

CHAPTER 7: ADDITIONAL REQUIREMENTS

This chapter presents additional requirements that may apply to storm water management systems in Wayne County.

7.1 Storm Water Conveyances

Storm water management systems may use watercourses or structures such as closed conduits, culverts, or bridges as a means of conveying stormwater runoff. Watercourses and closed conduits must be designed to standards described in this section. Storm water runoff conveyed within or under County Roads must also meet the additional requirements described in Section 7.3.

7.1.1 Watercourses

Natural watercourses should be preserved whenever possible. The Permit Office will not approve modifications to natural watercourses (e.g., installing a concrete channel or enclosure) unless the modification is necessary to address a demonstrated public safety, health or welfare issue. When such modifications are deemed necessary, the appropriate governmental agencies must be contacted for review and approval.

The flow capacity of each reach of a watercourse that is part of a storm water management system must be equal to or greater than the peak flow rate for a 10-year storm. The flow capacity of a watercourse must be calculated in accordance with the "Manning Formula" as follows:

$$Q = \frac{1.486 \times A \times R^{2/3} \times S^{1/2}}{n}$$

where:

- Q = flow capacity (cfs)
- A = cross sectional flow area (ft²)
- n = Manning's coefficient of roughness
- P = wetted perimeter (feet)
- R = hydraulic radius = (A/P in feet)
- S = hydraulic gradient (ft/ft)

In general, a minimum "n" of 0.035 will be used for the roughness coefficient unless special treatment is given to the bottom and side slopes, such as sodding, riprap or paving.



7.1.2 Closed Conduits

The flow capacity of each reach of a closed conduit that is part of a storm water management system must be equal to or greater than the peak flow rate for a 10-year storm. The Manning Formula (shown above) must be used to determine the flow capacity of a closed conduit.

The invert elevation of each closed conduit entering a forebay with a permanent pool must be equal to or greater than the permanent pool elevation.

The hydraulic grade lines (HGLs) of closed conduits must meet both of the following requirements:

- The hydraulic grade line must be calculated based on 10-year storm flows, starting with the crown elevation at the outlet. This gradient must not be higher than 2.5 feet below the rim elevation at any upstream manhole location. However, exceptions may be granted in special circumstances such as for managing storm water in and around truck docks.
 - For systems with forebays: The HGL starts at the crown of the pipe entering the forebay.
 - For systems with underground detention systems: The HGL starts at the crown of the pipe entering the manufactured treatment structure.
- The rim elevation at any manhole location along the closed conduit upstream of a detention system must be at least one (1) foot above the design water level of the detention system.

The minimum and maximum allowable closed conduit velocities are 2.5 and 8.0 feet per second, respectively. The maximum allowable velocity within the conduit may only be exceeded where special provisions have been made to dissipate energy.

The maximum distance between manholes, catch basins, and inlets may not exceed 300 feet plus 100 additional feet for every 1 foot of diameter for closed conduits over 36 inches in diameter.

Manholes or junction chambers must be constructed at all closed conduit junctions and angle points and at all changes in conduit size and/or slope.

The inlets and outlets for all closed conduits require an end treatment and soil stabilization measures, and some closed conduits may also require a grate to prevent entry into the conduit by children and animals. The specific requirements, which depend on the size of the conduit and the location/configuration of the inlet or outlet, are provided in Section 8.3.1.

7.1.3 County Road Culverts and Bridges

Under separate requirements administered by the Wayne County Permit Office, special provisions apply to culverts and bridges that convey a watercourse under a County Road, whether the culvert or bridge will be newly constructed or will be constructed to replace an existing culvert or bridge. If the watercourse is a County Drain, see Sections 7.4 and 7.5 for additional requirements that may apply.

The hydraulic capacities of culverts and bridges must be calculated using a method approved by the County. All bridges and culverts also must be designed with adequate soil erosion protection.

Bridges that convey a watercourse under a County Road must be designed to pass the peak flow rate for a 100-year storm with no harmful increase in backwater elevations. The 100-year storm elevation upstream of a bridge also must be at least one (1) foot below the lowest elevation of either the bridge deck or the approach pavements to the structure.

Culverts that convey a watercourse under a County Road must be designed to convey at least the peak flow rate for a 10-year storm, as determined using the methods described in Section 6.1.1. Culverts that will be inundated by storms larger than the design storm established by the Michigan Department of Transportation or the Michigan Department of Environmental

Quality must be designed with soil erosion protection that is adequate for the inundated condition.

7.2 Downstream Improvements

If the County determines that a proposed storm water management system does not include an adequate storm water outlet, the Applicant may be required to design and construct improvements to the downstream drain, watercourse or closed conduit. The County determines the extent to which downstream improvements may be required to provide an adequate storm water outlet.

7.3 County Roads

The County may establish additional or alternative requirements for storm water management systems in County Roads. Three such requirements are described below. Contact the Wayne County Permit Office for more information on these and other requirements.

1. The minimum diameter of closed conduits in County road rights-of-way is 12 inches.
2. As a general policy, Wayne County does not permit the discharge of storm water runoff from improved property abutting a County Road into the County Road storm drainage system. Exceptions to this policy can be made on the basis of economic hardship if (1) there are no other cost-feasible storm outlets available and (2) there is adjudged sufficient capacity in the Road storm drainage system. When exceptions are granted, the permitted storm discharge into the County Road storm drainage system is restricted to a discharge rate equal to the lesser of the following criteria based on a 10-year storm:
 - 0.103 cfs per station (100 feet) of County Road frontage available to the site;
 - 0.15 cfs per acre of area proposed to drain into the County Road drainage system.
3. Required design standards and construction specifications for storm water management systems in the County Road right-of-way must conform to Wayne County's most current standards. Information regarding these standards can be obtained from the Permit Office.

7.4 Easements

Pursuant to the Drain Code, Wayne County generally requires the following minimum easement widths for established County Drains and other watercourses.

1. An open County Drain or watercourse with a maximum bank to bank width that is 30 feet or greater must have an easement to the extreme width of the drain, plus 30 feet. The easement must be centered on the centerline of the drain or watercourse.
2. An open County Drain or watercourse with a maximum bank to bank width that is less than 30 feet must have an easement equal to the extreme width of the drain, plus 24 feet. The easement must be centered on centerline of the drain or watercourse.
3. Enclosed County Drains with an internal diameter of 8 feet or less must have an easement of 20 feet centered on the centerline of the enclosure.
4. Enclosed County Drains with an internal diameter that exceeds 8 feet must have an easement of 25 feet centered on the centerline of the enclosure.

The easement widths described above govern generally. The County may require an alternative width if the County determines that additional easement is required for proper construction, or because of special circumstances. Note that Wayne County does not allow any buffer strips required under the Storm Water Management Standards to overlap with County Drain easements. Exceptions to the easement requirements described above are within the County's sole discretion.

7.5 County Drains

Applicants who propose projects that would modify an established County Drain or an established drainage district may be subject to additional requirements. The Wayne County Drains Office is located within the Wayne County Department of Environment.

7.6 County Park Property

The County may establish additional or alternative requirements for storm water management systems in County park property or which outlet within County park property. For example, special provisions apply to inlets/outlets on County park property as described in Section 8.3.1 and Appendix E-1. Specific requirements for restoration of County Park property disturbed by construction are presented in Appendix E-4.

7.7 Wetlands

The natural drainage pattern of the land within a development site must not be altered in any way that may cause adverse

affects to existing wetland areas. Untreated storm water will not be permitted to outlet directly into a natural or mitigation wetland area. The level of treatment required to discharge storm water runoff to a natural or mitigation wetland area is determined by MDEQ. However, at a minimum, storm water discharged into a natural or mitigation wetland must pass through a pretreatment system. The pretreatment system must be designed in accordance with the requirements described in Section 6.3.1.

In addition to Wayne County approval of the storm water management system for a development project, the design of any wetland created for mitigation must also be approved by MDEQ.

7.8 Temporary Measures during Construction

As described in Chapter 3, projects that involve earth change activities may need to implement temporary storm water management measures to comply with additional federal NPDES requirements that apply to construction activity that disturbs one or more acres of land. More information about the NPDES requirements is available from MDEQ's Water Bureau; see Chapter 12 for contact information.

Projects that involve earth change activities also may need to implement temporary storm water management measures under the state Soil Erosion and Sedimentation Control (SESC) program and Wayne County's Soil Erosion and Sedimentation Control Ordinance, Chapter 94 of the Code of Ordinances of Wayne County (2001). More information about these programs and the types of projects that require a permit under these programs is available in Chapter 3.

Projects within Wayne County that must obtain a SESC permit from WCDOE must comply with the measures described in this section. An overview of the permit process is shown in Figure 7-1. WCDOE will not issue a SESC permit for a project that requires a storm water construction approval from the Permit Office until storm water construction approval has been obtained. Additional information about Wayne County's SESC program, and a downloadable copy of the permit application package, is available from the County's website (http://waynecounty.wc/mygovt/doe/depts/lrmd/Programs/sesc/permit_info.aspx).

7.8.1 General Earth Change Requirements

In conformance with the state SESC program and the SESC Ordinance, Wayne County generally requires the following temporary measures during construction:

- The proposed work shall be carried out in accordance with approved earth change plans and in compliance with all requirements of the permit and state laws and regulations.
- Earth changes must be conducted in a manner that effectively reduces accelerated soil erosion and resulting sedimentation.
- Persons engaged in earth change activities must, in conformance with state law, implement and maintain acceptable soil erosion and sedimentation control measures that effectively reduce accelerated soil erosion.
- Earth changes must be scheduled and completed in a manner that will limit the exposed area of any disturbed land for the shortest possible period of time, as determined by WCDOE.
- Sediment caused by accelerated soil erosion must be removed from runoff water before it leaves the site of the earth change.
- Temporary or permanent facilities designed and constructed for the conveyance of water around, through or from the earth change area must be designed to limit the water flow to a non-erosive velocity.
- Temporary soil erosion control measures must be maintained until permanent soil erosion measures are installed and approved. Permanent soil erosion control measures must be maintained for a minimum of one year after the project passes WCDOE's "completion inspection."
- Permanent soil erosion control measures for all slopes, channels, ditches, or any other disturbed land area must be completed within five calendar days after final grading or earth moving activity has been completed.
- Soil tracked, spilled, dumped or deposited onto public streets, highways, sidewalks, or other public thoroughfares must be removed promptly.
- Permittees shall notify the WCDOE as to when the "project completion" inspection can be made.

7.8.2 General Plan Requirements

Under state law and the SESC Ordinance, three sets of earth change plans must be submitted before regulated earth changes may commence. The plans must be sealed by a

Professional Engineer or Landscape Architect registered in the State of Michigan.

Each set of earth change plans must include drawings of the earth change at a scale not more than 100 feet to the inch, including a legal description; a site location map which includes the proximity of any proposed earth change to lakes, streams or wetlands; existing structures; existing contour intervals which clearly show the character of the land; proposed contour intervals which clearly show the future character of the land; and a description of the existing vegetation on the site.

Each set of earth change plans must also include details for the proposed earth changes, including:

- Location of the physical limits of each proposed earth change including the location of temporary soil stockpile areas. If soil is to be removed from the site, the location of the offsite disposal area must be identified.
- A description and location of all existing and proposed on-site drainage facilities, including detailed storm sewer plans, drainage arrows for surface drainage, and the ultimate drainage outlet for the site.
- Time and sequence of each proposed earth change with approximate dates for major grading activities, including site stripping, rough grading and cut and fill; construction of detention basin, roads and underground utilities, digging basements and backfilling lots; final grading, landscaping paving. This sequence must include a description of temporary erosion control measures to prevent sediment from leaving the project site during each of the proposed earth change activities. A description and location of all proposed temporary and permanent soil erosion control measures.
- Approved standard details of all temporary and permanent soil erosion control measures.

7.8.3 Wayne County Plan Requirements

Wayne County imposes additional requirements for earth change plans. In addition to the general plan requirements discussed above, the following design and maintenance features must be shown on the plan and included in the construction sequence:

- A perforated riser pipe with stone filter must be installed on all open detention basins and sediment basins on projects five acres or more in size.
- A temporary crushed rock tracking pad must be installed at the construction entrance and exit. This tracking pad must be maintained with fresh stone periodically. Construction traffic must be limited to designated entrance and exit.
- Street scraping and cleaning (sweeping) must be conducted on a regular schedule. At a minimum, one sweeping must occur each week, and one scraping must occur at the end of each workday.
- Paved storm sewer inlets must be protected by a single sheet of filter fabric conforming to Geotex
- III P as manufactured by Synthetic Industries, Inc. or equivalent woven monofilament filter fabric (ASTM flow rate = 110 gallons per minute/per square foot).
- Catch-all type inlet filters are required at all low points in the paved roads of multi-family housing projects.
- Rear yard (beehive-type) storm sewer inlets must be protected by a woven geotextile filter fence 24 inches in height securely fixed with lath and staples to hardwood stakes spaced no more than four feet on center. The silt fence must be trenched in a minimum of six inches into the ground.
- All catch basins and inlets in areas that are determined to be susceptible to flooding must have catch-all type inlet filters.
- All exposed earth must be stabilized with seed and mulch or sod within five days of final grade. Sediment basins must be stabilized with seed and straw mulch blankets. Straw blankets must be staked into the ground five days after the construction of the sediment basin.
- An undisturbed, vegetative buffer strip of at least 25 feet must be retained around rivers, creeks, streams, wetlands, drains, and other sensitive areas.
- Straw mulch blankets must be used on 3:1 slopes or greater. (Three foot horizontal, one foot vertical)
- Ditches, swales, and other areas that will channel concentrated runoff must be stabilized within five days of construction. Temporary rock check dams must be installed to slow water to non-erosive velocities in areas of concentrated flow.
- Road rights-of way must be stabilized with seed and mulch within five days of completing utility work in the right of way.
- Areas of earth change that are disturbed beyond the fall seeding deadline (November 1) may require dormant seeding and straw mulch securely anchored to the ground.
- Single family lots, during construction, must have a silt fence barrier and a temporary crushed rock tracking pad installed as per the approved plan.
- A single family residence, prior to receiving a Certificate of Occupancy, must have a silt fence barrier, or 15 feet of mulch blanket installed back of the curb across the entire front of the lot. The silt fence must be trenched in a minimum of six inches into the ground
- Rip rap must be immediately installed after construction of outlets and culverts.

7.8.4 Performance Deposit

WCDOE does not issue SESC permits for an earth change unless the permittee first posts with Wayne County a bond, certified check, or irrevocable bank letter of credit in the amount equal to that which would be required for the surety bond. If a bond is used, it must be executed by the permittee and a corporate surety with authority to do business in this state as a surety. The bond must be in the amount of the established total cost of the earth change work authorized by the permit, but in no case may the bond amount be for less than \$1,500.00 per acre of earth change.

Each bond must provide assurance for the maintenance of the finished project for a period of one year after the "project completion" inspection is made. Deposits or bonds shall be submitted to the WCDOE with the permit application. Upon permit issuance, the bond will be posted with the County Clerk by the WCDOE.

No performance deposit is required for a permit classified as a single-family residence.

7.8.5 Inspections and Enforcement

Once an application for a permit is received by WCDOE and before a permit is issued, an initial site investigation is made in the field. After permit issuance, earth change inspections are made periodically to assure compliance with the permit, state law, and the SESC Ordinance. When all grading is complete and all permanent erosion control measures are installed, a project completion inspection is made prior to permit expiration. Finally, one year after the completion inspection, a final inspection is made to ensure that permanent erosion control measures are still functioning effectively.

NOTE: No earth change work (grading, excavation, fill, topsoil, stripping, etc.) within 500 feet of a lake, stream, or drain or that disturbs more than one acre of land may begin until a permit is issued under state law. Such earthwork which begins without a permit is violation of the law and subject to legal proceedings.

7.8.6 Extension of Permit

If the permittee is unable to complete the work within the 30 month permit period, he must present in writing to the WCDOE, a request for an extension of the permit. Requests for extension shall be made at least ten (10) days before permit expiration. If, in the opinion of the WCDOE, such an extension is warranted, additional time may be granted for the completion of the work. An additional permit and inspection fee is required to extend the permit.

7.8.7 Modifications of Approved Plans

All proposed modifications of the approved earth change plans must be submitted to and approved by the WCDOE. All necessary specifications and related reports shall be submitted with any proposal to modify the approved earth change plan. No earthwork in connection with any proposed modifications is permitted without the approval of the WCDOE.

FIGURE 7-1

PROCEDURE FOR OBTAINING A
SOIL EROSION AND SEDIMENTATION CONTROL PERMIT

