Appendix H

Model Ordinances

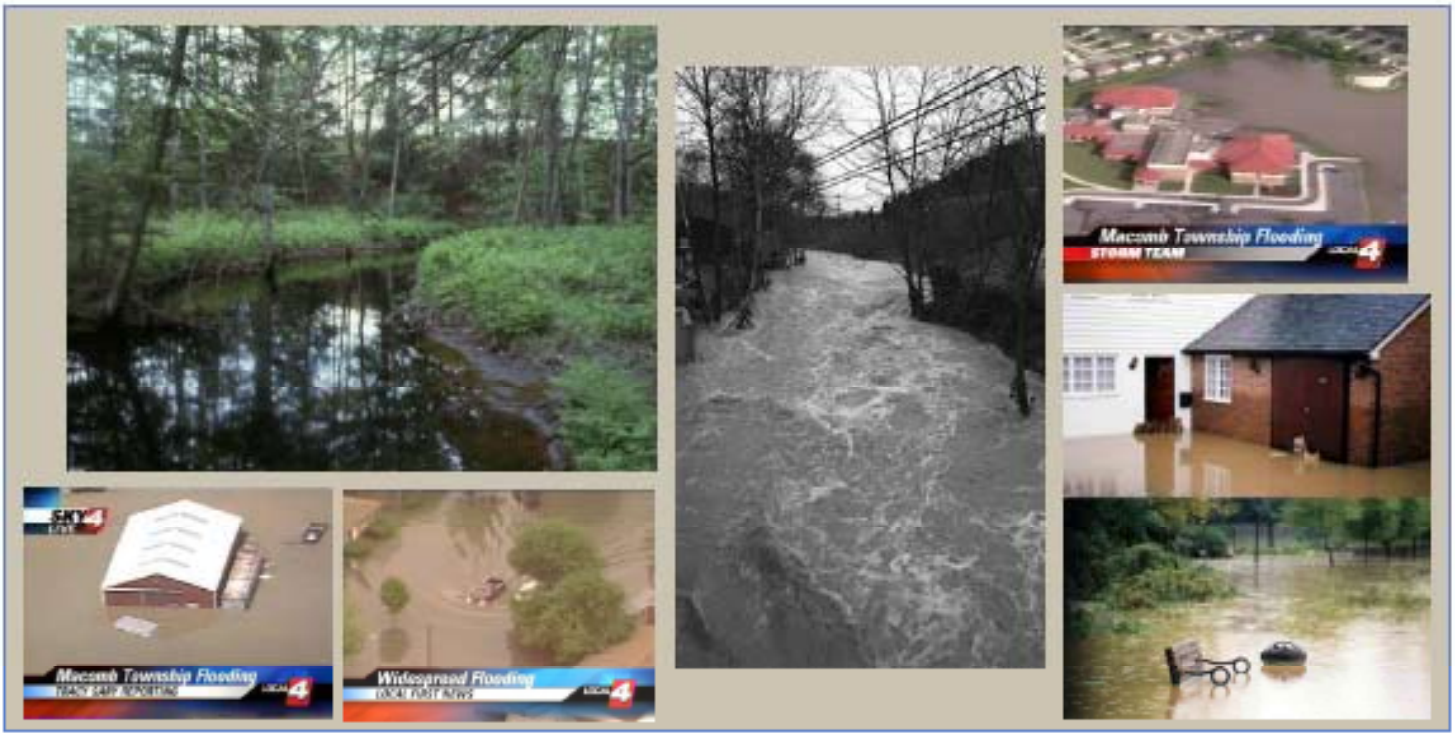
This appendix contains model ordinances that serve as general guidance to assist local communities interested in implementing water resource protection ordinances. These ordinances are NOT legal advice.

Details of both substance and process in an ordinance will vary by community based on local conditions and institutional structures. A first step in preparing an ordinance is to engage local stakeholders including elected officials, engineers, and planners. Proposed ordinances should not be finalized without advice and involvement of legal counsel.

This appendix contains a model LID stormwater ordinance. This model ordinance was specifically developed to accompany this manual to provide additional guidance to communities interested in regulating LID implementation in their community.

In addition, there are other ordinances that can be implemented at the local level that implement LID principles. This appendix contains summary sheets and web links to model ordinances developed for Macomb County Planning and Economic Development. These topics include: native vegetation, flood prevention, natural features setback, trees and woodlands, resource protection overlay, and wetlands.

Flood Prevention District



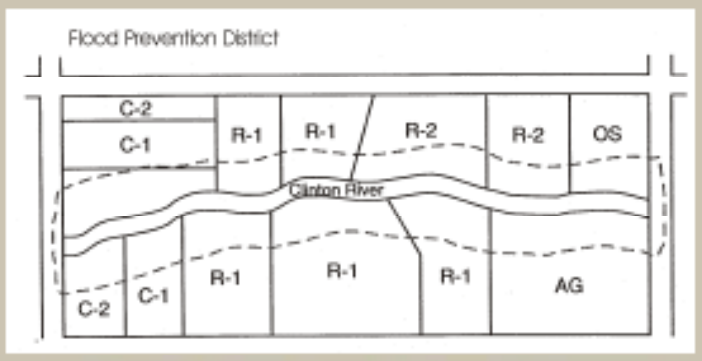
PURPOSE & HIGHLIGHTS OF ORDINANCE

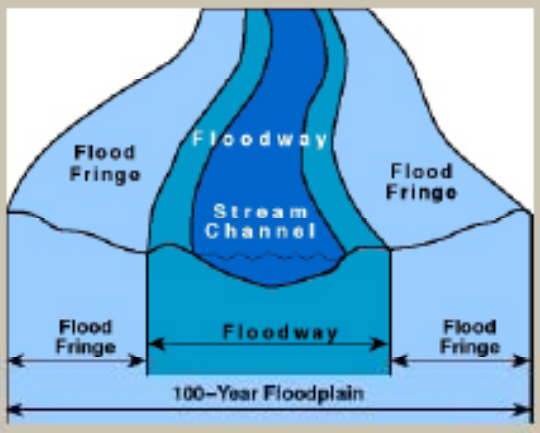
- The purpose of the Flood Prevention District is to protect the natural, human, structural, and economic resources of the community through application of special regulations for the use of land which is, or may be, subject to periodic inundation by floods and floodwaters at predictable intervals.
- Although unseen, floodplains are integral assets of communities and provide numerous benefits including:

1. Storing flood waters. Floodplains reduce the velocity of flood waters and peak flows downstream thereby decreasing property damage and other potential hazards to people residing or working in the floodplain.
2. A floodplain can also improve water quality by filtering out pollutants and sediment and recharging groundwater.
3. Vegetated floodplains can stabilize soils during floods, thus reducing the amount of sediment carried downstream.
4. Floodplains provide habitat for plants and animals and are particularly important as breeding and feeding areas.
5. Floodplains are also excellent areas for open space, parks, greenways, and recreation areas, all of which protect the natural functions of the floodplain.

For additional information contact The Macomb County Department of Planning & Economic Development
586-469-5285

Application





- The Flood Prevention District functions as an overlay zoning district. Properties within the district retain their underlying zoning classifications, but are subject to additional requirements specified in the flood prevention ordinance.
- The Flood Prevention District is divided into two (2) areas, the "floodway" and "flood fringe", which coincide with FEMA's flood insurance rate maps and floodway maps.
- A development permit must first be obtained from the proper community authority before any development or substantial improvements can be undertaken in these areas.
- The ordinance requires that uses vulnerable to floods be protected against flood damage at the time of initial construction and be constructed by methods and practices that minimize adverse impacts on the function of the floodplain.
- New construction or substantial improvement of any structure should have the lowest floor, including the basement, elevated to one foot above base flood elevation.
- The ordinance controls filling, grading, dredging, obstructions and other developments which may increase erosion or flood damage.
- The construction of flood barriers are also regulated through the ordinance.

For additional information visit www.macombcountymi.gov/planning/model_ordinances.htm

Native Vegetation

PURPOSE & HIGHLIGHTS OF ORDINANCE

- The purpose of the ordinance is to encourage the use of desirable native species of plants for all landscaping and to maximize the use of native plant species in landscaping all areas of a site, including but not limited to; foundation plantings, lawn areas, screening and greenbelt areas, and surface storm water conveyance features. Preservation of existing native plant species should be strongly encouraged through the ordinance and landscaping standards.

- ***Native plants*** are well adapted to local conditions, therefore requiring little maintenance once established. They eliminate or significantly reduce the need for fertilizers, pesticides, and water. They also often attract beneficial insects, which prey upon pests, decreasing the need for pesticides. Native plants are less expensive to maintain, most species are perennial or self-seeding biennial plants, they promote biodiversity, and maintain our natural heritage and our community's character. Additionally, they improve water quality by filtering contaminated stormwater, performing stormwater infiltration, and reduce soil erosion by stabilizing soils with their deep root systems.

- ***Invasive plants*** are not native to the area, have no natural controls and are able to out-compete and gradually displace native plants. Not all non-native plants are harmful. An important rule of thumb is to "do no harm". Non-native, non-invasive species are the second best choice.

- The native plants that grow in a community are crucial because they uniquely perform environmental functions that keep our natural environment healthy.

For additional information contact The Macomb County Department of Planning & Economic Development
586-469-5285

Application

- Native plant guidelines can easily be integrated into most landscaping ordinances because they cover new ideas in landscaping and often do not conflict with existing provisions. Communities can also adopt a native vegetation ordinance that would contains a larger range of native plant provisions to direct the use of native vegetation.
- The landscaping requirements should include a prohibited plant species list that consist of exotic invasive plant species, which have no natural controls and are able to out-compete and gradually displace native plants. It is important to update this list as new information on invasive plants becomes available.
- Native plant regulations and guidelines should promote:
    1. The use of native species in landscaping and plantings.
    2. The education of land development professionals about the possibilities of using native plants.
    3. Private "naturally landscaped" lots, which consist of taller plants, not much mown lawn, and are arranged to emulate nature.
    4. The rescue and transplantation of appropriate native plant species on development sites.
    5. The removal of exotic invasive plant species.
    6. Environmentally sound maintenance practices, which in turn reduces the amount of maintenance and water required, greatly reduces the need for chemical fertilizers and pesticides, and reduce emissions from gas powered landscaping equipment.

For additional information visit www.macombcountymi.gov/planning/model_ordinances.htm

Natural Feature Setback

PURPOSE & HIGHLIGHTS OF ORDINANCE

- In general, the purpose of a natural feature setback is to minimize the potential impacts of adjacent land uses on the natural feature and maximize the long-term viability of the natural feature. The setback area is often vegetated and in many cases left in its natural state. Setbacks are commonly used to protect a community's water resources such as rivers, lakes, streams, marshes, etc. but can be used for any type of natural feature.
- Setbacks perform a number of significant functions including reducing water temperature; filtering sediments and other contaminants from stormwater; reducing nutrient loads to lakes; stabilizing stream banks with vegetation; providing riparian wildlife habitat; maintaining and protecting fish habitats; forming aquatic food webs; and providing a visually appealing greenbelt and recreational opportunities.
- Establishing the width of a setback so it is effective depends on the type and sensitivity of the natural feature and the expected impacts of surrounding land uses. The wider the setback or buffer the more protection it provides. The twenty-five (25) foot setback established by this model ordinance represents a compromise between scientific evidence, experience, and practicality. As a result, the ordinance is less restrictive on property owners, yet provides some measure of environmental protection. It is up to individual communities to develop setback requirements for varying natural features.
- For the purpose of this ordinance the definition of a natural feature means wetlands or watercourses, as they are defined by the Michigan Department of Environmental Quality (MDEQ). However, natural features can be more broadly defined to include, but not limited to, endangered species habitat, 100-year floodplain, landmark trees, steep slopes, and woodlands.

For additional information contact The Macomb County Department of Planning & Economic Development
586-469-5285

Application

- The community body undertaking the plan review has the responsibility of determining if the natural features setback and its requirements are applicable to the property development located in or adjacent to a natural feature. The service of a wetland consultant may be utilized in making such determinations.
- The setback from the natural feature should be measured from the edge of the wetland or from the ordinary high water mark of a watercourse, depending on the circumstance.
- Within the natural feature setback there should be no construction, removal or deposit of any structures or soils, including dredging, filling or land balancing unless determined to be in the public interest. In addition, no vegetation cutting or removal within the natural feature setback should occur before all site plan approvals have been obtained.
- In determining whether proposed construction or operations are in the public interest, the benefit of the development shall be balanced against the foreseeable detriments. The ordinance sets forth general criteria to be used in undertaking this balancing test. If there remains a debatable question, authorization of the development within the natural feature setback should not be granted.
- The activities permitted within a natural feature setback should be carefully considered by each community adopting a setback ordinance. This is the part of the ordinance where the community's goals for an ordinance are most clearly conveyed. The permitted activities described here can become more or less restrictive based on what the community is trying to achieve.
- The ordinance exempts certain activities from regulation. For example, installation of a fence within a setback, maintenance of previously established lawn areas, seasonal recreation structures for watercourse uses, and the planting of non-invasive trees and vegetation, but not the use of fertilizer.

For additional information visit www.macombcountymi.gov/planning/model_ordinances.htm

Resource Protection Overlay District

PURPOSE & HIGHLIGHTS OF ORDINANCE

- Adoption of an overlay district ordinance is an effective method for communities to protect a specific natural feature of an area. The overlay district does not replace existing regulations, but rather supplements them with language designed to protect significant ecosystems.

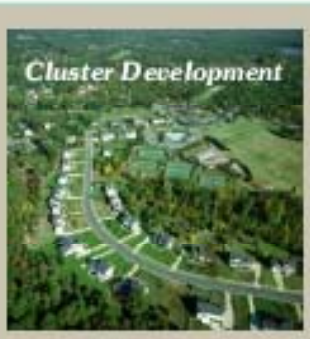
- The purpose of the Resource Protection Overlay District is to ensure that the physical elements of property development are designed and arranged to protect the priority resource protection areas both on the site and in the vicinity of the site, as identified by a community in map(s) in their Master Plan. The procedures established in the Resource Protection Overlay District enable the applicant and the community to achieve the mutually compatible objectives of reasonable use of land and protection of vital resources.

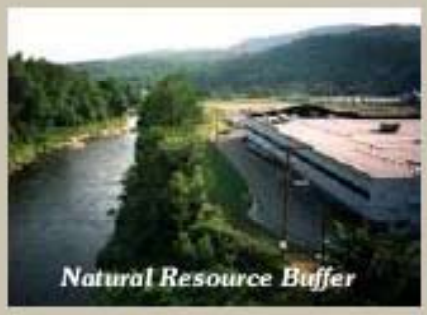
- Overlay districts can be particularly effective when they include provisions that: 1) Protect trees and other vegetation; 2) Enforce setbacks from sensitive natural areas; 3) Require open space preservation; and 4) Protect identified mating, nesting, and other critical habitat areas.

- Maps that show areas intended for resource protection should be a component of this ordinance. Data from the Michigan Natural Features Inventory for Macomb County and data from Michigan land conservancies such as the Macomb Land Conservancy, Southeast Michigan Land Conservancy, and the Nature Conservancy, may be helpful when creating map(s) for resource protection. The Macomb County Planning Department has much of this information on file and may be of assistance to communities in developing resource protection maps.

For additional information contact The Macomb County Department of Planning & Economic Development
586-469-5285

Application

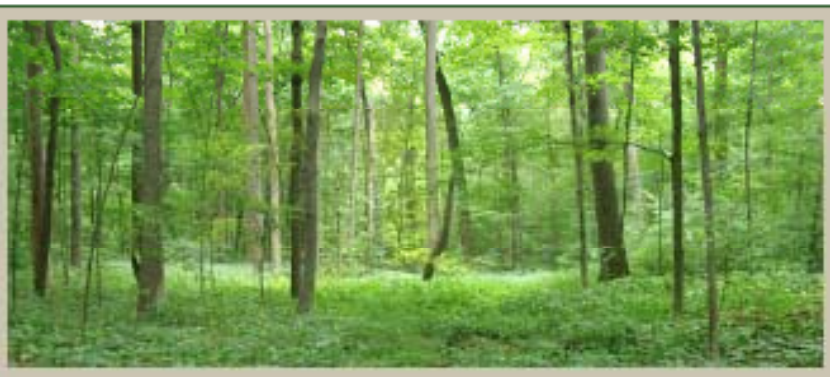




- Before any site in an overlay zone can be developed, the applicant must propose areas of priority protection. The community then reviews these areas and determines if they meet the community's goals of resource protection. If acceptable, the community establishes on the project development plan, areas of priority protection and indicates the specific area(s) of a site within which the developed project may be constructed and within which the development activity must be contained.
- No construction activity should be permitted within priority protection areas whether to provide for a building site, on-site utilities or services, or for any roads or driveways unless permitted by the community. Examples of permitted uses in priority protection areas include: restoration of degraded areas, construction of trails, and other such activities that do not degrade the natural environment.
- The developer of a site may be required to supply a report prepared by a qualified professional detailing the wildlife, plant life, and/or other natural characteristics in need of protection in order for the community to properly apply the review standards established under the Ordinance.
- Buffer zones should be established adjacent to areas of priority protection. In determining the size and location of buffer zones the community must look at the compatibility of the approved use and the sites natural features and the extent the development might affect the function of the natural area.
- Projects located within a Resource Protection Overlay District, should be designed to complement the visual context of the natural area. Techniques such as architectural design, site design, the use of native landscaping, colors, and building materials are all means to achieve the desired effect.
- Site development plans should preserve and provide new connections between priority protection areas both across the site and between adjacent properties. Such connections should allow for wildlife movement between natural areas.

For additional information visit www.macombcountymi.gov/planning/model_ordinances.htm

Tree and Woodland Protection







PURPOSE & HIGHLIGHTS OF ORDINANCE

- Trees are an important natural resource that offer both environmental and aesthetic benefits for people, animals, and plants. They produce oxygen, provide wildlife habitat, improve water quality, prevent erosion, moderate temperature, reduce air and noise pollution, enhance aesthetics and property values, and are an important contributor to community image, pride, and quality of life.

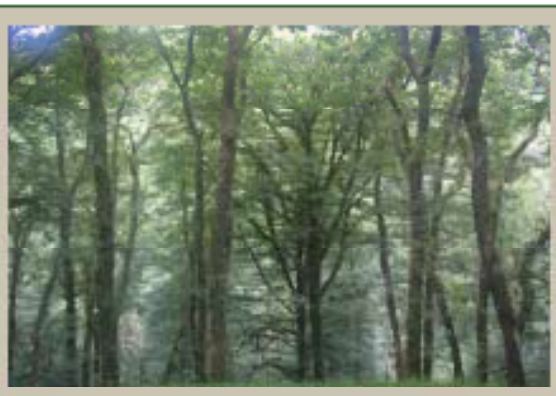
- The goal of tree and woodlands preservation ordinances is to provide for the protection, preservation, and proper maintenance of trees and woodlands in order to prevent damage to them so they may continue to provide their many benefits. The ordinance should encourage creative design and construction techniques that will preserve as many trees, both as individuals or as woodland areas. The ordinance should prohibit the unnecessary removal of trees on undeveloped land and discourage the unnecessary removal of trees and woodland resources in connection with the development of land.

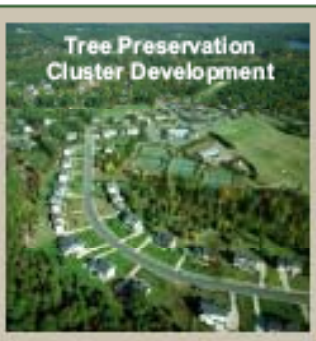
- To enhance the effectiveness, the ordinance should be supported by the goals and objectives of a community's Master Plan. Protection efforts can be reinforced and enhanced by integrating woodland/tree standards and regulations into requirements for landscaping and/or site plan review.

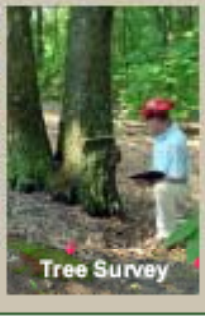
- Inventories, maps, and other information on a community's tree resources can be used to identify areas of priority protection and to measure the effectiveness of the ordinance based on the change in tree resources over time.

For additional information contact The Macomb County Department of Planning & Economic Development
586-469-5285

Application







- The ordinance requires that a tree removal permit be obtained before any tree of a specified diameter, as determined by the community, can be removed, transplanted, or destroyed.
- Part of the application for a tree removal permit is a plan, the most notable element of which are: A site inventory of trees greater than a specified diameter, stating size, species, and location; Trees proposed to remain, to be transplanted, or to be removed; Location of structures, building envelope, utilities, and driveway and the area around them to be disturbed; The species, cost, size, and number of replacement trees; and How remaining trees will be protected.
- Preservation and conservation of wooded areas, trees, woody vegetation, wildlife, and related natural resources and processes shall have priority over development when there are feasible and prudent location alternatives on site for proposed buildings, structures, or other site improvements. The community has discretion to require reasonable adjustments to achieve that goal.
- Any proposed tree relocation or replacement should be specified in the application, including a drawing and detailed explanation of the proposal. A description of the types, sizes, and location of replacement trees should be stated in the ordinance.
- Tree and woodland protection ordinances typically contain additional protection criteria for landmark trees, specimens of exceptional size, form, species, or historic significance.

For additional information visit www.macombcountymi.gov/planning/model_ordinances.htm

Wetland and Watercourse Protection and Restoration

Purpose & Highlights of Ordinance

- The importance of wetlands to water quality and the protection of our lakes and rivers can't be overstated. Wetlands large and small play a critical role in:

  1. Flood and storm water storage;
  2. Reducing the velocity of stormwater, which protects shorelines and stream banks from erosive forces of waves and high water flows, and allows sediments to settle out of the water before entering lakes and streams;
  3. Protecting water quality by removing and breaking down sediments, nutrients, and toxins;
  4. Providing floral diversity and wildlife habitat protection;
  5. Creating fishery habitat, and habitat for reptiles and amphibians; and
  6. Providing aesthetics and recreational opportunities.

- Adopting a wetlands ordinance is the only real way to regulate wetlands, because the ordinance applies local knowledge and resources to preservation of a local natural feature. Through the Natural Resources and Environmental Protection Act of 1994 (Act 451), state and federally protected wetland areas include those that are more than five acres, and wetlands of any size that are contiguous with other water bodies, such as streams, rivers, and lakes. This law also provides the legal authority for local governments to adopt more restrictive regulations that can protect wetlands that are less than five acres. The Michigan Department of Environmental Quality (MDEQ) encourages protection of smaller wetlands which perform functions as important as the larger wetlands yet are often under greater pressure from development.

- It is important that the Master Plan articulate the community's goals in preserving wetlands. These goals can be general in nature and can be linked with other environmental protection objectives. The Master Plan should also include a map that depicts areas of particular sensitivity and areas for potential protection.

For additional information contact The Macomb County Department of Planning & Economic Development
586-469-5285

Application

- An essential component of preserving wetlands and watercourses is controlling the type of activities that are permitted within them. Therefore, the ordinance requires a wetland use permit be obtained before any activities can take place within the wetland that may have a negative impact on the wetland's natural function.
- A wetlands map is a requirement of a local wetlands ordinance. This map does not need to be absolutely precise but is rather a guide to the location of wetlands. The map in conjunction with aerial photographs and field inventories, done on a case-by-case basis, are used to administer the wetland ordinance.
- If the community's wetlands map indicates a wetland may exist on a development property then a survey must be performed to delineate the precise boundaries of the wetland on the project site. The delineation of the boundaries is the responsibility of the applicant and must be verified by the community.
- Application for approval, appeal, and issuance of wetland use permits should be concurrent with the application of other necessary community approvals. The applicant must submit a completed form supplied by the MDEQ, a wetland delineation survey, soil drainage and stormwater management plans, and a mitigation plan if the proposed activity will result in the loss of wetland resources.
- Michigan's wetland protection laws require that local governments define wetlands in the same way as they are defined under state statute.

For additional information visit www.macombcountymi.gov/planning/model_ordinances.htm

Model LID Stormwater Ordinance

This model ordinance is based on a draft ordinance developed by Environmental Consulting and Technology, Inc., a model ordinance developed by Cahill and Associates, and a model ordinance developed by the Kent County Drain Commissioner Stormwater Management Task Force.

Reviewed by: JFNew

Carlisle Wortman Associates

Macomb County Planning and Economic Development

This model ordinance is general guidance to assist local communities interested in implementing a stormwater ordinance. This ordinance is NOT legal advice.

Details of both substance and process in an ordinance will vary from community to community based on local conditions and institutional structures. A first step in preparing a stormwater ordinance is to engage local stakeholders including elected officials, engineers, and planners. Proposed ordinances should not be finalized without advice and involvement of legal counsel.

AN ORDINANCE to provide for the regulation and control of stormwater runoff, which results in protecting <Insert Community Name> waterways and sensitive areas in the community. This ordinance is intended to protect sensitive areas and local waterways, but at the same time allowing the designer the flexibility in protecting these resources.

ARTICLE I. TITLE, FINDINGS, PURPOSE

Section 1.01 Title

This ordinance shall be known as the "<Insert Community Name> Stormwater Management Ordinance" and may be so cited.

Section 1.02 Findings

<Insert Community Name> finds that:

- Water bodies, roadways, structures, and other property within, and downstream of <Insert Community Name> are at times subjected to flooding.
- Land development alters the hydrologic response of watersheds, resulting in increased stormwater runoff rates and volumes, increased flooding, increased stream channel erosion, increased sediment transport and deposition, and increased nonpoint source pollutant loading to the receiving water bodies and the Great Lakes.
- Stormwater runoff produced by land development contributes to increased quantities of water-borne pollutants.
- Increases of stormwater runoff, soil erosion, and nonpoint source pollution have occurred as a result of land development, and have impacted the water resources of the <Insert Watershed name> Watershed.
- Increased stormwater runoff rates and volumes, and the sediments and pollutants associated with stormwater runoff from future development projects within <Insert Community Name> will, absent proper regulation and control, adversely affect <Insert Community Name> water bodies and water resources, and those of downstream municipalities.

- Stormwater runoff, soil erosion, and nonpoint source pollution can be controlled and minimized by the regulation of stormwater runoff from development.
- Adopting the standards, criteria and procedures contained in this ordinance and implementing the same will address many of the deleterious effects of stormwater runoff.
- The constitution and laws of Michigan authorize local units of government to provide stormwater management services and systems that will contribute to the protection and preservation of the public health, safety, and welfare and to protect natural resources.

Section 1.03 Purpose

It is the purpose of this ordinance to establish minimum stormwater management requirements and controls to accomplish, among others, the following objectives:

A. To minimize increased stormwater runoff rates and volumes from identified land development;

B. To minimize nonpoint source pollution;

C. To minimize the deterioration of existing watercourses, culverts and bridges, and other structures;

D. To encourage water recharge into the ground where geologically favorable conditions exist;

E. To maintain the ecological integrity of stream channels;

F. To minimize the impact of development upon streambank and streambed stability;

G. To control non-stormwater discharges to stormwater conveyances and reduce pollutants in stormwater discharges;

H. To preserve and protect water supply facilities and water resources by means of controlling increased flood discharges, stream erosion, and runoff pollution;

I. To reduce the adverse impact of changing land use on water bodies and, to that end, this ordinance establishes minimum standards to protect water bodies from degradation resulting from changing land use where there are insufficient stormwater management controls;

J. To ensure that storm drain drainage or stormwater BMPs are adequate to address stormwater management needs within a proposed development, and for protecting downstream landowners from flooding and degradation of water quality. The procedures, standards, and recommendations set forth in this Ordinance and the State of Low Impact Development Manual for Michigan are designed for these purposes; and

K. To ensure that all stormwater facilities necessary for a proposed development will have an appropriate governmental unit responsible in perpetuity for performing maintenance or for overseeing the performance of maintenance by a private entity, such as a property owners' association.

Section 1.04 Construction of Language

For purposes of this Ordinance, the following rules of construction apply:

A. Particulars provided by way of illustration or enumeration shall not control general language.

B. Ambiguities, if any, shall be construed liberally in favor of protecting natural land and water resources.

C. Words used in the present tense shall include the future, and words used in the singular number shall include the plural, and the plural the singular, unless the context clearly indicates the contrary.

D. Terms not specifically defined in this Ordinance shall have the meaning customarily assigned to them.

E. Considering that stormwater management in many cases requires sophisticated engineering design and improvements, some of the terms of this Ordinance are complex in nature. Effort has been made to simplify terms to the extent the subject matter permits. In addition, assistance and examples will be provided by or on behalf of the <Insert Community Name> as needed for the interpretation and understanding of this Ordinance.

ARTICLE II: DEFINITIONS

Section 2.01 Definition of Terms

The following terms, phrases, words, and derivatives shall have the meaning defined below:

> **Note to Ordinance Developer:**
> **Additional Definitions**
>
> Your community may want to add definitions pertinent to the community. For example, define "township" or "city" to shorten the full local community name throughout the ordinance.

Applicant. Any person proposing or implementing the development of land.

BMP or "Best Management Practice". A practice, or combination of practices and design criteria that comply with the Michigan Department of Environmental Quality's Guidebook of BMPs for Michigan Watersheds, and Low Impact Development Manual for Michigan, or equivalent practices and design criteria that accomplish the purposes of this Ordinance (including, but not limited to minimizing stormwater runoff and preventing the discharge of pollutants into stormwater) as determined by the <Insert Community Name> Engineer, Environmental Consultant and/or, where appropriate, the standards of the <Insert County Name> County Drain Commissioner.

Conveyance facility. A storm drain, pipe, swale, or channel.

Design Engineer. The registered professional engineer responsible for the design of the stormwater management plan.

Detention. A system which is designed to capture stormwater and release it over a given period of time through an outlet structure at a controlled rate.

Developed or Development. The installation or construction of impervious surfaces on a development site that require, pursuant to state law or local ordinance, <Insert Community Name> approval of a site plan, site condominium, special land use, planned unit development, rezoning of land, land division approval, private road approval, or other approvals required for the development of land or the erection of buildings or structures; provided, however, that for the purposes of Article II only, developed or development shall not include the actual construction of, or an addition, extension, or modification to, an individual single-family or a two-family detached dwelling.

Engineered Site Grading Plan. A sealed drawing or plan and accompanying text prepared by a registered engineer or landscape architect which shows alterations of topography, alterations of watercourses, flow directions of stormwater runoff, and proposed stormwater management and measures, having as its purpose to ensure that the objectives of this Ordinance are met.

Grading. Any stripping, excavating, filling, and stockpiling of soil or any combination thereof and the land in its excavated or filled condition.

Impervious Surface. Surface that does not allow stormwater runoff to slowly percolate into the ground.

Infiltration. The percolation of water into the ground, expressed in inches per hour.

Maintenance Agreement. A binding agreement that sets forth the terms, measures, and conditions for the maintenance of stormwater systems and facilities.

Offsite Facility. All or part of a drainage system that is located partially or completely off the development site which it serves.

Peak Rate of Discharge. The maximum rate of stormwater flow at a particular location following a storm event, as measured at a given point and time in cubic feet per second (CFS).

Plan. Written narratives, specifications, drawings, sketches, written standards, operating procedures, or any combination of these which contain information pursuant to this Ordinance.

Retention. A holding system for stormwater, either natural or man-made, which does not have an outlet to adjoining watercourses or wetlands. Water is removed through infiltration and/or evaporation processes.

Runoff. That part of precipitation, which flows over the land.

Sediment. Mineral or organic particulate matter that has been removed from its site of origin by the processes of soil erosion, is in suspension in water, or is being transported.

Storm Drain. A conduit, pipe, swale, natural channel, or man-made structure which serves to transport stormwater runoff. Storm drains may be either enclosed or open.

Stormwater BMP. Any facility, structure, channel, area, process or measure which serves to control stormwater runoff in accordance with the purposes and standards of this Ordinance.

Stormwater Plan. Drawings and written information prepared by a registered engineer, registered landscape architect, or registered surveyor which describe the way in which accelerated soil erosion and/or stormwater flows are proposed to be controlled, both during and after construction, having as its purpose to ensure that the objectives of this Ordinance are met.

Swale. Defined contour of land with gradual slopes that transport and direct the flow of stormwater.

Watercourse. Any natural or manmade waterway or other body of water having reasonably well defined banks. Rivers, streams, creeks, brooks, and channels, whether continually or intermittently flowing, as well as lakes and ponds are watercourses for purposes of stormwater management.

Watershed. An area in which there is a common outlet into which stormwater ultimately flows, otherwise known as a drainage area.

Wetlands. 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, as defined by state law.

ARTICLE III. GENERAL PROVISIONS

Section 3.01 Applicability

These procedures and standards set forth in this Ordinance and the BMP design information found in the State of Low Impact Development Manual for Michigan provide minimum standards to be complied with by developers and in no way limit the authority of the <Insert Community Name> to adopt or publish and/or enforce higher standards as a condition of approval of developments.

Note to Ordinance Developer:
Applicability

The community should review the types of developments that are applicable to these ordinance provisions. For example, if your community has a NPDES stormwater permit, it requires post-construction runoff control on new development and redevelopment disturbing greater than one acre.

Except for those activities expressly exempted by Section 3.02, every development requiring a site plan review in the <Insert Community Name> shall have either:

1) a Stormwater Plan and detailed construction plans for stormwater BMPs, or
2) an Engineered Site Grading Plan.

The applicability of these plans is dependent on the type of activity, as listed below. No development or preparation for development on a site shall occur unless and until an application has been submitted and approved for a Stormwater Plan or Engineered Site Grading Plan.

A. Requirement for a Stormwater Plan

A Stormwater Plan shall be submitted and reviewed in accordance with requirements of Article IV. Approval of final development plans, site plans, and final preliminary subdivision and condominium plans shall not be granted prior to approval of the Stormwater Plan. The following types of developments and earth changes require a Stormwater Plan:

1. Land development proposals subject to site plan review requirements in the <Insert Community Name> Zoning Ordinance.
2. Subdivision plat proposals.
3. Site condominium developments pursuant to the Condominium Act, P.A. 59 of 1978 as amended; MCLA 559. 101 et. seq.
4. Any development on property divided by land division where more than three parcels of less than one acre are created.
5. Any proposal to mine, excavate, or clear and grade, compact, or otherwise develop one acre or more of land for purposes other than routine single-family residential landscaping and gardening, or any proposal within 500 feet of the top of the bank of an inland lake or stream.
6. Development projects of federal, state, and local agencies and other public entities subject to the <Insert Community Name> NPDES Permit for Municipal Separate Storm Sewer Systems.
7. Maintenance of a stormwater basin constructed prior to the effective date of the regulations of which this subsection is a part.
8. For developments and earth changes not listed above or specifically exempted in Section 3.02, a Stormwater Plan shall be submitted and reviewed in accordance with the requirements of Article V unless otherwise determined by the <Insert Title> or his/her designee.

B. Requirement for an Engineered Site Grading Plan

An Engineered Site Grading Plan shall be submitted and reviewed in accordance with requirements of Article VI. The Engineered Site Grading Plan shall be approved by the <Insert Title> or his/her designee prior to the issuance of any building permit. The following types of new construction of single-family housing units require an Engineered Site Grading Plan:

1. Development on acreage parcels (lot splits) for which a Stormwater Plan is not required.
2. Development on platted subdivision lots.
3. Development on site condominium lots.

Section 3.02 Exemptions

A. Notwithstanding the requirements of Section 3.01, neither a Stormwater Plan nor an Engineered Site Grading Plan shall be required for activities protected by the Right to Farm Act 93 of 1981.

B. Routine single-family residential landscaping and/or gardening which conforms to the Stormwater Plan or Engineered Site Grading Plan approved by the <Insert Community Name>, and which does not otherwise materially alter stormwater flow from the property in terms of rate and/or volume.

C. Development on one single-family lot, parcel, or condominium unit where the <Insert Title> or his/her designee determine that, due to the size of the site, or due to other circumstances, the quantity, quality, and/or rate of stormwater leaving the site will not be meaningfully altered.

D. The installation or removal of individual mobile homes within a mobile home park. This exemption shall not be construed to apply to the construction, expansion, or modification of a mobile home park.

E. Plats that have received preliminary plat approval and other developments with final land use approval prior to the effective date of this Ordinance, where such approvals remain in effect.

ARTICLE IV. STORMWATER PLAN REQUIREMENTS

Section 4.01 Pre-application Conference

A pre-application conference shall be held with the <Insert Community Name> prior to the submittal of a Stormwater Plan and before any alterations to the land. The purpose of the pre-application conference is to provide information about plan submittal requirements, and <Insert Community Name> and county regulations.

Section 4.02 Contents of Stormwater Plan

A. Plan Presentation

1. Through plans, illustrations, reports, and calculations, the Stormwater Plan shall display the required information specified in Section 4.02.D.
2. The Stormwater Plan must be sufficiently detailed to specify the type, location, and size of stormwater management facilities, using preliminary calculations. Detailed construction drawings are not required at the Stormwater Plan review stage.
3. If it is proposed to develop a parcel in two or more phases, the Stormwater Plan shall be prepared and submitted for the total project.

B. Plan Preparation

The Stormwater Plan shall be prepared by a registered civil engineer. Other persons and professionals may assist in the preparation of the plan.

C. Scale for Mapping

The Stormwater Plan shall be drawn to a scale as, <Insert scale information>

D. Required Information

1. The location by means of a small location map, drawn to a scale no less than 1" = 2000'.
2. Zoning classification of petitioner's parcel and all abutting parcels.
3. The location and description of all on-site features and all adjacent off-site features within 50 feet, and all other off-site features that may be impacted in determining the overall requirements for the development. This includes:
   a. Existing site topography with contours at two-foot intervals or less based on the NAVD88 datum
   b. Adjoining roads and developments
   c. Railroads
   d. High tension power lines or underground transmission lines
   e. Cemeteries
   f. Parks
   g. Natural and artificial watercourses, wetlands and wetland boundaries, environmental feature boundaries, floodplains, lakes, bays, existing stormwater storage facilities, conveyance swales (natural or artificial) with identification of permanent water elevations
   h. Location of woodlands
   i. Designated natural areas
   j. Any proposed environmental mitigation features
   k. Drains, sewers, and water mains
   l. Existing and proposed easements
   m. A map, at the U.S.G.S. scale, showing the drainage boundary of the proposed development and its relationship with existing drainage patterns

n. Boundaries of any off-site drainage area contributing flow to the development

o. Any watercourse passing through the development, along with the following:

   i. Area of upstream watershed and current zoning

   ii. Preliminary calculations of runoff from the upstream area for both the 100-year and two-year 24-hour design storms, for fully developed conditions according to the current land use plan for the area

p. Soil borings may be required at various locations including the sites of proposed retention/detention and infiltration facilities, and as needed in areas where high groundwater tables or bedrock near the surface exist

q. Proposed site improvements including lot divisions and building footprints

r. Preliminary stormwater BMP information including:

   i. Location of all stormwater BMPs

   ii. Identification of stormwater quality and quantity treatment facilities and method of stormwater conveyance

   iii. Preliminary sizing calculations for stormwater quality and quantity, including preliminary estimates of runoff volume captured by BMPs, (e.g., infiltration losses,) for treatment facilities

   iv. Preliminary tributary area map for all stormwater management facilities indicating total size and average runoff coefficient for each subarea

   v. Analysis of existing soil conditions and groundwater elevation and bedrock depth (including submission of soil boring logs) as required for proposed retention and infiltration facilities

s. Preliminary landscaping plan for stormwater BMPs

t. Preliminary easements for stormwater management facilities

u. Required natural features setbacks

v. Drinking water wells, public wellheads, Wellhead Protection Areas (WHPAs), underground storage tanks, and brownfields

w. Any areas of unique geological formations (i.e., karst areas)

Note to Ordinance Developer:
Standards within Ordinance vs. Engineering Standards

The stormwater standards can be detailed in either the zoning ordinance, a stand-alone ordinance, or in a separate engineering standards document.

Section 4.03 Standards for Stormwater Management Plan Approval

All developments requiring a Stormwater Plan shall be designed, constructed, and maintained to prevent flooding, minimize stream channel impacts, protect water quality, and achieve the purposes of this Ordinance, as stated above. <Insert Community Name> has adopted performance standards to meet the objectives of managing the quantity and quality of stormwater runoff from a site as detailed below <or in community engineering standards>.

Note to Ordinance Developer:
Redevelopment

The community needs to decide if the standards are going to be applied the same across all covered areas. For example, is redevelopment going to be held to the same standards as new development? Such variances to LID controls should balance the need for improved stormwater control over the present condition without providing unrealistic burdens on landowners.

Designers may select any combination of stormwater BMPs which meet the performance standards provided the selections:

(1) comply with the requirements identified in this Ordinance;

(2) comply with other local, county, state, or federal requirements; and

(3) do not conflict with the existing local stormwater management and watershed plans.

The particular facilities and measures required on-site shall take into consideration the natural features, upland areas, wetlands, and watercourses on the site; the potential for on-site and off-site adverse stormwater impacts, water pollution, and erosion; and the size of the site.

A. On-Site Stormwater Management

1. Natural topography and site drainage shall be preserved and site grading shall be minimized to the maximum extent reasonably achievable considering the nature of the development.
2. The preferred conveyance strategy is to transport wherever possible untreated and treated runoff in conveyance facilities open to the atmosphere (e.g. swales, vegetated buffer strips, energy-dissipating structures, etc.), rather than through enclosed pipes, so as to decrease runoff velocity, allow for natural infiltration, allow suspended sediment particles to settle, and to remove pollutants.
3. Watercourses shall not be deepened, widened, dredged, cleared of vegetation, straightened, stabilized, or otherwise altered without applicable permits or approvals from the <Insert Community Name>, relevant county agencies and the applicable State of Michigan Department(s).
4. The following volume/channel protection criteria shall be met. No net increase in runoff from storm events up to the two-year, 24-hour event from presettlement conditions unless local information and analysis is available that determines that less than two-year is adequate.

4a. This volume shall be retained on-site through infiltration within 72 hours, through storage and reuse, through evapotranspiration, or a combination. This does not preclude the use of off-site volume controls in accordance with section 4.07 to achieve volume control for storm events that are the same or greater. (Waivers to this requirement can be found in section C).

4b. Retaining this volume meets water quality criteria described in Number 6 below.

4c. Those granted a waiver shall detain the runoff from storm events up to the one-year, 24-hour event and release over 24 hours.

5. The following peak rate/flood control criteria shall be met. The peak discharge rate from all storms up to the 100-year, 24-hour event shall not be greater than presettlement discharge rates. Where the runoff volume is not increased from the presettlement condition, the peak rate corresponding to the same storms is considered controlled.

Note to Ordinance Developer: Channel Protection and the Great Lakes

The ordinance may want to include exemptions from the channel protection criteria for water bodies that are so large that the added volume from localized stormwater runoff is insignificant, or where channel erosion will not occur for other reasons. These water bodies include the Great Lakes and their connecting channels and lakes with rock or concrete-lined channels leading to the Great Lakes (e.g., Muskegon Lake). Implementing the channel protection criteria may still be desired in these situations to maintain groundwater recharge or control localized flooding.

Note to Ordinance Developer: Channel Protection Goal

If the volume of runoff is not held to the presettlement condition, channel protection cannot be assured even with additional peak rate control.

Note to Ordinance Developer: Water Quality Criteria

- There are a number of ways to determine the volume of runoff necessary to treat for water quality. These include:
- 0.5 inch of runoff from a single impervious area.
- One inch of runoff from all impervious areas and 0.25 inch of runoff from all disturbed pervious areas.
- One inch of runoff from disturbed pervious and impervious areas.
- 90 percent of runoff producing storms.

The community needs to decide if they are going to specifically require one of these methods. A more detailed discussion of each of these methods is available in Chapter 9 of the Low Impact Development Manual for Michigan.

5a. If specific watershed conditions require additional peak rate control, the community can a) restrict the peak discharge from the 100-year, 24 hour event to a fixed release rate of <X> cfs/acre; or b) require additional runoff volume reduction up to the <X> year, 24-hour storm.

6. The following water quality criteria shall be met. Water quality criteria are met when retaining the volume control criteria.

6a. For those areas not retaining the volume criteria, the site shall be designed to remove 80 percent of Total Suspended Solids from the stormwater runoff through a combination of BMPs. These BMPs include, but are not limited to:

- Constructed wetlands/wetland forebays
- Retention ponds/extended detention ponds
- Filters (sand-peat, underground sand, perimeter sand filter, organic sand, pocket sand filter, gravel, others)
- Grassed/vegetated swales and channels
- Vegetated filter strips
- Other bioretention BMPs

7. Under certain conditions, <Insert Community Name>, upon recommendation by the <Insert Community Name> Engineer, may impose the following additional restrictions on stormwater discharges:

   a. Peak discharge may be further restricted when it can be shown that a probable risk to downstream structures or unique natural areas exists or that existing severe flooding problems could be further aggravated.

   b. Measures shall be imposed to protect against ground or surface water pollution where the nature of the soils or bedrock underlying a stormwater management structure constitutes substantial risk of contamination, such as might be the case in limestone formations. Special provisions to be followed in these cases will be provided by the <Insert Community Name> Engineer.

   c. Where groundwater yields are very low or where a groundwater supply already is heavily used, <Insert Community Name> may require that the entire volume of the two-year, 24-hour rainfall event be retained and infiltrated. If substantial irrigation needs are anticipated, portions of stored stormwater may be reused for irrigation purposes.

8. The Runoff Curve Number Method, sometimes referred to as TR55, shall be used for estimating runoff volumes. The presettlement conditions shall be based solely on woods or meadow. All disturbed pervious areas that are not restored according to the stormwater credits (section 4.03b) shall be assigned a curve number that reflects a "fair" hydrologic condition as opposed to a "good" condition. Other methodologies are acceptable with the review and approval of the <Insert Community Name> Engineer.

9. The NRCS Unit Hydrograph Method shall be used for calculating the peak rate of runoff for presettlement conditions and undisturbed areas. Other methodologies are acceptable with the review and approval of the <Insert Community Name> Engineer.

Note to Ordinance Developer:
Flood Control

The community should identify the level of flood control needed, identify if LID design criteria can meet those needs and, if not, what amount of additional peak rate/flood control to include in the ordinance. This may include:

- Base the discharge rates on the presettlement discharge rates if the two-year, 24-hour volume is retained.
- Base the discharge rate on a watershed specific analysis.

In Michigan, peak rate has largely been controlled through the use of a fixed release rate. Fixed release rate controls can continue to be used for additional flood control over what LID controls provide.

Another option to the fixed release rate is allowing a percentage of the presettlement peak rate to be discharged. For example,

- The six-month to two-year storms do not exceed 75 percent of presettlement peak rates,
- Two-year storms up to the 10-year storm do not exceed 80 percent of presettlement peak rates, and
- For all storms larger than the 10-year storm, do not exceed 85 percent of presettlement peak rates.

10. *Rainfall Frequency Atlas of the Midwest* (Huff and Angel, 1992) shall be used for all applicable stormwater calculations. Other rainfall sources are acceptable with the review and approval of the <Insert Community Name> Engineer.

B. Stormwater Credits for Onsite Stormwater Management

As set forth in the State of Low Impact Development Manual for Michigan, it is the intent of <Insert Community Name> to maximize use of preventive nonstructural Best Management Practices (BMPs) and certain structural BMPs. The following nonstructural and structural BMPs provide a quantitative stormwater benefit and credits which are described in Table H.1. These include:

- Minimize Soil Compaction
- Protection of Existing Trees (part of Minimize Total Disturbed Area)
- Soil Restoration
- Native Revegetation
- Riparian Buffer Restoration

C. Waiver from the Volume Control Criteria for On-site Stormwater Management

A waiver from retaining the volume criteria must be based on demonstration by the applicant on the items listed below, which could include that existing soil, bedrock, water table, and/or other natural constraints are pervasive at the site, such that presettlement conditions generate substantially increased volumes of stormwater runoff before the proposed development occurs. Furthermore, such presettlement site constraints would also make infiltration-oriented best management practices to be used for volume control extremely difficult or potentially a hazard to apply at the site.

Note to Ordinance Developer:
Stormwater Credits

The community may decide to include stormwater credits to encourage the use of certain BMPs. Credits as recommended here are used in the design process to emphasize the use of BMPs that when applied alter the disturbed area in a way that reduces the volume of runoff from that area.

Credits are given for five BMPs because they enhance the response of a piece of land to a storm event rather than treat the runoff that is generated. These BMPs are encouraged because they are relatively easy to implement over structural controls, require little if any maintenance, and the land they are applied to remains open to other uses. The credit only works with designs based on the Curve Number or CN method of analysis described in Chapter 9 of the Low Impact Development Manual for Michigan. Credit is applied by modifying the CN variable so that the amount of runoff generated from an event is reduced.

Table H.1
BMP Credits

BMP	Credit
Minimize Soil Compaction and Soil Restoration	Areas (acres) complying with the requirements of these BMPs can be assigned a Curve Number (CN) reflecting a "good" condition instead of "fair" as required for other disturbed pervious areas. For example, lawn areas with B soils would be given a CN of 61 instead of 69; lawns with C soils a CN of 74 instead of 79.
Protection of Existing Trees (part of Minimize Total Disturbed Area)	Trees protected under the requirements of this BMP can be assigned a Curve Number (CN) reflecting a woods in "good" condition for an area of 800 square feet per tree or the entire area of the tree canopies protected, whichever is greater.
Native Revegetation and Riparian Buffer Restoration	Proposed trees and shrubs to be planted under the requirements of these BMPs can be assigned a Curve Number (CN) reflecting a woods in "good" condition for an area of 200 square feet per tree or the estimated tree canopy, whichever is greater. For shrubs, an area of 25 square feet per shrub.

In using and crediting these BMPs, applicants must meet the review criteria located within the discussion of each BMP (Chapters 6 and 7).

Waivers shall be submitted with the Stormwater Plan. Those submissions granted a waiver shall meet the standards set forth in Section 4.03. 4c, 5a, and 6a. To be considered for a waiver, the applicant must submit the following:

1) **Extent of site area with seasonal high water table (less than two feet to water table)**: As extent of site areas with seasonal high water table increases, presettlement runoff volume increases, and feasibility for volume/infiltration BMPs decreases, given the inability of infiltration to occur when water table is high.
2) **Extent of site area with less than two feet to bedrock**: As extent of site areas with shallow depth to bedrock increases, presettlement runoff volume increases, and feasibility for volume/infiltration BMPs decreases, given the inability of infiltration to occur.
3) **Extent of site area with less than 0.25 inch/hour permeability**: Sites with extremely "heavy" soils in situ, regardless of soil survey designations, indicate greater presettlement runoff volumes with lesser infiltration volumes. Soil permeability must be tested onsite. Preferred permeability rate after recommended soil testing should be 0.25 inch per hour (can be reduced to 0.10 inch per hour or projects where low density is being proposed and large site areas are available for infiltration). Sites entirely classified as Hydrologic Soil Group (HSG) D may be assumed to be infeasible without recommended soil testing. Soil testing shall be based on the soil infiltration testing protocol included in the State of Low Impact Development Manual for Michigan.
4) **Extent of the site area constrained by foundation or required setbacks**: Setbacks must be established between infiltration stormwater BMPs and the following structures:
   - Basement foundations (50 feet up gradient, 10 feet down gradient),
   - On-site septic systems/drainfields (50 feet),
   - Wells (100 feet), and
   - Other building elements, which could be affected by infiltration systems.
5) **Extent of size of site**: Practically speaking, the larger the site, the more flexibility and opportunity for accommodating runoff volume/infiltration BMPs, all else being equal; as site size increases, waiver requirements grow more stringent. Size of site relates also to the extent of proposed building/impervious area. The more intense (defined both in terms of building coverage and total impervious area) the proposed building program, the more difficult accommodating the required runoff volume becomes.

D. Special Provisions for "Hot Spot" Land Uses for On-site Stormwater Management

For all those projects involving land uses considered to be high pollutant producers or "hot spots" (see Table H.2 e.g., vehicle service and maintenance facilities, vehicle salvage yards and recycling facilities, vehicle and equipment cleaning facilities, fleet storage areas for buses, trucks, etc., industrial/commercial or any hazardous waste storage areas or areas that generate such wastes, industrial sites, restaurants and convenience stores, any activity involving chemical mixing or loading/unloading, outdoor liquid container storage, public works storage areas, commercial container nurseries, and some high traffic retail uses characterized by frequent vehicle turnover), additional water quality requirements may be imposed by the Engineer in addition to those included in water quality criteria in order to remove potential pollutant loadings from entering either groundwater or surface water systems. These pre-treatment requirements are included in Tables H.2 and H.3.

Section 4.04 Plan Submission

A. <X> copies or as specified by the <Insert Community Name>, of the Stormwater Plan required under Section 5.01 shall be submitted to the <Insert Community Name> for initial staff review and pre-application conference.

B. For developments subject to site plan review, the applicant shall submit the same number of copies of the Stormwater Plan as required for site plan review at the time that the preliminary site plan is submitted.

C. For developments subject to subdivision plat review, the applicant shall submit the same number of copies of a Stormwater Plan as required for plat review at the time that the tentative preliminary plan is submitted.

Table H.2
Pre-Treatment Options for Stormwater Hot Spots

Stormwater Hot Spots	Minimum Pre-Treatment Options
Vehicle Maintenance and Repair Facilities	A, E, F, G
Vehicle Fueling Stations	A, D, G
"Fast Food" Restaurants	B, C, D, I, K
Convenience Stores	B, C, D, I, K
Outdoor Chemical Mixing or Handling	G, H
Outdoor Storage of Liquids	G
Commercial Nursery Operations	I, J, L
Other Uses or Activities Designated by Appropriate Authority	As Required

Table H.3
Minimum Pre-Treatment Options

Minimum Pre-Treatment Options	
A	Oil/Water Separators / Hydrodynamic Separators
B	Sediment Traps/Catch Basin Sumps
C	Trash/Debris Collectors in Catch Basins
D	Water Quality Inserts for Inlets
E	Use of Drip Pans and/or Dry Sweep Material under Vehicles/Equipment
F	Use of Absorbent Devices to Reduce Liquid Releases
G	Spill Prevention and Response Program
H	Diversion of Stormwater away from Potential Contamination Areas
I	Vegetated Swales/Filter Strips
J	Constructed Wetlands
K	Stormwater Filters (Sand, Peat, Compost, etc.)
L	Stormwater Collection and Reuse (especially for irrigation)
M	BMPs that are a part of a Stormwater Pollution Prevention Plan (SWPPP) under a NPDES Permit

D. For other earth changes or activities subject to Stormwater Plan requirements, the plan shall be submitted to the <Insert Community Name> before construction drawings are submitted.

E. Compliance with the requirements of this Ordinance does not eliminate the need for the proprietor to obtain required permits and approvals from county and state agencies.

F. Compliance with the requirements of this Ordinance does not eliminate the need for the proprietor to comply with other applicable <Insert Community Name> ordinances and regulations.

G. Upon submission of a Stormwater Plan, as provided above, such plan shall be forwarded to the Engineering and Environmental Consultants for review and recommendation to the Planning Commission. If the site plan, subdivision plat, or other earth change plan is revised, then the Stormwater Plan shall also be revised and re-reviewed by the Engineering and Environmental Consultants to ensure continued compliance with all other applicable ordinances.

Section 4.05 Review Procedures

A. All Stormwater Plans, including waiver submissions, shall receive engineering and environmental review.

1. If the proposed plan is not sufficient as originally submitted, the <Insert title> will notify the applicant in writing, setting forth the reasons for withholding a recommendation for approval, and will state the changes necessary to obtain approval.

B. Planning Commission Review

1. The Planning Commission shall, following recommendation by the <Insert Community Name> staff and consultants, review Stormwater Plans, including waiver submissions in conjunction with the submitted site plan or subdivision plat.
2. If the Planning Commission determines that all of the required information has not been received, the proprietor may request that the matter be tabled to allow for the submittal of the required information.
3. If all the required information has been received, the Planning Commission shall recommend approval, recommend approval with conditions, or recommend denial of the Stormwater Plan, including waiver submissions. Recommendations for action on the Stormwater Plan can be part of the recommendation for action on the site plan or subdivision plat.

Note to Ordinance Developer:
Review Procedures

This review process includes review by the Planning Commission. Although stormwater review is not necessarily listed in state law for Planning Commissioners' responsibility, their input would be consistent with other local review processes (e.g., site plan review).

C. <Insert Community Name> Board Review

1. The <Insert Community Name> Board/Council shall, following recommendation by the Planning Commission review the Stormwater Plan, including waiver submissions in conjunction with the submitted site plan or subdivision plat.
2. The <Insert Community Name> Board/Council shall approve, approve with conditions, or deny approval of the Stormwater Management Plan.
3. If the plan is approved, the <Insert Community Name> will require the following as a condition of approval.
   a. Before approval of the final plan, copies of all necessary Wetland, Floodplain, Inland Lakes and Streams, Erosion Control or other needed state, federal, or local permits relating to stormwater management have been provided by the applicant for the <Insert Community Name> file.
   b. A satisfactory agreement that assures long-term maintenance of all drainage improvements will be in place before submission of the final plan. Documentation of maintenance agreement will be supplied to the <Insert Community Name> and approved by the <Insert Community Name> Board/Council.
   c. The applicant will post cash or a letter of credit in an amount not less that 10 percent of the cost of the stormwater facilities for projects of less than $100,000 or five percent of the cost for projects over $100,000 (See Sections C and D below). This deposit will be held for one year after the date of completion of construction and final inspection of the stormwater facilities, or until construction on all phases in the development are completed, whichever time period is longer.
   d. This deposit will be returned to the applicant (in the case of cash) or allowed to expire (in the case of a letter of credit), as provided above, provided all stormwater facilities are clean, unobstructed, and in good working order, as determined by the <Insert Community Name> Engineer.
   e. Reproducible mylars and electronic files (in AutoCAD format) of the as-built storm drains and stormwater BMPs will be submitted by the applicant or his/her engineer to the <Insert Community Name> along with the final plan, or upon completion of system construction. The mylars are to be of quality material and three mils in thickness.

f. Complete development agreements (including deed restrictions) must be submitted for the <Insert Community Name> review and approval prior to recording.

Section 4.06 Review Fees

The <Insert Community Name> Board/Council shall establish application fees and escrow requirements by resolution. Fees and escrow account payments shall be sufficient to cover administrative and technical review costs anticipated to be incurred by the <Insert Community Name> including the costs of on-site inspections.

Section 4.07 Off-Site Stormwater Management

A. Requirements

1. In lieu of on-site stormwater BMPs, the use of off-site stormwater BMPs and storm drains may be proposed. Off-site stormwater BMPs shall be designed to comply with the requirements specified in Section 4.03 and all other standards provided by this Ordinance that are applicable to on-site facilities.
2. Off-site stormwater management areas may be shared with other landowners, provided that the terms of the proposal are approved by the <Insert Community Name> Board/Council and <Insert Community Name> Attorney. Approval hereunder shall not be granted for off-site stormwater BMPs unless the applicant demonstrates to the <Insert Community Name>, following recommendation by the <Insert Community Name> staff, that the use of off-site stormwater management areas shall protect water quality and natural resources to an equal or greater extent than would be achieved by the use of on-site stormwater management areas.
3. Adequate provision and agreements providing for maintenance and inspection of stormwater management facilities shall be made, and the documents, in recordable form, recorded instrument, including an access easement, approved by <Insert Community Name>.
4. Accelerated soil erosion shall be managed off-site as well as on-site.

B. Performance Guarantees, Inspections, Maintenance, and Enforcement

1. All provisions for performance guarantees shall apply to off-site stormwater conveyance and detention.

Section 4.08 Revision of Plan

If it becomes necessary to alter a development or earth change proposal after the Stormwater Plan has been approved, a revised Stormwater Plan must be submitted, reviewed, and approved in accordance with the procedure set forth above. All requirements and standards for Stormwater Plans shall apply.

Section 4.09 Drains Under the Jurisdiction of the Drain Commissioner

A. Drainage districts will not be altered when designing development drainage, except as provided under Section 433 of Act 40, Public Act 1956 as amended.

B. Existing county drain easements will be indicated on the plans as well as the final plan and will be designated as "<Insert County Name> County Drain" as applicable. County drain easements prior to 1956 were not required by statute to be recorded immediately; therefore, it may be necessary to check the permanent records of the Drain Office to see if a drain easement is in existence on the subject property.

C. A permit will be obtained from the Drain Commissioner's Office prior to tapping or crossing any county drain. The permit must be obtained prior to final plan approval.

D. Proposed relocations of county drains will be processed through the office of the Drain Commissioner.

ARTICLE V. STORMWATER BMP CONSTRUCTION PLANS

Section 5.01 Submittal, Review and Approval Procedures Requirements

A. The applicant will submit five copies of final construction plans for stormwater BMPs with a letter of transmittal submitted to the <Insert Community Name> with the final site plan /subdivision plan review. Construction or building permits shall not be issued until approval of the construction plans.

The construction plans shall be drawn to a scale no smaller than 1" = 50', and on sheets no larger than 24" x 36". The scales used shall be standard engineering scales and shall be consistent throughout the plans. When plans have been completed with computer aided design technology, locations should be geo-referenced and a copy of the electronic file shall also be provided. The construction plans shall include:

1. Proposed stormwater management facilities (plan and profile).
2. Proposed storm drains including rim and invert elevations.
3. Proposed open channel facilities including slope, cross section detail, bottom elevations, and surface material.
4. Final sizing calculations for stormwater quality and quantity treatment facilities and stormwater conveyance facilities.
5. Storage provided by one (1) foot elevation increments.
6. Tributary area map for all stormwater management facilities indicating total size and average runoff coefficient for each sub-area.
7. Analysis of existing soil conditions and groundwater elevation (including submission of soil boring logs) as required for proposed retention and infiltration facilities.
8. Details of all stormwater BMPs including but not limited to:
   i. Outlet structures.
   ii. Overflow structures and spillways.
   iii. Riprap.
   iv. Manufactured treatment system.
   v. Underground detention cross section and product details.
   vi. Cross section of infiltration and/or bioretention facilities.
9. Final landscaping plan and details.
10. Final easements for stormwater management facilities.
11. Maintenance plan and agreement.

B. Construction drawings and engineering specifications shall be subject to review and approval by the <Insert Community Name> Engineer and Environmental Consultants to ensure that the construction plan conforms with the approved Stormwater Plan and that adequate storm drainage will be provided and that the proposed stormwater management system provides adequately for water quantity and quality management to ensure protection of property owners and watercourses both within the proposed development and downstream.

C. A construction permit shall not be issued unless the detailed engineering drawings and specifications meet the standards of this Ordinance, applicable <Insert Community Name> ordinances, engineering standards and practices, and any applicable requirements of other government agencies. Additionally, the following information is required to be submitted:

1. A soil erosion permit under "The Michigan Soil Erosion and Sedimentation Control Act", P.A. 451, Part 91 Public Acts of 1994 as amended, will be obtained from the appropriate agency prior to any construction.
2. For developments that will result in disturbance of five or more acres of land, a complete Notice of Coverage

must be submitted to the Michigan Department of Environmental Quality, Water Bureau, to have the discharge deemed authorized under a National Pollutant Discharge Elimination System permit.

3. The applicant will make arrangements acceptable to the <Insert Community Name> for inspection during construction and for final verification of the construction by a registered professional engineer prior to approving Certificate of Occupancy.
4. Review of construction plans by the <Insert Community Name> will not proceed until site plan approval has been granted.
5. Approval of construction plans by the <Insert Community Name> is valid for one calendar year. If an extension beyond this period is needed, the applicant will submit a written request to the <Insert Community Name> for an extension. The <Insert Community Name> may grant one year extensions of the approval, and may require updated or additional information if needed. <Insert Community Name> action under this provision may be taken administratively provided that no changes to the plans and/or standards have occurred. In the event one or more such changes have occurred, <Insert Community Name> action under this provision shall be taken by the final reviewing body.
6. For site condominiums, complete Master Deed documents (including "Exhibits" drawings) must be submitted for the <Insert Community Name> review and approval prior to recording.

Section 5.02 As-Built Certification

An as-built certification for stormwater BMPs must be provided to the <Insert Community Name> prior to final approval of the development. The certification should include the following:

A. A plan view of all detention basins, retention basins, and/or sediment forebays detailing the proposed and final as-built elevation contours. Sufficient spot elevations should be provided on each side of the basin, the bottom of the basin, and along the emergency spillway(s).

B. Detention basin, retention basin, and/or sediment forebay calculations along with corresponding volumes associated with the as-built elevations. The proposed volume and final as-built volume should be indicated.

C. Final as-built invert elevations for all inlet pipes and all associated outlet structure elevations, riser pipe hole sizes, and number of holes should be included. Invert elevations of the final outlet pipe to the receiving water and elevation of the final overflow structure should also be provided.

D. The side slopes of all stormwater basins should be identified and must meet minimum safety requirements.

E. The certification should be signed and sealed by a registered professional engineer or landscape architect.

ARTICLE VI. ENGINEERED SITE GRADING PLANS

Section 6.01 Contents of Engineered Site Grading Plans

A. Five copies of Engineered Site Grading Plans for a development shall be submitted by the proprietor to the <Insert Community Name>; provided, however, if and to the extent the same information has been previously submitted as required under a separate ordinance requirement, then, the applicant shall provide copies of the previous submission, together with new information required hereunder which has not been previously submitted.

B. The Engineered Site Grading Plan shall include the following information subject to the exception specified in sub-paragraph A, above:

1. A plan showing the layout of the area intended to be developed will be submitted by the applicant or their representative. This plan will be prepared under the direction of, and sealed by, a registered professional engineer or a registered land surveyor, and shall fit on a sheet of paper that does not exceed 24" by 36", drawn to a standard engineering scale not less than 1" = 50'.
2. The legal property description and a north indicator.
3. Existing grades on a 50-foot grid to a minimum of 50 feet beyond the site property line and sufficient

intermediate grades to determine such things as ditches, swales, adjacent pavement, buildings, and other pertinent features.

4. Location of any watercourses, wetlands, woodlands, environmental feature setback areas (as specified in the Zoning Ordinance), lakes, and ponds on the site.
5. Existing easements.
6. Existing utilities, manholes, and culverts.
7. Road rights-of-way, existing and proposed.
8. Proposed topography of the site.
9. Location and description of any existing and proposed stormwater management and soil erosion control measures.
10. Flow direction(s) of stormwater runoff onto and from the site before and after development, including the direction of overland flow.
11. Proposed elevations shall be underlined or boxed in to differentiate from existing elevations. It is expected that all elevations shall be in hundredths of a foot.
12. A location map.
13. The general stormwater management scheme for the proposed development indicating how stormwater management will be provided and where drainage will outlet.
14. A description of the off-site outlet and evidence of its adequacy. If no adequate watercourse exists to effectively handle a concentrated flow of water from the proposed development, discharge will be reduced to sheet flow prior to exiting the site, and cannot exceed the allowable outlet rate defined in the Engineering Design Standards. Additional volume controls may be required in such cases and/or acquisition of rights-of-way from downstream property owners receiving the stormwater flow.
15. Any on-site and/or off-site stormwater management facilities and appropriate easements, dedicated to the entity that will be responsible for future maintenance.
16. Any drainage originating outside of the development limits that flows onto or across the development. (In general, drainage from off-site shall not be passed through on-site stormwater BMPs).
17. Any natural watercourses and county drains that traverse or abut the property.

Section 6.02 Review Procedures and Standards

The following standards shall be met by applicant:

A. The increased volume of water discharged from a development shall not create adverse impacts to downstream property owners, wetlands and watercourses (e.g., flooding; excessive soil saturation; crop damage; erosion; degradation in water quality or habitat).

B. Natural topography and site drainage shall be preserved and site grading shall be minimized to the maximum extent reasonably achievable considering the nature of the development.

C. Watercourses shall not be deepened, widened, dredged, cleared of vegetation, straightened, stabilized, or otherwise altered without applicable permits or approvals from the <Insert Community Name>, relevant county agencies and the applicable State of Michigan Department(s).

The following review procedures shall be in place:

A. Engineered Site Grading Plans shall be subject to review and approval by the <Insert Community Official>or his/her designee(s) to assure compliance with this Ordinance.

B. Engineered Site Grading Plans shall be reviewed and approved by the <Insert Community Official>or his/her designee prior to the issuance of a building permit.

C. Construction Plans shall be reviewed by the <Insert Community Name> Engineering Consultant, Environmental Consultant and Building Department to ensure that the construction plan conforms with the approved Stormwater Plan.

ARTICLE VII. PERFORMANCE GUARANTEES, EASEMENTS, AND MAINTENANCE

Section 7.01 Applicability of Requirements

Requirements of this Article concerning performance guarantees, easements, and maintenance agreements shall apply to proprietors required to submit a Stormwater Plan to the <Insert Community Name> for review and approval.

Section 7.02 Performance Guarantees

The applicant shall post an acceptable form of an irrevocable letter of credit. The performance guarantee shall be an amount determined by the <Insert Community Name>. Required performance guarantees shall be provided to the <Insert Community Name> after Stormwater Plan, but prior to the initiation of any earth change.

After determination by the <Insert Title> or his/her designee for site plans, or by the <Insert County> County Drain Commissioner for site condominiums and subdivisions, that all facilities are completed in compliance with the approved Plan, the posted performance guarantee remaining shall be released.

Section 7.03 Stormwater Management Easements

A. Necessity of Easements

Stormwater management easements shall be provided in a form required by the applicable approving body of the <Insert Community Name> and the <Insert Community Name> Attorney, and recorded as directed as part of the approval of the applicable <Insert Community Name> body to assure (1) access for inspections; (2) access to stormwater BMPs for maintenance purposes; and (3) preservation of primary and secondary drainageways which are needed to serve stormwater management needs of other properties.

B. Easements for Off-site Stormwater BMPs

The proprietor shall obtain easements assuring access to all areas used for off-site stormwater management, including undeveloped or undisturbed lands.

C. Recording of Easements

Easements shall be recorded with the <Insert County> County Register of Deeds according to county requirements.

D. Recording Prior to Building Permit Issuance

The applicant must provide the <Insert Community Name> Clerk with evidence of the recording of the easement prior to final subdivision plat or condominium approval or other applicable final construction approval.

Section 7.04 Maintenance Bond

A. A maintenance bond shall be provided to the <Insert Community Name>.

B. The maintenance bond shall be provided for a period of two years commencing from the date of final approval of the Stormwater Plan.

Section 7.05 Maintenance Agreement

A. Purpose of Maintenance Agreement

The purpose of the maintenance agreement is to provide the means and assurance that maintenance of stormwater BMPs shall be undertaken.

B. Maintenance Agreement Required

1. A maintenance agreement shall be submitted to the <Insert Community Name>, for review by the <Insert title> and his/her designee and <Insert Community Name> Attorney, for all development, and shall be subject to approval in accordance with Stormwater Plan. A formal maintenance plan shall be included in the maintenance agreement.
2. Maintenance agreements shall be approved by the <Insert Community Name> Board/Council prior to final subdivision plat or condominium approval, as applicable, and prior to construction approval in other cases.
3. A maintenance agreement is not required to be submitted to the <Insert Community Name> for Chapter 18 Drains that will be maintained by the <Insert County> County Drain Commission.

C. Maintenance Agreement Provisions

1. The maintenance agreement shall include a plan for routine, emergency, and long-term maintenance of all stormwater BMPs, with a detailed annual estimated budget for the initial three years, and a clear statement that only future maintenance activities in accordance with the maintenance agreement plan shall be permitted without the necessity of securing new permits. Written notice of the intent to proceed with maintenance shall be provided by the party responsible for maintenance to the <Insert Community Name> at least 14 days in advance of commencing work.
2. The maintenance agreement shall be binding on all subsequent owners of land served by the stormwater BMPs and shall be recorded in the office of the <Insert County> County Register of Deeds prior to the effectiveness of the approval of the <Insert Community Name> Board/Council.
3. If it has been found by the <Insert Community Name> Board/Council, following notice and an opportunity to be heard by the property owner, that there has been a material failure or refusal to undertake maintenance as required under this ordinance and/or as required in the approved maintenance agreement as required hereunder, the <Insert Community Name> shall then be authorized, but not required, to hire an entity with qualifications and experience in the subject matter to undertake the monitoring and maintenance as so required, in which event the property owner shall be obligated to advance or reimburse payment (as determined by the <Insert Community Name>) for all costs and expenses associated with such monitoring and maintenance, together with a reasonable administrative fee. The maintenance agreement required under this Ordinance shall contain a provision spelling out this requirement and, if the applicant objects in any respect to such provision or the underlying rights and obligations, such objection shall be resolved prior to the commencement of construction of the proposed development on the property.

ARTICLE VIII SEVERABILITY

Section 8.01 Severability

If any section, clause, provision or portion of this Ordinance is adjudged unconstitutional or invalid by a court of competent jurisdiction, the remainder of this Ordinance shall remain in force and effect.

ARTICLE IX ENFORCEMENT

Section 9.01 Sanctions for Violations

A. Any person violating any provision of this ordinance shall be responsible for a municipal civil infraction and subject to a fine of not less than $_____ for a first offense, and not less than $ _____ for a subsequent offense, plus costs, damages, expenses, and other sanctions as authorized under Chapter 87 of the Revised Judicature Act of 1961 and other applicable laws, including, without limitation, equitable relief; provided, however, that the violation stated in Section 6.01(2) shall be a misdemeanor. Each day such violation occurs or continues shall be deemed a separate offense and shall make the violator liable for the imposition of a

fine for each day. The rights and remedies provided for in this section are cumulative and in addition to any other remedies provided by law. An admission or determination of responsibility shall not exempt the offender from compliance with the requirements of this ordinance.

For purposes of this section, "subsequent offense" means a violation of the provisions of this ordinance committed by the same person within 12 months of a previous violation of the same provision of this ordinance for which said person admitted responsibility or was adjudicated to be responsible.

The <Insert Community Name> [zoning administrator, building inspector, enforcement officer, etc.] is authorized to issue municipal civil infraction citations to any person alleged to be violating any provision of this Ordinance.

B. Any person who neglects or fails to comply with a stop work order issued under Section 6.02 shall, upon conviction, be guilty of a misdemeanor, punishable by a fine of not more than $500 or imprisonment in the county jail for not more than 93 days, or both such fine and imprisonment, and such person shall also pay such costs as may be imposed in the discretion of the court.

C. Any person who aids or abets a person in a violation of this ordinance shall be subject to the sanctions provided in this section.

Section 9.02 Stop Work Order

Where there is work in progress that causes or constitutes in whole or in part, a violation of any provision of this Ordinance, the <Insert Community Name> is authorized to issue a Stop Work Order so as to prevent further or continuing violations or adverse effects. All persons to whom the stop work order is directed, or who are involved in any way with the work or matter described in the stop work order shall fully and promptly comply therewith. The <Insert Community Name> may also undertake or cause to be undertaken, any necessary or advisable protective measures so as to prevent violations of this ordinance or to avoid or reduce the effects of noncompliance herewith. The cost of any such protective measures shall be the responsibility of the owner of the property upon which the work is being done and the responsibility of any person carrying out or participating in the work, and such cost shall be a lien upon the property.

Section 9.03 Failure to Comply; Completion

In addition to any other remedies, should any owner fail to comply with the provisions of this Ordinance, the <Insert Community Name> may, after the giving of reasonable notice and opportunity for compliance, have the necessary work done, and the owner shall be obligated to promptly reimburse the <Insert Community Name> for all costs of such work.

Section 9.04 Emergency Measures

When emergency measures are necessary to moderate a nuisance, to protect public safety, health and welfare, and/or to prevent loss of life, injury or damage to property, the <Insert Community Name> is authorized to carry out or arrange for all such emergency measures. Property owners shall be responsible for the cost of such measures made necessary as a result of a violation of this Ordinance, and shall promptly reimburse the <Insert Community Name> for all of such costs.

Section 9.05 Cost Recovery for Damage to Storm Drain System

A discharger shall be liable for all costs incurred by the <Insert Community Name> as the result of causing a discharge that produces a deposit or obstruction, or causes damage to, or impairs a storm drain, or violates any of the provisions of this Ordinance. Costs include, but are not limited to, those penalties levied by the Environmental Protection Agency or Michigan Department of Environmental Quality for violation of an NPDES permit, attorney fees, and other costs and expenses.

Section 9.06 Collection of Costs; Lien

Costs incurred by the <Insert Community Name> and the Drain Commissioner pursuant to Sections 6.02, 6.03, 6.04 and 6.05 shall be a lien on the premises which shall be enforceable in accordance with Act No. 94 of the Public Acts of 1933, as amended from time to time. Any such charges which are delinquent for six (6) months or more may be certified annually to the <Insert Community Name> Treasurer who shall enter the lien on the next tax roll against the premises and the costs shall be collected and the lien shall be enforced in the same manner as provided for in the collection of taxes assessed upon the roll and the enforcement of a lien for taxes. In addition to any other lawful enforcement methods, the <Insert Community Name> or the Drain Commissioner shall have all remedies authorized by Act No. 94 of the Public Acts of 1933, as amended.

Section 9.07 Effect of Approval on Remedies

The approval or disapproval of any Stormwater Plan shall not have any effect on any remedy of any person at law or in equity.