

APPENDIX D: TOOLS AND TECHNIQUES FOR PROTECTION OF THE STONY/PAINT CREEK CORRIDORS

Introduction

As described in Chapter 4 of the Stony/Paint Creek Subwatershed Management Plan, the following material describes potential tools that could be used to improve protection of Stony & Paint Creeks and its water quality. It describes planning tools that work to improve water resource protection, as well as provides some example language for goals, policies and guidelines.

To help communities incorporate these ideas into their existing planning documents, the tools have been organized into three main categories:

- Master Plan
- Zoning and other ordinances
- Standards, guidelines, and overlay districts

The recommendations presented here are organized in the same way as the evaluations are organized: Plans and Policies, Development/Redevelopment Regulations, and Design Standards. This organization was used to enable easy integration of the recommendations into each document. It also allows the community to see how the recommendations could be combined, and how they might impact each other as well as existing policies and/or regulations.

Model language for some recommendations is also provided. This language is intended to be a sample that can guide the community's work in customizing it to best fit into their existing goals, plans and regulations. They do not provide a legal opinion and should not be relied upon for a complete description of required language.

Plans and Policies

The most influential tools that a community has for protecting water resources are its plans and policies. These documents lay out a community's future vision of the character of its landscapes, the goals of its citizens, and the policies it has adopted to achieve this vision.

This section discusses a few options available for communities to create a policy basis for planning decisions that can help to protect water resources. It describes information that can be added to the community's Master Plan or be stand-alone plans themselves. Regardless of how the information is organized, this section provides guidance to the ideas that could be included in a planning document that communicates a community's vision for the future of its water resources.

As part of this discussion, we have provided sample language that communities can use as a basis for developing goals, policies and ordinances. ***We strongly recommend that any sample language used in this way be carefully considered and modified as necessary so that it is consistent with and compliments goals, policies and requirements in the community's current documents.***

Master Plan as a Basis

Planning is a process that involves the conscious selection of policy choices to guide land use, growth, and development in the community. The Master Plan is the official document that sets forth policies to guide future land use and development of the community.

The Plan serves many functions and is to be used in a variety of ways:

- 1) The Plan is a general state of the community's goals and policies and provides a single, comprehensive view of the community's desires for the future.
- 2) The Plan serves as an aid in daily decision-making. The goals and policies outlined in the Plan guide the Planning Commission and elected officials in their deliberations on zoning, subdivision, capital improvements and other matters relating to land use and development.

The policy orientation of this Plan provides decision-makers with a framework and basis for decisions while recognizing the dynamic character of the community. The variables upon which this Plan is based will likely change over time. However, adherence to the goals and policies will provide a stable, long-term basis for decision-making.

- 3) The Plan provides the statutory basis upon which zoning decisions are based. Both the Township Rural Zoning Act (P.A. 184 of 1943, as amended), and the City and Village Zoning Act (P.A. 207 of 1921) require that the zoning ordinance be based upon a plan designed to promote the public health, safety, and general welfare.
- 4) The Plan is an educational tool and gives citizens, property owners, developers, and adjacent communities a clear indication of the community's direction for the future.

In summation, the Master Land Use Plan is the only officially adopted document that sets forth an agenda for the achievement of goals and policies for the entire community. It is a long-range statement of general goals and policies aimed at the unified and coordinated development of the community. As such, it provides the basis upon which zoning and land use decisions are made.

A community's Master Plan sets out to establish the basis for protection of water resources and justification for the direction of the ordinances adopted to achieve both natural feature preservation and ecologically-aware development. Both the Municipal Planning Act (P.A. 285 of 1931) and the Township Planning Act (P.A. 168 of 1959) give broad authority for the consideration of natural resource protection and development rules and guidelines in the formulation of the Plan. One tool that can be incorporated into the Master Plan to achieve these goals is a Natural Areas Plan.

1) Natural Areas Plan

The purpose of a Natural Areas Plan is to identify environmentally significant areas of the community that should be preserved in their natural state and those that can be compatibly integrated with development. Furthermore, the Natural Areas Plan can work toward creating a system of open spaces that are linked to one another through naturally-occurring or human-made corridors. It can be included as a Chapter of the Master Plan, or can be a stand-alone plan. If stand-alone, the natural features inventory and background data should be included as part of the plan.

The Natural Areas Plan represents an ecosystem approach to open space planning that will help preserve both the natural areas themselves, but also the *functioning* of the systems these areas represent. It is an "ecosystem" approach to land preservation, which takes into account not only the natural feature identified as significant, but also the other adjacent land elements that allow that natural feature to be sustained.

Development of the Plan

A Natural Areas Plan can be developed using the following steps:

Step 1: Combining the Data.

Available natural features data is combined on a map that identifies important natural and human-made features. This data can include:

- a) Any natural feature inventories conducted for parcels within the community, such as wetlands, woodlands, high quality wildlife habitat, etc.
- b) Wetland Riparian Systems. This data includes rivers, streams, floodplains, lakes and wetlands. These landscape features are important because, with their plant and animal communities, they filter out pollutants and protect water quality for all the organisms that use surface waters and protect the physical health of citizens through clean groundwater.
- c) Upland Landscape Fabric. This data includes woodlands, tree rows and severe slopes. These elements offer an opportunity for establishing a network of natural landscape corridors linking patches, and larger natural areas establishing habitat corridors.

Linkages provide continuity between various areas of the landscape fabric, offering more and varied landscape types for wildlife.

- d) Publicly-Owned Properties and Recreational Lands. All publicly-owned recreational lands, including state, county, and locally-owned parcels are identified.
- e) Other Corridors. This data includes human-made corridors such as Natural Beauty Roads and utility corridors. Also included are existing and planned bicycle paths and trail systems.

Step 2: Analyzing the Data.

Once the data is combined on a map, it is possible to see where several data elements overlap, signifying the environmentally-important areas. Areas should be identified as “ecosystems,” or combinations of natural features that impact one another.

Step 3: Identifying Connections.

The next step is to connect the environmentally-significant sites to create an interrelated network of natural areas. The connecting corridors, such as rivers, existing tree rows, natural beauty roads, and utility lines, help preserve the natural functioning of these systems. If kept in their natural state, these corridors preserve the hydrologic connections between the river and its wetlands, between wetlands, and between adjacent uplands and wetlands. The corridors also provide spaces for wildlife to move between the natural areas and allow them to play their role in the functioning of the entire system.

Step 4: Prioritizing Areas and Identifying Protective Tools.

The last step in the process is to prioritize the natural areas based on their quality. This can be done by assessing the areas size, intactness (level of fragmentation), riparian corridor, wetlands, restorability, and known occurrence of rare plant communities or species. Some of this information, such as “restorability” and “rare plant communities or species” can be assessed on a case-by-case basis as land is being developed through the site plan review process.

Another method of prioritizing areas is to assess the role they play in surface and groundwater storage and filtering, habitat, community character, or other values that the community places on its natural resources. Once areas are prioritized, their fitness for development can be assessed, and tools can be identified to protect natural features, restore degraded features, and guide development.

Example tools:

- *Preserve open space through fee simple purchase and/or conservation easements.*
- *Continue to use land conservation and clustering tools to preserve existing natural features and their functioning.*
- *Protect non-regulated wetlands from development and water quality degradation. Best management practices should be implemented for the capture and filtering of storm water and storm water infiltration to treat water before it reaches any existing wetland.*
- *Use low impact road crossing techniques to protect the riparian corridor and existing hydrology of rivers and streams.*

2) Storm Water Master Plan

A comprehensive Storm Water Master Plan addresses development, implementation, and enforcement of controls to protect designated uses in all receiving waters. It requires the development of ordinances or other regulatory measures to address post-construction storm water runoff from new development and re-development projects. Tools that would be included are:

- 1) Ordinances or other mechanisms that will regulate storm water runoff from developed sites. This ordinance should address storm water quality, and limit the rate of runoff to pre-development rates.
- 2) Requirements for the use of structural and non-structural Best Management Practices (BMPs).
- 3) Requirements for the long-term maintenance of BMPs.
- 4) Site plan review requirements for storm water management facilities.
- 5) Requirements that will minimize illicit discharges and spills into the community's storm water system by commercial operations.

In addition to appropriate tools, the Storm Water Master Plan will also include measurable goals that could be accomplished by using BMPs, such as reduction in pollutant levels.

3) Greenway Plan

A Greenway Plan can achieve several purposes: natural features preservation, facilities for alternate modes of transportation, and recreation opportunities. Greenway Plans are particularly relevant to water resource protection because of their linear character. Rivers and streams provide ideal corridors upon which to build a greenway.

As in most planning documents, a Greenway Plan requires goals and objectives. These principles guide the development of the plan, and assist in decision-making. Oftentimes, communities solicit public input on the development of a Greenway Plan, which helps to identify corridors, destinations, and points of interest along the way.

Example goals and objectives:

Goal: Develop a greenway system that helps protect cultural and sensitive environmental areas.

Objective: Acquire property or conservation easements (or the like) along environmentally-sensitive corridors such as rivers, streams, wetlands, woodlands, and wildlife habitat corridors to protect and integrate these areas as part of the greenway system.

Goal: Develop the greenway system through cooperation and coordination with private land owners, land conservancies, developers, recreation and environmental groups, and other public agencies.

Objective: Build on existing relationships between the community and public and private groups to plan, finance, and implement the greenway system.

Other important goals would discuss the approach to funding and maintaining the greenway trail.

Development of the Plan

A Greenway Plan can be created by combining layers of information about the community, its natural resources, and cultural assets.

Step 1: Determine Greenway Elements.

Determine the important destinations within the community that should be connected by a non-motorized path system. These elements could include existing parks, schools, and historic and cultural points of interest.

Step 2: Determine Natural Features.

Identify natural features that should be preserved, particularly natural river and stream corridors.

Step 3: Determine Human-Made Features.

Identify human-made corridors such as roads, abandoned railroad rights-of-way, tree-rows, Natural Beauty Roads, and utility line corridors. Other amenities to identify are existing and planned trail systems offered through other state, county or local agencies.

Step 4: Create and Map the Greenway

When all this information is combined on a map, the potential routes and destinations present themselves by the pattern of overlapping data. The actual trail and points of interest can be considered and finalized, culminating in a Greenway Plan Map.

It is important to connect your community's greenway with trails that travel through other communities. This will significantly increase the value of the greenway for alternative transportation and recreation purposes. For example, the "Greenways Initiative" has developed a concept greenway plan for Southeast Michigan. This large-scale plan connects the seven counties of the region, and was developed by working with residents in these counties to connect 4.5 million people through the non-motorized path system.

A Greenway Plan can be a stand-alone document, or can be a chapter in the community's Recreation Master Plan. If a stand-alone document, descriptions of the community's relevant features, such as streams and rivers, other natural resources and cultural destination points, needs to be included as background information for the Greenway Plan itself.

Development/Redevelopment Regulations:

Zoning and Other Ordinances

Other effective tools a community possess are their ordinances. These local laws can provide detailed direction on the approach a community wants a landowner to take in developing or redeveloping land. Ordinances can provide standards that address natural features and their preservation and help the land developer, and the public servants reviewing the site plans, design and assess a site's potential for development and protection of water resources.

1) Storm Water Management Ordinance

A Storm Water Management Ordinance can be used to communicate to developers how storm water quality and quantity are viewed by the community, and can give them guidance to how they should approach storm water management on site through their designs. Storm water runoff is one of the major sources of pollution degrading our water resources. This is due, in part, because we have become very efficient at collecting runoff, and carrying it off site through underground pipes. These pipes, however, do not filter the storm water of pollutants before it reaches a stream or wetland.

Therefore, the main emphasis of a Storm Water Management Ordinance should be to prevent storm water runoff, and treat the runoff that does occur before it reaches a natural water body. (Please see the next section, "Impervious Surface Reduction/Infiltration Enhancement Ordinance," for more information and sample language on preventing storm water runoff.)

General standards to include in a Storm Water Management Ordinance are topics such as:

- Encourage open space design subdivisions that use smaller lot sizes. This minimizes impervious surface by clustering developing in one area of the site, reducing total construction costs (shorter roads, utilities), and provides recreational space. The open space allows storm water to infiltrate into the ground, filtering out pollutants and recharging groundwater.
- Limiting land disturbance and grading.
- Maintaining the natural drainage patterns on site.
- Leave as much open space as possible in its natural condition. This provides storm water infiltration and has minimal maintenance costs.
- Link open space to existing wetlands, river systems, and other open space areas. This provides a buffer to these sensitive areas, allows scenic recreational opportunities for residents, provides a wildlife corridor, and could provide a location for non-motorized transportation (bicycles, roller bladers, hikers, walkers, etc.)

- Maintaining vegetated buffer strips other native vegetation along natural features to remain on site to improve infiltration of storm water.
- Minimizing impervious surfaces to reduce the amount of runoff and improve infiltration.
- Using Best Management Practices (BMPs) whenever possible. Using above-ground BMPs instead of below ground storm water conveyance systems (Please refer to the section titled “Best Management Practices” in this booklet for more information.) Above-ground BMPs include facilities such as vegetated swales planted with native species, terraces, contoured landscapes and runoff spreaders.
- Using infiltration devices.
- Require that soils be aerated/decompacted after construction is complete. The activity of heavy construction equipment can make soils almost as impervious as asphalt or concrete. Compacted soils reduce infiltration and can cause storm water management practices to be ineffective. In addition, storm water BMPs should be clearly labeled on grading plans and flagged in the field to ensure heavy construction equipment avoids these areas.

Other requirements in the ordinance should cover the use of wetlands, streams, rivers or other water bodies for storm water retention and/or conveyance. These standards would prohibit directly discharging storm water into a natural water body to the greatest extent possible and require that runoff be pre-treated to remove pollutants and sediments as well as slow the water’s velocity before it enters the water body.

Regulations for erosion control before, during and after construction could also be addressed in this ordinance. Other topics could include maintenance of the existing water body in its current state and function, private restrictions (i.e. through Master Deed and Bylaws) to insure that the water body is not disturbed in the future, and that all drainage systems are visually attractive with naturally contoured ponds planted with native plants.

Lastly, if some water bodies, such as wetlands, have been identified as high quality, the community may want to protect them more stringently. For example, a wooded wetland is particularly sensitive to hydrological changes, and discharging any storm water into it may dramatically change the plant mix from trees to a cattail marsh. Each community may want to single out particularly sensitive or high-quality water bodies and develop special standards for protecting these places.

An important element of the Storm Water Management ordinance is that it calls for regular inspection and maintenance of the storm water structures and facilities, and could require that the landowner enter into a maintenance agreement with the community to ensure these facilities are maintained for maximum efficiency.

2) Impervious Surface Reduction/Infiltration Enhancement Ordinance

Storm water runoff is one of the major sources of pollution degrading our water resources. This is due, in part, to the growing amount of impervious surfaces such as roads, parking lots, and buildings. Impervious surfaces add to the amount and rate of storm water entering our surface waters. This runoff carries a variety of pollutants such as fertilizers, pesticides, oil, bacteria from animal waste, and increased flow into the system. This results in degradation to our water resources, increases in the magnitude and frequency of flood events, reductions in fish and other aquatic species diversity, increases in stream bank erosion, and decreases in infiltration into the groundwater.

There are many ways to reduce the amount of impervious surfaces in a development. An Impervious Surface Ordinance could be used to communicate site development standards that guide developers and individuals doing site plan review to find opportunities for water infiltration. These standards can be included in a stand alone ordinance, as a set of site design standards, or included in other ordinances dealing with storm water or natural features/wetland protection. The following example language incorporates impervious surface reduction with language regulating storm water management.

Storm Water Management/Impervious Surface Mitigation Ordinance

1. *It is the intent of this Ordinance to encourage the use of structural, vegetative, or managerial practices, commonly referred to as best management practices (BMP's), designed to treat, prevent, or reduce degradation of water quality due to storm water runoff. All development projects subject to review under the requirements of this Ordinance shall be designed, constructed, and maintained using best management practices (BMP's) to prevent flooding, protect water quality, reduce soil erosion, maintain and improve wildlife habitat, and contribute to the aesthetic values of the project. The particular facilities and measures required on-site shall reflect and incorporate existing grade, natural features, wetlands, and watercourses on the site to the maximum extent feasible.*
2. *Storm Water Drainage/Erosion Control. All storm water drainage and erosion control plans shall meet the standards adopted by the Community for design and construction and shall, to the maximum extent feasible, utilize nonstructural control techniques, including but not limited to:*
 - a. *limitation of land disturbance and grading;*
 - b. *maintenance of vegetated buffers and natural vegetation;*
 - c. *minimization of impervious surfaces;*
 - d. *use of terraces, contoured landscapes, runoff spreaders, grass or rock-lined swales;*
 - e. *use of infiltration devices.*
3. *General Standards.*

- a. *Storm water management systems shall be designed to prevent flooding and the degradation of water quality related to storm water runoff and soil erosion from proposed development.*
 - b. *All properties which are subject to this ordinance shall provide for on-site storage of storm water. Facilities shall be designed to provide a volume of storage and discharge rate which meets the standards of the community.*
 - c. *Priority shall be placed on site design which maintains natural drainage patterns and watercourses. Alterations to natural drainage patterns shall not create flooding or degradation in water quality for adjacent or downstream property owners.*
 - d. *The use of swales and buffer strips vegetated with desirable native materials is encouraged as a method of storm water conveyance so as to decrease runoff velocity, allow for biofiltration, allow suspended sediment particles to settle, and to remove pollutants. Tolerance for water saturation, sunlight, pesticides, metals, and salts shall be required in determining appropriate plantings in these areas.*
 - e. *Drainage systems shall be designed to be visually attractive. The integration of storm water conveyance systems and retention and detention ponds in the overall landscape concept is recommended. Ponds with a naturally contoured, rather than square or rectangular, design and appearance shall be encouraged.*
 - f. *Where large amounts of grease and oil may accumulate, as in the case of commercial/industrial developments and large areas of impervious surfaces for parking, oil separators shall be required.*
 - g. *For sites that store or use chemicals, a spill response plan shall be submitted and approved by the community.*
4. *Use of Wetlands. Wetlands may be used for storm water management if all the following conditions are met:*
- a. *Wetlands shall be protected from impairment due to the discharges of storm water. Measures shall be taken reduce erosive velocities of storm water and to remove sediment and other pollutants prior to discharge to a wetland.*
 - b. *Wildlife, fish or other beneficial aquatic organisms and their habitat within the wetland will not be impaired*
 - c. *The wetland has sufficient holding capacity for storm water, based upon calculations prepared by the proprietor and reviewed and approved by the community.*
 - d. *On-site erosion control shall be provided to protect the natural functioning of the wetland.*
 - e. *Provisions approved by the community shall be established so as to insure that the wetland is not disturbed or impaired in the future relative to the needed storage capacity.*

f. *Applicable permits from the Michigan Department of Environmental Quality are obtained.*

5. *Impervious Surface Reduction/Infiltration Enhancement. The community recognizes that, due to the specific requirements of any given development, inflexible application of the design standards may result in development with excessive paving and storm water runoff and a waste of space which could be left as open space.*

Either through procedures prescribed by Ordinance or creative land development techniques permitted by Ordinance, the community may permit deviations from requirements allowing for reduction in impervious surfaces whenever it finds that such deviations are more likely to meet the intent and standards of this Ordinance and accommodate the specific characteristics of the use in question.

The community may attach conditions to the approval of a deviation that bind such approval to the specific use in question. Measures that reduce impervious surface and increase infiltration may include, but are not limited to, the following:

a. *Streets and Access.*

- (1) Design residential streets with the minimum required pavement width needed to support travel lanes, on-street parking, and emergency, maintenance, and service vehicle access and function based on traffic volumes.*
- (2) Reduce the total length of residential streets by examining alternative street layouts to determine the best option for increasing the number of homes per unit length.*
- (3) Design street right-of-way widths/private road easements to reflect the minimum required to accommodate the travel-way, the sidewalk, and vegetated open channels.*
- (4) Minimize the number of street cul-de-sacs and reduce the radius of cul-de-sacs to the minimum required to accommodate emergency and maintenance vehicles. Alternative turnarounds shall be considered, including the use of mountable curbing and grass shoulders for the occasional event of access by fire trucks and other large commercial trucks. Where cul-de-sacs do exist, provide landscape center islands.*
- (5) Where density, topography, soils, and slope permit, use vegetated open channels in the street right-of-way/private road easements to convey and treat storm water runoff.*
- (6) Use alternative driveway surfaces and shared driveways that connect two or more sites.*
- (7) Promote more flexible design standards for residential subdivision sidewalks. Where practical, consider locating sidewalks on only one side of the street and providing common walkways linking pedestrian areas.*

b. *Parking*

- (1) *Base parking requirements on the specific characteristics of the use, landbanking in open space parking required to satisfy Ordinance requirements.*
- (2) *Reduce the overall imperviousness associated with parking lots by providing compact car spaces, minimizing stall dimensions, incorporating efficient parking lanes, and using pervious materials in the spillover parking areas where possible.*
- (3) *Encourage shared parking between compatible users.*

c. Site Design

- (1) *Direct rooftop runoff to pervious areas such as yards, open channels, or vegetated areas and avoid routing rooftop runoff to the roadway and the storm water conveyance system.*
 - (2) *Create a naturally vegetated buffer system which may vary in width as determined by the community along all drainage ways. Critical environmental features such as the 100-year floodplain, steep slopes, and wetlands shall be considered.*
 - (3) *Minimize clearing and grading of woodlands and native vegetation to the minimum amount needed to build lots, allow access, and provide fire protection.*
 - (4) *Conserve trees and other vegetation at each site by planting additional vegetation, clustering tree areas, and promoting the use of native plants.*
6. *Maintenance. Whenever a landowner is required to provide on site storm water retention and/or surface drainage to a wetland, or whenever other protective environmental measures including monitoring devices are required, such measures or facilities shall be provided and maintained at the landowner's expense. The landowner shall provide assurance to the Community by written agreement that the landowner will bear the responsibility for providing and maintaining such methods or facilities. A maintenance plan shall be provided including notation and description of maintenance requirements and timelines.*

3) Wetland Protection Ordinance

Federal and state wetland regulations generally protect wetland areas of more than five acres and wetlands of any size that are contiguous with other water bodies, such as rivers and lakes. Local wetland regulations can build on these laws and provide protection for smaller, or isolated wetlands that could otherwise be threatened by development. It is important that before adopting any wetlands ordinance, a community work with the Michigan Department of Environmental Quality (MDEQ) to ensure that the new ordinance coordinates with the state and federal regulations.

Basic Wetland Ordinance Components

There are generally six basic components to a wetlands ordinance:

- 1) **A statement of wetland protection goals** that validate wetland regulations as a way to carry out mandated state statutes, such as controlling water pollution or reducing flooding. Ties between wetland protection and protecting citizens' health, safety and general welfare should also be made by stating the values that wetlands bring each community and the problems that can arise if wetlands are not properly protected.
- 2) **A definition of a wetland.** Michigan's wetland protection laws require that local governments define wetlands in the same way as they are defined under the state statute.
- 3) **Wetland inventory map.** Communities must adopt a wetlands map that inventories wetlands throughout the community. This map, used in conjunction with aerial photographs and field inventories on a case-by-case basis, are used to administer the wetland ordinance.
- 4) **Permitted uses, prohibited uses, standards for protection and use.** A list of prohibited and permitted uses and performance standards. Many of these items are listed within the state statute.
- 5) **Permit application, review and administration.** If a community has a wetland's ordinance, they become responsible for reviewing and issuing permits for wetlands covered by the ordinance. The local unit of government is responsible for keeping MDEQ informed of wetland permit applications and the results of a wetland permit application review.

Penalties. Most ordinances include penalties for violations of the wetlands ordinance. Penalties can include fines and/or a requirement that the affected wetland area be restored or mitigated in some way.

- 6) Lastly, **enforcement is the key to wetland protection.** Field inspections need to be made to ensure wetlands are properly protected during construction and, if a mitigation project, that the new wetland is functioning properly. Field visits to confirm that required actions have been taken will also help monitor wetlands over time, providing the community with information that indicates whether the wetland's ability to function is improving, getting worse or being maintained.

4) Natural Features Setback Ordinance

A natural features setback establishes a minimum setback from natural features to prevent physical harm or destruction of the feature. This ordinance recognizes the relationship that adjacent ecosystem types have to one another. An example ordinance follows this description.

The natural features setback creates a naturally vegetated strip of land adjacent to the natural feature that is left intact during and after construction. The size of the vegetated strip is up to the community, but should be a minimum of 25 feet wide.

Because there is broad authority in the Zoning Enabling legislation for natural feature protection, this ordinance would be a provision of the Zoning Ordinance.

Example Natural Features Setback Ordinance

The language utilized below presumes that a separate article of the zoning ordinance would be adopted. Modifications would be required for application in a separate ordinance.

1. Intent

It is the intent of this article to require a minimum setback from natural features [Note: If the community defines "natural feature" in its ordinance for other purposes, a different term should be considered for purposes of this regulation.], and to regulate property within such setback in order to prevent physical harm, impairment and/or destruction of or to a natural feature. It has been determined that, in the absence of such a minimum setback, intrusions in or on to natural features would occur, resulting in harm, impairment and/or destruction of natural features contrary to the public health, safety and general welfare. This regulation is based on the police power, for the protection of the public health, safety and welfare, including the authority granted in the _____ Zoning Enabling Act.

2. Regulation

A natural feature setback shall be maintained in relation to all areas defined in this ordinance as being a "natural feature," unless, and to the extent, it is determined to be in the public interest not to maintain such a setback.

3. Definition of "Natural Feature"

A "natural feature" shall mean a wetland, and shall mean a watercourse. [Note: The definition may be expanded to include floodplain, fragile land (as identified, defined and/or mapped), geologic feature (as identified, defined and/or mapped), steep slopes, areas of highly erodible or highly permeable soils, woodlands, or other appropriate feature.

4. Authorization and Prohibition

(a) The natural feature setback shall be an area or feature with boundaries and limitations determined in accordance with the standards and provisions in this article in relation to respective types of natural features.

- (b) *In conjunction with the review of plans submitted for authorization to develop property or otherwise undertake an operation in or on, or adjacent to, a natural feature, applicable natural feature setbacks shall be determined, and authorizations and prohibitions established, by the body undertaking the plan review.*
- (c) *Within an established natural feature setback, unless and only to the extent determined to be in the public interest by the body undertaking plan review, there shall be no: Deposit of any material, including structures; removal of any soils, minerals and/or vegetation; dredging, filling or land balancing; and/or constructing or undertaking seasonal or permanent operations. This prohibition shall not apply with regard to those activities exempted from this prohibition, below.*
- (d) *In determining whether proposed construction or operations are in the public interest, the benefit which would reasonably be expected to accrue from the proposal shall be balanced against the reasonably foreseeable detriments of the construction or other operation, taking into consideration the local, state and national concern for the protection and preservation of the natural feature in question. If, as a result of such a balancing, there remains a debatable question whether the proposed project and/or operation is clearly in the public interest, authorization for the construction and/or operation within the natural feature setback shall not be granted. The following general criteria shall be applied in undertaking this balancing test:*
- (1) The relative extent of the public and private need for the proposed activity.*
 - (2) The availability of feasible and prudent alternative locations and methods to accomplish the expected benefits from the activity.*
 - (3) The extent and permanence of the beneficial or detrimental effects which the proposed activity may have on the public and private use to which the area is suited, including the benefits the natural feature and/or natural feature setback provides.*
 - (4) The probable impact of the proposed construction and/or operation in relation to the cumulative effect created by other existing and anticipated activities in the natural feature to be protected.*
 - (5) The probable impact on recognized historic, cultural, scenic, ecological, or recreational values, and on fish, wildlife and the public health.*
 - (6) The size and quantity of the natural feature setback being considered.*
 - (7) The amount and quantity of the remaining natural feature setback.*

(8) Proximity of the proposed construction and/or operation in relation to the natural feature, taking into consideration the degree of slope, soil type and the nature of the natural feature to be protected.

(9) Economic value, both public and private, of the proposed construction and/or operation, and economic value, both public and private, if the proposed construction and/or operation were not permitted.

(10) The necessity for the proposed construction and/or operation.

5. Exemptions

If and to the extent the municipality is prohibited by its ordinance and/or law from regulating the proposed activity in or on the respective natural feature, regulation under this article shall be exempted.

6. Application Form

(APPLICATION FORM DEVELOPED BY COMMUNITY).

7. Setback Standards

Unless otherwise determined by the body undertaking the plan review, the following setbacks shall apply:

(a) *A 25* foot setback from the boundary or edge of a wetland, as defined and regulated in Ordinance No _____ [If the municipality does not have a wetlands ordinance, the following phrase may be inserted: "from a wetland, as defined by Act 203 of the Public Acts of 1979, as amended]. "*

(b) *A 25* foot setback from the ordinary high water mark of a watercourse, i.e., from a natural or artificial lake, pond or impoundment, river, stream or creek which may or may not be serving as a drain as defined by Act 40 of the Public Acts of 1956, as amended, or any other body of water which has definite banks, a bed and visible evidence of a continued flow or continued occurrence of water. [*Note: The use of a 25 foot standard in these provisions is not intended to alter the standard used or decided upon by any municipality.]*

[BELOW IS OPTIONAL FOR COMMUNITIES REGULATING OTHER NATURAL FEATURES]

A setback distance determined during plan review to be reasonably required in order to prevent probable and unreasonable physical intrusion in or on to a protected natural feature, taking into consideration degree of slope, soil type, the nature and type of activities anticipated to impact upon the natural feature, and the nature and type of the natural feature to be protected, provided, in all events, the setback shall not be greater than XX feet. For purposes of this provision, unreasonable physical intrusion shall be deemed to be a physical intrusion which would be damaging, impairing and/or undermining to the usefulness and/or function of the natural feature.

5) Tree/Woodlands Protection Ordinance

Tree preservation ordinances acknowledge that trees are an important community resource for both environmental and aesthetic reasons. Trees in wetlands and around other water bodies play an important role of taking up large amounts of water, thus aiding in flood control and nutrient absorption.

The goal of tree and woodlands preservation ordinances is to encourage creative design and construction techniques that will preserve as many trees, both as individuals and as woodland areas, as possible. This tool sets up a permit process if taking trees is unavoidable, a replacement scheme, a permit fee schedule, and penalties for illegally removing trees. It also identifies specific sizes for “Landmark Trees,” which are particularly large trees for the given species.

The following provide a general guideline to the development of such an ordinance:

- 1) **Conduct an assessment of the community’s tree and woodland resources.** This can be accomplished as a community project, or as properties are developed. The assessment should note the type and location of plant communities, including tree species and sizes, the presence of any unique ecosystems, and the location of large “landmark” trees.
- 2) **Establish priorities for preservation.** Once the assessment is completed, areas with significant trees or woodlands can be prioritized for preservation.
- 3) **Set goals for tree and woodland preservation.** This should address the different types of resources (such as woodland trees and understory plants, tree rows, landmark trees) that the community wants to preserve. Goals could include a maintenance program for existing trees, reducing tree loss during and after development, and providing for replacement trees.
- 4) **Provisions for pre-construction, on-site monitoring, and post-construction maintenance.** Ordinance requirements for pre-construction meetings to discuss tree protection, and on-site monitoring during construction ensure that existing trees are protected as planned. Post-construction monitoring also ensures that trees impacted by construction receive the appropriate care.
- 5) **Enforcement.** The ordinance should include an enforcement process with penalties for violations.

6) Private Road Ordinance

Growing communities experience a significant number of site plans that include construction of a roadway. If not carefully designed and built, roads can become a significant source of storm water pollution. One way to reduce the amount of clearing, grading and impervious surface in roadways is to allow for some flexibility in constructing them in residential developments. A private road ordinance can allow small developments to construct roadways in narrower road easements than public road regulations allow. This minimizes the amount of clearing required thus potentially preserving existing mature trees, reduces grading by allowing steeper grades and the ability to follow existing topography more closely, and allowing for less impervious surface through narrower pavement widths.

Problems with the maintenance of private roads have led many communities to prohibit them altogether. In some instances, residents of private roads petition to have the roadway become private to release them from the maintenance burden. This means either the City or the County (for Townships) has to accept these roads as part of their roadway network.

If a community decides to allow private roads, it should adopt standards that guide the design and construction of roads that will provide access for residents as well as emergency, delivery and maintenance vehicles. The April, 1997 issue of *Planning and Zoning News* suggests the following minimum standards be adopted in a separate private road ordinance, the zoning ordinance, or as a part of the land division ordinance:

- Right-of-way width (either 66 feet, or smaller. If smaller, the right-of-way is usually tied to the number of parcels served)
- Maximum road length ending in a cul-de-sac (usually 600 – 800 feet in urbanizing areas)
- Maximum number of parcels served on a private road with a single connection to a public road (usually 25 units).
- Circumstances under which the private road must be connected to other existing or proposed public or private roads.
- Clear vision area at intersections and driveways (usually at least 20 feet)
- Minimum turning radii in the cul-de-sac (usually tied to the needs of firefighting equipment and school buses)
- Subsurface materials and construction standards
- Drainage requirements
- Grade requirements and pavement slope standards
- Pavement type
- Shoulder width and surface requirements
- Requirements related to physical connections with public or other private roads
- Driveway width requirement for driveways created along the private road
- Engineering review requirements
- Inspection requirements
- Maintenance requirements (including recording with the Register of Deeds)

7) Parking Ordinance

Inflexible application of the requirements in a parking ordinance can generate a significant amount of storm water runoff through unnecessary and unused parking. Some ways to minimize or reduce impervious surfaces are discussed in the “Impervious Surface Reduction/Infiltration Enhancement Ordinance” section of this document. However, a community can also add language to their existing parking ordinance that will allow them more flexibility in applying the requirements they currently have.

In addition to the following language, provisions for allowing “banked” parking can also be included that will reserve room on a site for future parking if needed.

Example Language for Flexible Application of Parking Ordinance

Flexibility in Application. The community recognizes that, due to the specific requirements of any given development, inflexible application of the parking standards set forth in Section X may result in development with inadequate parking or parking far in excess of that which is needed. The former situation may lead to traffic congestion or unauthorized parking on adjacent streets of neighboring sites. The latter situation may result in excessive paving and storm water runoff and a waste of space which could be left as open space.

The body responsible for approving a site plan may permit deviations from the requirements of Section X and shall require more or less parking based upon a finding that such deviations are more likely to provide a sufficient number of parking spaces to accommodate the specific characteristics of the use in question.

The body responsible for approving a site plan may attach conditions to the approval of a deviation from the requirement of Section X that binds such approval to the specific use in question. Where a deviation results in a reduction of parking, the body responsible for approving a site plan may further impose conditions which ensure that adequate useable reserve area is set aside for future parking, if needed. Where area is set aside for reserve parking, it shall be easily developed, not devoted to a use other than open space, and shall be designed to accommodate attendant facilities such as maneuvering lanes and drainage.

A valuable resource to review current parking standards is the American Planners Association’s *Planner’s Advisory Report No. 432, “Off-Street Parking Requirements.”* The editor surveyed 127 Zoning Ordinances from communities around the country and compiled standards for more than 165 land uses.

8) Fertilizer Ordinance

Studies have shown that significant amounts of nutrients (phosphorus, nitrogen, and other chemicals) found in waterways come from fertilization practices by homeowners and other land managers. Communities have the ability to regulate the application of fertilizers within their jurisdiction as long as the regulations do not attempt to preempt requirements that are the responsibility of the Michigan Department of Agriculture (MDA). The MDA has the responsibility for regulating fertilizers to ensure that the product meets legal standards, that the labels accurately describe what is in the package, and that the manufacturers and distributors are licensed properly, among other activities. Farms generally cannot be regulated under a fertilizer ordinance unless they have proven adverse impacts to the environment or public health even with conformance with the Generally Accepted Agricultural Management Practices (GAAMPs).

At the local level, most communities have fertilizer ordinances that either regulate commercial applicators, local land owners, or both. It may be easier to only regulate commercial applicators at first, and then once educational activities can have some impact on citizens, implement an ordinance that also regulates land owners within the community.

The basic considerations and components of a fertilizer ordinance should include the following:

- First assess whether or not nutrients from fertilizers are a problem for waterways within your community.
- Determine if regulation is the appropriate mechanism to reduce nutrient inputs, or if other methods, such as public education, could be as effective.
- A fertilizer ordinance should address the following topics:
 - Licensing process for applicators in the community
 - Months of the year that fertilizers can be applied
 - Number of applications allowed per year
 - Allowable rate of application for phosphorous, nitrogen, and potassium. Language that helps applicators determine how many pounds of fertilizer for different sized lawns should be included.
 - Prohibit application of fertilizers within a certain distance from a waterbed wetland, or floodplain
 - Match fertilizer application with necessity through encouraging the use of soil testing by homeowners and commercial applicators.
 - Enforcement procedures and penalties for non-compliance
- Communities should include an educational component for residents and commercial applicators that explain the connection between fertilizer use, storm water runoff, and nutrient impacts on water bodies.

For communities with a significant agricultural industry, the following topics should also be considered in managing fertilizers:

- Develop a working relationship with the Michigan Department of Environmental Quality (MDEQ) and the MDA. These agencies assist farmers, through the Michigan Right to Farm Law, by developing Generally Accepted Agricultural Management Practices (GAAMPs), which if voluntarily followed, help to protect a farmer from nuisance lawsuits.
- There is an opportunity for communities to participate in the development of GAAMPs, and also a public input component to this process. The community should participate either of these for nutrient (fertilizer) use on farms, specifically commenting on

appropriateness of application rates, prohibitions on application during frost conditions, linking application rates to soil tests, and prohibiting application within a certain distance of water bodies, wetlands, or floodplains.

For a model fertilizer ordinance and more information about regulating fertilizer use in Michigan, please go to SEMCOG's website (www.SEMCOG.org), and type in "Fertilizer" in the "Search" box. This will get you to their publication *Managing Fertilizer to Protect our Water Resources*.

Design Standards:

Standards, Guidelines and Overlay Districts

In addition to modifications to the Master Plan and ordinances, there are other standards and tools that a community can adopt that promote and enhance stewardship of water resources. These tools focus on sustainable design and construction methods.

1) Best Management Practices (BMPs)

Communities should have policies and standards in place that encourage the use of Best Management Practices (BMPs) whenever possible to minimize, collect and treat storm water. Storm water BMPs consist of methods or a combination of methods that prevent or reduce water pollution generated from non-point sources. In general, BMP's can be structural, or they can be non-structural policies that help protect water resources. Structural BMPs are most often described in a community's Engineering Design Standards, which provides minimum standards on how each type of facility is to be built. BMPs should function together as a system to ensure that the volume, rate, timing, and pollutant load of runoff remains similar to that which occurred under natural conditions.

Structural Best Management Practices (BMPs)

Structural BMPs are physical means of accomplishing the above goals and can be divided into four categories:

- 1) **Detention structures.** Structures that "detain" water, and let it out slowly until the pond is dry.
- 2) **Retention structures.** Structures that "retain" water, holding it until it infiltrates into the ground or evaporates.
- 3) **Vegetated swales and strips.**
- 4) **Other practices** to reduce accumulated pollutants picked up by runoff, regulate the amount of impervious areas, and eliminate inappropriate discharges to drains and storm sewers.

Examples of various structural BMPs are listed below. Please note that some examples may fall under more than one category.

Detention Structures

- Detention Ponds
- Wet Ponds
- Storm water Wetlands
- Multiple Pond Systems

Retention Structures

- Wet Ponds
- Infiltration Trenches
- Infiltration Basins
- Storm water Wetlands
- Multiple Pond Systems
- Rain Gardens

Vegetated swales and strips

- Grassed Swales
- Filter Strips

Other practices

- Porous Pavement
- Grass Pavers
- Water Quality Inlets (e.g. Oil/Grit Separators)

Where each of these structural BMPs can be used is site specific and dependent on soil type, infiltration rate of soil, the level of the water table at the particular location, amount of sediment at the site, thermal impacts, space constraints, drainage area, and cost. Therefore, a particular BMP should be selected based on the water quality needs as well as cost, drainage area, land use, soil and topography. Consideration should also be given to addressing maintenance and inspection of BMPs to ensure that they are functioning properly.

Policy (Non-Structural) Best Management Practices (BMPs) Prevention and/or reduction of pollution generated from non-point sources can also be accomplished through the use of a community's policy BMPs, standards or programs. These tools can be described in the community's Property/Facilities Management Manual, Master Plan, and/or Zoning Ordinance. Examples of policy BMPs are as follows:

Storm water System Maintenance

- Street Sweeping
- Catch Basin Cleaning
- Outfall Inventory/Inspection
- Woody Debris Management
- Stream Bank Stabilization
- Floodplain/Wetland Management
- Household Hazardous Waste Disposal
- Equipment/Storage Area Maintenance

- Fertilizer Management

Site Development

- Cluster Housing
- Minimization of Street Parking
- Minimum/Maximum Parking Space Criteria
- Lot Coverage Requirements
- Open Space Requirements
- Require Use of Structural BMPs
- Enforce Soil Erosion and Sedimentation Control (SESC) Practices
- Development and Maintenance Agreements

Public Education /Outreach

- Display Boards
- Cable Programming
- Fliers/Brochures/Newsletters
- Public Meetings/Workshops
- Volunteer Opportunities
- Website
- River/Creek Signage

BMP Selection

Selecting the BMP for a site is an important step in meeting your community's storm water goals. The Center for Watershed Protection (CWP) has developed a Web site called Storm Water Manager's Resource Center (www.stormwatercenter.net) to assist communities in this process. CWP provides a series of matrices that can be used as a screening process for selecting the correct BMP for a development site. As selection of BMPs should be done on a site-by-site basis, these factors can be included in Engineering Design Standards to help assess proposed storm water BMPs. Screening factors include:

- Land use (practices best suited for the proposed land use at a site),
- Physical feasibility (physical constraints that may restrict or preclude a BMP),
- Climate/regional factors (regional characteristics that restrict or modify the use of certain BMPs),
- Watershed factors (which BMP helps meet watershed protection goals),
- Storm water management capability (which BMP or combination of BMPs are needed to meet storm water sizing criteria),
- Pollutant removal (how does each BMP compare in terms of pollutant removal), and
- Community and environmental factors (decide if the BMPs have any important community or environmental benefits or drawbacks that might influence the selection).

The table below lists BMPs to consider when implementing storm water management techniques.

Planning Criteria for Best Management Practices

BMP	Description	Function	Application
Extended Wet Detention Pond	Small constructed lake or basin with emergent wetland vegetation around the bank. Designed to detain runoff from storm events until it is displaced by subsequent events.	Reduction of storm water peak discharge. Removal of suspended solids. Removal of metals and nutrients.	Generally used for drainage areas in excess of five acres.
Extended Dry Detention Pond	A pond or basin that is usually dry between storms that captures runoff and releases it slowly enough to allow most sediment to settle. Less effective than wet retention pond at removing pollutants.	Reduction of storm water peak discharge. Removal of suspended solids.	Used for tributary watersheds 10 acres and larger to remove particulates.
Constructed Wetlands	Constructed basin with a significant percentage covered by wetland vegetation.	Reduction of storm water peak discharge. Removal of suspended solids. Removal of metals and nutrients. Removal of pathogens.	
Vegetated Swales	Channels or flat surfaces lined with vegetation that filters flow.	Removal of nutrients. Removal of suspended solids.	
Storm Water Filters	System that uses a filter medium (sand, gravel, peat or compost) or surface vegetation to remove a fraction of the polluting constituents in runoff. Limitations in cold climates because of freezing of medium. No affect on storm water flow attenuation.	Removal of nutrients. Removal of suspended solids. Removal of pesticides.	Used for reducing sediment, fertilizers, pesticides, etc. from drainage areas up to five acres with slopes up to two percent (e.g., along roads, around parking lots). Used mostly for particulate removal of runoff from large paved areas.
Oil and Grease Separators	A device that removes abnormally high concentrations of petroleum compounds, grease, and grit.	Removal of petroleum or grease. Removal of suspended solids.	At commercial/industrial facilities that generate high levels of oil products or grease. In medium to large parking or motor vehicle storage areas.

Source: *Planning and Cost Estimating Criteria for Best Management Practices*, Rouge River National Weather Demonstration Project, April 2001

BMP Combinations

Incorporating the use of several structural and/or policy BMPs can yield additional water quality benefits as opposed to simply relying on a single practice such as constructing a regional detention basin. Possible examples are as follows:

- Directing runoff from downspouts or parking lots to vegetative swales or grass filter strips instead of discharging directly to a stream
- Instituting a policy of regular storm water system maintenance, including street sweeping, cleaning catch basins, and detecting and eliminating inappropriate connections to storm drains (i.e. illicit discharges).
- Instituting and enforcing soil erosion policies, such as requiring a vegetated strip between cultivated land and a watercourse.
- Public education on the use and disposal of fertilizers, herbicides, and pesticides, including information regarding proper disposal.

2) Native Vegetation Guidelines

One goal of water resource protection is to develop and implement appropriate and effective tools to protect your community's natural resources. Important components of these natural resources are the plants that live within them. The plants that occur in your community naturally are very important because they uniquely perform environmental functions that keep our natural environment working. Plants native to Southeast Michigan clean our surface waters through absorption of pollutants and filtration of sediments, clean our air, provide familiar food sources to native wildlife, and are part of a sustainable system that is self-perpetuating within a scheme of checks and balances.

What are native plants? Native plants are the trees, shrubs, flowers, grasses and ferns that have evolved in a particular area, such as Southeast Michigan, over thousands of years, and existed in the area before European settlement. Over this long period of time, these plants have adapted to the particular growing conditions present here, including temperature, rainfall, winds, soils, slopes and fauna. A native plant *community* is a combination of different plant species that have evolved together, and share the same site conditions, including soils, climate and hydrology. An example of a plant community native to Southeast Michigan is an Oak-Hickory woodland, which occurs in upland areas on dry, well-drained soils, and where drought is a major habitat characteristic.

To impact water quality, communities can encourage the use of native plants in two basic ways:

- 1) Preservation and restoration of native plant communities in open space, buffer zones, and community-owned land, such as parks and municipal building properties.
- 2) Landscaping with native plant species on municipally-owned and privately-owned lands.

Preservation and Restoration of Native Plant Communities

Preserving existing native plants or restoring the plant community on a development site or within a community park can have significant impacts on the quantity and quality of storm water runoff coming from that site. The benefits of native plant preservation/restoration include:

- *Improved storm water infiltration and absorption.* Native trees, shrubs and ground layer plants, such as prairie grasses, can absorb a great deal of storm water. The plant's deep root systems also create a maze of cavities that storm water can penetrate, enhancing the

ground's infiltration. Improving infiltration of storm water can help to restore ground water supplies. Reducing the amount of storm water that goes into a stream can protect the stream bed from "flashy flows" where a lot of water reaches the stream at the same time, eroding the banks, depositing this soil into the water, and degrading wildlife habitat.

- *Improved storm water filtration.* By preserving the existing vegetation along a water body, such as a river or lake, any runoff from the adjacent land will have to make its way through the stems of the buffer plants before it reaches the water body. This slows the water's progress, making it more likely that the water will be absorbed by the ground or the plants themselves, as well as allowing sediments and heavy substances to settle out of the water before it reaches the river or lake. This improves water quality. In contrast, turf grasses' fine stems do not slow the water as much, and the ground that the turf is planted on is generally compacted, not allowing much water absorption.

Preserving native vegetation along undeveloped reaches of stream or river banks is an easy and cost effective way of protecting water quality from polluted runoff. "Restoration" of native plant communities differs from landscaping in that the plants are chosen to mimic the plant community being restored, and they are arranged as they would be in nature, rather than in a "garden" arrangement.

Language that discusses the benefits of preservation of native vegetation can be added to the community's Master Plan, in conjunction with goals and policies for natural feature preservation. It can also be added to a native plant ordinance that provides guidelines on preserving native vegetation.

Example Language for Preservation of Native Vegetation

This (Master Plan/ordinance) works to maximize the use of native plants in the landscapes of all development projects including the preservation of existing vegetation on a site. The following suggestions are guidelines that describe different ways of preserving native vegetation during the site development process.

Standards:

- *Protect and conserve existing native plant communities by locating development in areas of the site, if any, that have been previously disturbed. Priority for preservation should be given to native plant communities that are contiguous with other tracts of existing natural areas or designated open space, and /or for native plant communities that are made up of a rich variety of species that indicates a site of high ecological significance.*
- *Maintain the existing hydrology of the site so as not to significantly increase or decrease the amount of water flowing to existing native plant communities to be conserved*
- *Designate a natural features setback of xxx' between the existing native plant community and proposed development, or private property lines in case of a residential development. Locate the edge of natural features setbacks with permanent markers.*
- *Provide language in Master Deed and Bylaws that specifically protects the existing native plant communities to remain on site from alteration, removal or destruction, except for annual maintenance requirements, such as mowing or prescribed burning.*

The following standards provide important information regarding site work.

Standards:

- *All topsoil that is stripped from the areas to be developed shall be stockpiled on site. Topsoil shall be stockpiled based on soil type and shall be replaced in areas of similar soil types on site. Bringing in new topsoil to the site should be avoided, as this brings in weed seeds and other exotic plant species from off site.*
- *If infiltration areas are to be seeded with a prairie grass or other grass mix, all soils to be seeded are to be broken up to a minimum of 6" deep if heavy equipment has compacted the soil during construction. This scarification will create air pockets and the start of a route for storm water to enter the soil.*
- *Where degraded ecosystems exist on a site, appropriate native plant species should be used to restore the landscape. This can be accomplished to improve storm water infiltration and water quality, habitat for wildlife and community character.*

Landscaping with Native Plants

Native plants can be used in landscaping to create a “natural-looking” environment, or they can be used in traditional arrangements in urban landscaped areas. Many possess ornamental qualities that contribute to an attractive planting.

Using native plants in landscaping will provide many benefits, including the following:

- Native plants are well-adapted to local conditions, therefore requiring little maintenance once established. They eliminate or significantly reduce the need for fertilizers, pesticides, water and lawn maintenance equipment. They also often attract beneficial insects, which prey upon pests, decreasing the need for pesticides.
- Native plants reduce air pollution, improve water quality and reduce soil erosion. Using native vegetation, unlike cultivated landscapes, does not require the use of lawn maintenance equipment, a major contributor to air pollution. They improve water quality by filtering contaminated storm water, and reduce soil erosion by stabilizing soils with their deep root systems.
- Most native species are perennial, or self-seeding biennial plants.
- Native plants attract our native songbirds and butterflies. Just as the plants have evolved and adapted to our area over time, the local wildlife has evolved along side them, depending on these plants for food and shelter.
- Using native plants promotes biodiversity. Planting a small meadow that once was lawn replaces one plant species with many, increasing the opportunities for beneficial wildlife and insects to live. We are also learning that genetic diversity is an increasingly important resource for our planet. Native plants carry a part of this rich, complex, and continually evolving genetic heritage. In contrast, non-native plants, sold mostly as cultivars, tend to represent a very limited pool of genetic material, bred for uniformity and consistency.
- Native plants maintain our natural heritage and our community’s character.
- Native plants are less expensive to maintain. U.S. EPA reports that a prairie or wetland costs approximately \$150 a year per acre to maintain, while the same amount of lawn costs \$1,000 per year per acre to maintain.

Local communities can modify ordinances and municipal procedures to accommodate using native species in either a traditional planting or a more natural arrangement. Note that many local “weed” ordinances prohibit plants or grasses to be maintained above a certain height (usually 18” – 24”). Therefore, existing regulations may need to be modified to permit “natural landscaping.”

The following language provides guidelines to developers, designers, and residents about acceptable native plant installation and maintenance.

Many native species are available from commercial nurseries within the region. A helpful listing of these plants is available from Springfield Township (Oakland County) in the form of a computer CD. They have developed this CD to assist residents in choosing native plants for

their landscapes. It has also been given to interested developers, engineers, and site designers. To request a CD, call the Clerk's office at (248) 846-6510.

Example Language for Landscaping With Native Vegetation

The following definitions provide a common understanding of terminology used in the native plant provisions.

Definitions:

- *Cultivar – A certain variant of a species that is propagated for ornamental use. The cultivar name is always enclosed in single quotation marks or designated “cv.”; it is not italicized. Example: Acer rubrum ‘Sunset’.*
- *Environmentally-Sound Landscape Management Practices – Landscape management practices that use appropriate native plant species for the site conditions, reduces the need for irrigation, eliminates the use of chemical pesticides and fertilizers, and significantly reduces or eliminates the use of gasoline-powered landscaping equipment.*
- *Exotic Plant Species – A plant species that has evolved in a country or region other than Oakland County and has been introduced by human activity.*
- *Exotic Invasive Plant Species – An exotic invasive plant species is an exotic plant species that has no natural controls and is able to out-compete and gradually displace native plants. A list of prohibited exotic invasive plant species is included in this ordinance.*
- *Floristic Quality Assessment – A Floristic Quality Assessment is a method for evaluating the relative significance of tracts of land in terms of their native floristic composition. This method was developed by the Michigan Department of Natural Resources. The plant list that results from this process provides information about the ecosystems on the site, the condition of those systems, and gives guidance to what native plant species would be appropriate to use in landscaping the site after development has occurred.*
- *Native Plant Species – A native plant species is one that has naturally evolved in a certain area over thousands of years under certain soil, hydrologic, and other site conditions. Where “native plant species” is used in the text, this means a straight species, not a cultivar of a species.*
- *Native Plant Community – A collection of plant species native to _____ County that have evolved together under similar site conditions.*
- *Natural Landscaping – A property that is landscaped so as to exhibit the deliberate and conscious decision to plant, cultivate and maintain those native species identified as wildflower, grass, shrub, or tree in commonly accepted publications, including “Michigan Flora” by Edward Voss, all volumes. This landscaping tries to capture the character and spirit of nature in a designed landscape by arranging plants in a community context, similar to their arrangement in nature.*

Language that could be included in the “intent” portion of a landscaping ordinance includes the following:

It is the intent of this ordinance 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.

The community encourages the use of native plants in this ordinance is based on the following:

- *Native plants are a necessary part of the proper functioning of natural ecosystems within (community name) and perform tasks including, but not limited to, storm water attenuation, uptake and purification, air purification, wildlife food and habitat, and community character and aesthetics; and*
- *Landscaping with native plants encourages environmentally-sound maintenance practices by requiring little or no pesticide or fertilizer use, and minimal watering to get plants established, which, in turn, reduces the threat of environmental degradation; and*
- *The community has stated in its Master Plan the goal to preserve the natural features and character of the community lands and protect the quality of vital air, land and water resources; and*
- *Encourage the use of desirable native species of vegetation. The community recognizes that species native to the local area are generally hardier, offer more wildlife benefit, filter pollutants, are an effective component in storm water management, and support and complement local ecosystems. Additionally, native species require less maintenance, water and chemicals (including fertilizers and pesticides), and are drought resistant. It is the intent of this ordinance to encourage the use of desirable native species of plants for all landscaping.*

The following elements could be incorporated as separate items throughout a landscaping ordinance:

1. Noxious Weeds.

Noxious weeds are those defined per the Michigan Seed Law, P.A. 329 of 1965, as amended, Regulation No. 715, Rule 7. The noxious weeds are not native plants. They are introduced species. These plants are also prohibited from being used in any natural landscaping.

It shall be the responsibility of the owners of all subdivided lots to adequately control the growth of noxious weeds on their lot. The control of such weeds shall be by cutting said weed on a regular basis during the growing season so as to limit the height of said weeds to not more than six (6) inches. In the event the lot owner does not comply with this section of the ordinance, the (City, Township, etc.) shall, after written notice to the owner of record on the latest assessment roll, have the right to enter upon said lot or lots and cut said weeds in compliance with this ordinance. The cost of such action by the (City, Township, etc.) shall only apply to lots in subdivision and not to any other land within the (City, Township, etc.).

2. Private Naturally Landscaped Lots

A private, “naturally landscaped” lot is a privately-owned lot where the landscaping exhibits the deliberate and conscious decision to plant, cultivate and maintain native plant species. A naturally landscaped lot often has a significantly different character than a traditionally landscaped lot, as it generally does not include much mown lawn, but is made up of relatively tall plants, often in an arrangement that emulates nature.

Naturally landscaped lots must be maintained so that herbaceous plants are mown or cut to 18” or less at least once prior to June 1 of each calendar year.

Natural landscaping on private lots shall not be located within two (2) feet of the front property line or at corner side property lines of lots having a public sidewalk, or within four (4) feet of any other property line; provided, however, no rear or side yard setback shall be required where the natural landscaping material is separated from adjacent lots by fencing or bushes, or where the natural landscaping material abuts permitted natural landscaping material on an adjacent lot. An intervening path or sidewalk shall not be deemed to prevent natural landscape materials from “abutting” for purposes of this section.

3. Prohibited Plant Species

The following plants are prohibited for use in landscaping activities. Most of these plants are not native to the area, reproduce profusely and have potentially harmful effects on natural ecosystems. They are known as “**exotic invasive species**”

Common Name (Botanic Name):

Trees:

Norway Maple (*Acer platanoides*)
Amur Maple (*Acer ginnala*)
Tree of Heaven (*Ailanthus altissima*)
European Alder (*Alnus glutinosa*)
Goldenraintree (*Koelruteria paniculata*)
Amur Cork Tree (*Phellodendron amurense*)
White Poplar (*Populus alba*)
Siberian Elm (*Ulmus pumila*)

Shrubs and Vines:

Porcelainberry (*Ampelopsis brevipedunculata*)
Japanese barberry (*Berberis thunbergii*)
Common barberry (*Berberis vulgaris*)
Butterfly Bush (*Budlia davidii*)
Oriental Bittersweet (*Celastrus orbiculatus*)
Cotoneaster (*Cononeaster microphyllus*)
Cotoneaster (*Cotoneaster pannosus*)
Cotoneaster (*Cotoneaster lacteus*)
Autumn Olive (*Eleagnus umbellata*)
Russian Olive (*Eleagnus angustifolia*)

Burningbush (*Euonymus alatus*)
Wintercreeper (*Euonymus fortunei*)
English Ivy (*Hedra helix*)
Privet (*Ligustrum vulgare*)
Japanese Honeysuckle (*Lonicera japonica*)

Amur Honeysuckle (*Lonicera maackii*)
Morrow Honeysuckle (*Lonicera morrowi*)
Tartarian Honeysuckle (*Lonicera tatarica*)
White Mulberry (*Morus alba*)
Common Buckthorn (*Rhamnus cathartica*)
Glossy Buckthorn (*Rhamnus frangula*)
Multiflora Rose (*Rosa multiflora*)
Japanese Spiraea (*Spiraea japonica*)
Japanese Yew (*Taxus cuspidata*)
Guelder Rose (*Viburnum opulus* var. *opulus*)

Grasses and Grass-Like Plants:

Pampas Grass (*Cortaderia selloana*, *C. jubata*)
Chinese Silver Grass (*Miscanthus sinensis*)
Giant Reed (*Phragmites communis*)
Reed Canary Grass (*Phalaris arundinacea*)
Ribbon Grass (*Phalaris picata*)

Flowers and Groundcovers:

Creeping Bugleweed (*Ajuga reptans*)
Garlic Mustard (*Alliaria officinalis*)
Spotted Knapweed (*Centaurea maculosa*)
Crown Vetch (*Coronilla varia*)
Foxglove (*Digitalis purpurea*)
Japanese Knotweed (*Fallopia japonica*)
Dame's Rocket (*Hesperis matronalis*)
Purple Loosestrife (*Lythrum salicaria*)
Pachysandra (*Pachysandra terminalis*)
Myrtle, or Periwinkle (*Vinca minor*)

4. Plant Rescue and Transplantation

In the development of many sites, there are appropriate native plant species that exist on the site that will be destroyed by development, but could be transplanted to other areas on a site. If this is the case, the following suggested guidelines should be followed:

Standards:

- *Where native plant species are being displaced by development, herbaceous and woody plants should be rescued to the extent possible before all land clearing operations begin. Plants that can be successfully transplanted should be designated by a qualified botanist during the site plan review process. These plants should be protected from construction activity and maintained in a healthy condition on site until they can be transplanted to other areas of the site.*
- *Woody native plant species that are rescued from developed areas of a site may be used to fulfill landscaping requirements. Plants of a size smaller than the sizes outlined in this landscape ordinance are allowed as long as the plants are no less than one-half the required size, and that the total number of plants used adds up to the size requirements for a single species. For example, two, rescued 1-1/4" caliper Oaks can be used instead of one, 2-1/2" caliper Oak.*

- *Native plant species should not be removed for transplanting or for other purposes from undisturbed areas of the site, or areas designated as preservation or conservation areas. Federal and state laws protecting native plant species designated as endangered, threatened or of special concern must be adhered to and under no circumstances shall these plants be damaged, destroyed or removed from the site.*
- *Plants that will otherwise be destroyed through construction activities can be rescued from one site for transplanting to another site as long as permission for removing the plants is granted, in writing, by the land owner, and that the plants are inspected by the Michigan Department of Agriculture Pesticide and Plant Pest Division. Inspection is also necessary if the plants are moved across a public road, even if the road is on the same property as the plant's original location.*

5. Exotic Invasive Species Removal

Recommended standards for removing exotic invasive species are described below:

Standards:

Where possible, exotic invasive plant species should be removed where they exist within native plant communities to remain after development is complete. Tested methods for removal of specific species should be employed to ensure that the invasive species do not return in the same or increased numbers.

6. Native Plants in Landscaping

If native species are to be used in landscaping and plantings, the following guidelines should be considered:

Standards:

- *Native plant species chosen for a site should be based on the existing vegetation and site conditions. The woodland, wetland or meadow species that currently grow on a site indicate the native species to be used in landscaping the site.*
- *For traditional landscaping arrangements, it is recommended that native plant species rated a 0 through 7 in the Michigan Floristic Quality Assessment Plant Database be used. Rationale for this recommendation is that the rarest plants (rated 8 – 10) are not readily available from local genetic stock and that common species (rated 0 – 2) are readily available through local nurseries. Endangered, threatened or special concern plants should be avoided altogether. Listing of these plants are available from the (City, Township, etc.)*
- *For natural landscaping arrangements, such as open spaces or storm water systems, it is recommended that native plant species rated 3 through 7 in the Michigan Floristic Quality Assessment Plant Database be used. Rationale for this recommendation is that the rarest plants (rated 8 – 10) are not readily available from local genetic stock, and the most common plants (rated 0 – 2) will most likely be in the seed bank in existing topsoil or come in on their own. Endangered, threatened or special concern plants should be avoided altogether. Listings of these plants are available from the (City, Township, etc.)*

- *In entryways or other areas where aesthetics is of primary importance, cultivars of native plant species may be considered to ensure, to a certain degree, the plant's appearance.*
- *Plantings installed in areas of storm water conveyance, infiltration, or retention/detention should be planted with native species that specifically perform the necessary runoff attenuation, filtration, water uptake and purification functions needed in such areas. Both herbaceous and woody species should be incorporated into the plant mix, where the desired function dictates.*
- *The arrangement of native species can be designed in both conventional arrangements, or more "natural" arrangements. Natural arrangements emulate the arrangements found in nature within the particular plant community being used for landscaping purposes. Natural arrangements should be used for landscaping open space, such as surface storm water systems, street tree plantings, and/or parks. If natural arrangements are used, plant spacing requirements can be relaxed as long as the function the plants are to serve is accomplished.*
- *The number of native species used in a natural arrangement should be more complex, and somewhat representative of the plant community being emulated, than would be used in a conventional planting arrangement.*

7. Maintenance

One purpose of using native vegetation is to reduce the amount of maintenance and watering required, eliminate the use of chemical fertilizers and pesticides, and reduce emissions from gasoline-powered landscaping equipment. These guidelines provide suggestions about how this can be accomplished.

Standards:

- *All ecosystem types should be maintained using environmentally-sound practices that will keep the plants in a healthy and thriving condition without the use of toxic chemicals. Maintenance program should be based on the ecosystem type. For instance, prairie plantings require annual or biannual mowing or burning to encourage new, vigorous growth.*
- *If a native planting is installed in a landscape bed that would otherwise require irrigation, the Planning Commission may waive this requirement if the plants selected are drought-tolerant species, and that the planting will be regularly watered for the first full growing season so that the plants are well established.*
- *Residential landscapes that use native plants in a natural arrangement must be maintained to keep a mown edge three (3) feet wide and not higher than six (6) inches along all public sidewalks, and a strip not less than three (3) feet wide adjacent to neighboring property lines unless waived by the abutting property owner on the side affected. Vegetation must not interfere with site distances from driveways and roads.*

Local communities can also encourage landscaping with native vegetation through the following:

- Provide leadership by increasing the use of natural landscaping on public properties.
- Provide information to residents, businesses, developers and design professionals (through site plan review process) on the benefits of landscaping with native vegetation.
- Develop a multi-year plan for retrofitting native vegetation into existing sites.
- As mentioned above, amend or replace the local weed ordinance so that it encourages natural landscaping.
- As mentioned above, ensure that storm water management program uses native vegetation in design of storm water BMPs.

3) Resource Protection Overlay District

Overlay districts are one approach to applying special restrictions to areas with unique conditions. Properties included within these districts retain their underlying zoning classification but are subject to additional requirements specified in the overlay district ordinance. In preparing an overlay district, it is first necessary to identify the geographic limits of the areas to be included. This involves clearly stating the purpose for creating a district as well as reflecting established local preservation policies.

The adoption of an overlay district accomplishes three objectives:

- 1) Requires all parcels within the district to be inventoried, although this may be done one parcel at a time. Potential development of the site is what generally triggers the required inventory.
- 2) Alerts a developer of the site's potentially significant resources and that it would be subject to special restrictions; and
- 3) Allows the community to identify those priority protection areas on a site that a developer must refrain from developing or develop with minimal site disturbance.

With an overlay zone, sites will get inventoried either lot by lot, or through a comprehensive survey initiated by the community. In the inventory process, it is important to determine the full ecological significance of a parcel in relationship to its surroundings. If a lot-by-lot inventory process is adopted, it is better to have sites prioritized for inventory, so as money is made available for a full ecological field study, priorities will have been established and permission granted by property owners for site access.

Example Resource Protection Overlay District.

1. *Purpose. The purpose of this Section is to ensure that property is developed in a manner consistent with its zoning designation, and the proposed physical elements 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 the Community as Resource Conservation areas, Land Use Plan, and Valuable Natural Areas, Natural Features, within the Community Master Plan. The Overlay District establishes procedures to enable the applicant and the Community to achieve the mutually compatible objectives of reasonable use of land and protection of vital natural resources.*

2. *Applicability. To the maximum extent feasible, any development plan (i.e. site plan, subdivision plat and site condominium plan) shall be designed and arranged to ensure that disturbance to any priority resource protection area as a result of the development, and that impacts and disturbance to such areas and the plants and wildlife inhabiting those areas, shall be minimized through the use of natural area buffers, conservation easements and creative land development techniques. To that end, the Community has established that this Section shall apply to lands that meet both of the following criteria:*
 - a. *The property is indicated on the Community Zoning Map, entirely or in part, as AGRE, Agricultural Residential or RE, Rural Estate, or SR, Suburban Residential, and;*
 - b. *The property is designated entirely or partially as Resource Conservation on Map x, Land Use Plan, of the Community Master Plan.*
3. *Ecological Characterization. It is intended that these Ordinance requirements be applied based upon reliable and factual data. Applicants are encouraged to consult the Michigan Natural Features data base. In addition, information contained in [any available natural features inventory] is useful to determine important natural areas of the Community, of which x valuable natural areas have been identified within the Community. These areas have significant value to the community and are indicated on Map x, Natural Features, of the Community Master Plan.*

If a development site is determined by the Community, based on additional information or from inspection, that the site likely includes areas with wildlife, plant life and/or other natural characteristics in need of protection, and if the Community does not then possess the information required to apply review standards, then the developer shall provide to the Community a report prepared by a professional qualified in the areas of ecology, botany, wildlife biology or other relevant discipline that describes, without limitation, the following:

- a. *the wildlife use and habitat showing the species of wildlife using the area, the times or seasons that the area is used by those species and the "value" (meaning feeding, watering, cover, nesting, roosting, perching) that the area provides for such wildlife species;*
- b. *the boundary of wetlands in the area and a description of the ecological functions and characteristics provided by those wetlands;*
- c. *any prominent views from or across the site;*
- d. *the pattern, species and location of any significant native trees and other native site vegetation;*
- e. *the bank, shoreline and high water mark of any stream or body of water on the site;*
- f. *wildlife movement corridors; and*
- g. *the general ecological functions provided by the site and its features.*

The Community may employ their own consultants with the relevant expertise to review materials submitted by the applicant. The applicant shall be required to provide and

present the credentials for all qualified professionals hired for the purpose of fulfillment of Section (C). The credentials and qualifications of these individuals shall be sufficient, in the opinion of the Community, to demonstrate competence in the area in which the expertise will be provided.

4. *Establishment of Priority Protection. For every development subject to this Ordinance, the applicant shall propose areas of priority protection. The Community shall review these areas for appropriateness. If acceptable, the Community shall accept and establish on the*

project development plan, areas of priority protection. The development plan shall establish the development capability of the site and indicate the specific area(s) of a site within which the developed project may be constructed and within which the development activity shall be contained. In establishing the development capability of a site, the Community shall consider and apply the following criteria:

- a. *The actual boundary of development capability designation to be shown on a development plan shall be proposed by the applicant, and established by the Community through site evaluations and reconnaissance, and shall be based on the ecological characterization of the area.*
- b. *In establishing the development capability of the site, the following shall be taken into account, as evaluated by qualified professional(s) and/or certified consultant(s):*
 - (1) *visual impacts, including but not limited to ridgeline protection areas and protection of scenic views.*
 - (2) *erosion prevention and control, including but not limited to protection of natural drainage channels and compliance with an approved storm water drainage management plan.*
 - (3) *preservation of significant native trees and other native site vegetation, including protection of natural area buffers zones.*
 - (4) *conservation of water, including but not limited to preservation of existing native vegetation, reduction in amounts of irrigated areas and similar considerations.*
 - (5) *stream corridor and wetland protection and buffering.*
 - (6) *site topography, including but not limited to such characteristics as steepness of slopes, existing drainage features, rock outcroppings, river and stream terraces, valley walls, ridgelines and scenic topographic features.*
 - (7) *floodplains and floodways.*
 - (8) *wildlife movement corridors.*
 - (9) *natural area buffer zones as delineated below.*
 - (10) *the practical needs of approved construction activity in terms of ingress and egress to the developed project and necessary staging and operational areas.*

(11) hydrology and groundwater flow.

5. Development Standards and Guidelines.

a. To the maximum extent feasible, no construction activity, including, without limitation, grading, excavation or stockpiling of fill material, shall be permitted within priority protection areas whether to provide for a building site, on-site utilities or services, or for any roads or driveways except as provided for below.

(1) mitigation of development activities;

(2) restoration of previously disturbed or degraded areas;

(3) emergency public safety activities and utility installations, installed with the utmost sensitivity to natural features, when such activities and installations cannot reasonably be contained to areas outside of those identified as significant;

(4) construction of trails or pedestrian walkways that will provide access in an environmentally appropriate manner;

(5) the enhancement of the habitat values and/or other natural resource values of a natural area.

b. Establishment of Buffer-Zones. Buffer zones shall be established adjacent to areas of priority protection. Such buffers shall be up to one hundred (100) feet in width. The Community may reduce the perimeter setback and buffer zones in cases where the density of the proposed use is compatible with adjacent uses and/or natural features, such as woodlands and topographical features. In establishing the buffer zone(s), the Community shall consider and apply the following criteria:

(1) the foreseeable impacts of development on the wildlife usage or ecological character or function of the natural area.

(2) the ecological and wildlife use characterization of the natural area.

(3) the existence of wildlife movement corridors.

(4) the extent of floodplains and floodways.

(5) the type, amount and extent of existing vegetation on the site.

(6) the existence of special wildlife habitat features.

(7) the character of the proposed development in terms of use, density, traffic generation, quality of runoff water, noise, lighting and similar potential development impacts.

(8) site topography, including but not limited to such characteristics as steepness of slopes, existing drainage features, ridgelines and scenic topographic features.

- c. *Mitigation of Disturbance.* While development is anticipated outside of priority protection areas, the applicant shall avoid disturbance to priority protection areas and undertake mitigation measures to restore any damaged or lost natural resource. Any such mitigation or restoration shall be roughly equivalent to the loss suffered by the Community because of the disturbance, and shall be based on such mitigation and restoration plans and reports as have been requested, reviewed and approved by the Community. The mitigation plan shall include a timeline for restoration and mitigation of disturbed areas, which must be acceptable to the Community. The Community may require performance guarantees pursuant to Section x of the Zoning Ordinance

insuring fulfillment of, and compliance with, the mitigation plan. In addition, the Community may issue a cease and desist order of the site development activities if determined to be in violation of the approved mitigation plan.

- d. *Connections.* If the development site contains priority protection areas that connect to other off-site areas of a similar nature, to the maximum extent feasible, the development plan shall preserve such connections. If priority protection areas lie adjacent to the development site, but such areas are not presently connected across the development site, then the development plan shall, to the extent reasonably feasible, provide such connection. Such connections shall be designed and constructed to allow for the continuance of existing wildlife movement between natural areas and to enhance the opportunity for the establishment of new connections between areas for the movement of wildlife.

- e. *Lakes, Reservoirs and Ponds.* If the development site contains a lake, reservoir or pond, the development plan shall include such enhancements and restoration as are necessary to provide reasonable wildlife habitat and improve aesthetic quality in areas of shoreline transition and areas subject to wave erosion. The development plan shall also include a design that requires uniform and ecologically and aesthetically compatible treatment among the lots or tracts surrounding a lake, reservoir or pond with regard to the establishment of erosion control protection and shoreline landscaping on or adjacent to such lots or tracts.

- f. *Design and Aesthetics.* Projects located within the Overlay District, shall be designed to complement the visual context of the natural area. Techniques such as architectural design, site design, the use of native landscaping and choice of colors and building materials shall be utilized in such manner that scenic views across or through the site are protected, and manmade facilities are screened from off-site observers and blend with the natural visual character of the area.

- g. *Storm water Drainage/Erosion Control.* All storm water drainage and erosion control plans shall meet the standards adopted by the Community for design and construction and shall, to the maximum extent feasible, utilize nonstructural control techniques, including but not limited to:

(1) *limitation of land disturbance and grading;*

(2) *maintenance of vegetated buffers and natural vegetation;*

(3) *minimization of impervious surfaces;*

(4) use of terraces, contoured landscapes, runoff spreaders, grass or rock-lined swales;

(5) use of infiltration devices.