebook or as they may be amended.* This manual is available from the enforcing agency or may be downloaded in its entirety or by individual chapter on their website.

4. In all cases involving application of design guidelines for hydrology, soil erosion sedimentation and stormwater control measures, the decision of the Soil Erosion Control Officer on the appropriate design methodology (and any appropriate variation from the guidelines) shall be final.

G. Amendments

1. Amendments to these guidelines must be approved by the Antrim County Board of Commissioners.