



*City of Middletown
Connecticut*

*Stormwater Management Plan
Annual Report for 2011*

Table of Contents

Stormwater Program Permit Information	3
General Information for Receiving Waters	4
Plan Contents Summary	5
Public Participation/Involvement	6
Public Education and Outreach.....	7
Illicit Discharge Detection and Elimination	9
Construction Site Runoff Control	12
Post-Construction Runoff Control	18
Pollution Prevention/Good Housekeeping	20
Responsible Party Assignments	22
Certification Sheet	23

Date Prepared: 12/21/2011

Stormwater Program Permit Information

1. **Permitting Authority:** State of Connecticut D.E.P.
2. **Application Number:** 200400292
3. **Permit Type:** General
4. **Permit Name:** General Permit for the Discharge of Stormwater from Small Municipal Separate Storm Water Systems
5. **Date Issue:** 2/11/2004
6. **Date Expire:** 1/08/2009

General Information for MS4 Operator

1. **Operator Name:** Daniel Drew
2. **Operator Title:** Mayor
3. **Represented Entity:** City of Middletown
4. **Mailing Address:** P.O. Box 1300, 245 deKoven Drive
5. **Mail City, State, Zip:** Middletown, CT 06457
6. **Phone Number:** (860) 344-3401
7. **E-Mail Address:**
8. **Co-Permitting With:**
9. **Population:** 47,648 **Households:** 19,863 **Area (sq mi):**42.44
10. **Official Website:** www.cityofmiddletown.com

General Information for Primary Contact Person

1. **Name:** Thomas Nigosanti
2. **Title:** City Engineer
3. **Phone Number:** (860) 344-3549
4. **E-Mail Address:** tom.nigosanti@cityofmiddletown.com

General Information for Secondary Contact Person

1. **Name:** Robert Dobmeier
2. **Title:** Deputy Director of Public Works
3. **Phone Number:** (860) 344-3413
4. **E-Mail Address:** bob.dobmeier@cityofmiddletown.com

General Information for Receiving Waters

Receiving Water Lists: Listed below are all the identified receiving waterbodies to which identified outfalls discharge.

Receiving Streams	Receiving Waterbodies	Receiving Watersheds
Mattabesset River	Highland Pond	4600
Spruce Brook	Adder Reservoir	5206
West Spruce Brook	Mont Higby Reservoir	4604
East Spruce Brook	Cucia Park Pond	4607
Sawmill Brook	Westlake	4605
Snow Hill Brook	Miner Pond	4014
West Highland Brook	Star Mill Pond	4013
Richard's Brook	Red Road Pond	4000
Manthay Brook	Laurel Brook Reservoir	
East Fall Brook	Butternut Hollow Pond	
Fall Brook	Swales Pond	
Spoon Shop Brook	Nettis Pond	
Bradley Brook	Wesleyan Hills Pond	
East Bradley Brook	Cypress Pond	
West Bradley Brook	Dooley Pond	
Miner Brook	Pameacha Pond	
East Miner Brook	Zoar Pond	
Little River	Rubber Mill Pond	
Swamp Brook	Crystal Lake	
Connecticut River	Toll Gate Road Pond	
East Swamp Brook	Brook CVH Reservoir #1	
West Swamp Brook	Brook CVH Reservoir #2	
Coginchaug River	River Road Reservoir	
Laurel Brook	CVH Reservoir #3	
Long Hill Brook	Hubbard Pond	
Round Hill Brook		
East Round Hill Brook		
West Round Hill Brook		
Sumner Brook		
Prout Brook		
Harris Brook		
Indian Hill Brook		
Reservoir Brook		
Connecticut River		

Plan Contents Summary

The Stormwater Management Plan consists of the following Minimum Control Measures and BMPs:

Public Participation/Involvement

1. Community Clean-ups
2. Stormwater Management Plan Update

Public Education and Outreach

1. Develop Educational Resources

Illicit Discharge Detection and Elimination

1. Drainage Outlet Survey
2. Illicit Discharge Ordinance
3. Illicit Discharge Detection
4. Recycling Program
5. Sewer System Map

Construction Site Runoff Control

1. Ordinance / Regulatory Mechanism
2. Site Plan Review
3. Construction Inspection Program

Post-Construction Runoff Control

1. Water Quality & Quantity Review

Pollution Prevention/Good Housekeeping

1. Develop Pollution Prevention Plan
2. Maintenance Schedule
3. Stormwater Management System

Public Involvement/ Participation

Description:

To satisfy this minimum control measure, the City of Middletown intends to:

1. Comply with applicable State public notice requirements; and
2. Develop a public involvement/participation program that includes the public in developing, implementing, and reviewing our stormwater management plan.

EPA believes that the public can provide valuable input and assistance to a regulated small MS4's municipal storm water management program and, therefore, suggests that the public be given opportunities to play an active role in both the development and implementation of the program. An active and involved community is crucial to the success of a storm water management program because it allows for:

1. Broader public support since citizens who participate in the development and decision making process are partially responsible for the program and, therefore, may be less likely to raise legal challenges to the program and more likely to take an active role in its implementation;
2. Shorter implementation schedules due to fewer obstacles in the form of public and legal challenges and increased sources in the form of citizen volunteers;
3. A broader base of expertise and economic benefits since the community can be a valuable, and free, intellectual resource; and
4. A conduit to other programs as citizens involved in the storm water program development process provide important cross-connections and relationships with other community and government programs. This benefit is particularly valuable when trying to implement a storm water program on a watershed basis, as encouraged by EPA.

Details of BMPs and Activities

1. Community Clean-ups

Responsible Party: Various people

BMP Description:

Using volunteers for water quality monitoring will give citizens first-hand knowledge of the quality of local water bodies and provide a cost-effective means of collecting water quality data.

Involve several neighborhoods through this organization to help in community clean-ups. Try to coordinate water monitoring and stream clean-up with CRGC, MRWA, Riverwatch, and Nature Conservancy.

The goal is to involve the public in the water quality sampling procedures and to educate the public of water quality concerns.

Activities:

Oct. 1 Our annual Coginchaug River Cleanup at Veteran's Park in collaboration with Middletown Regional Agricultural Science and Technology Center, held October 1, 2011 as part of the watershed-wide Connecticut River Watershed Council Source to Sea Cleanup. Despite the fact that the river was cleaned up a year ago, volunteers once again picked up an impressive dump truck full of trash, with many recyclables separated out. A total of 21 students, parents, and members of the community helped. The City of Middletown Parks and Recreation Department provided cleanup supplies and a dump truck for the event.

2. Stormwater Management Plan Update

Responsible Party: Matt Dodge, Environmental Planner

BMP Description:

The intent of this BMP is to schedule annual public meetings to be held with the Inland Wetlands Commission to review and update the stormwater management plan.

The goal is to review past performance, suggest changes to plan, receive input from the public, and improve the effectiveness of the plan.

Activities:

The 2011 Stormwater Management Plan has been sent to the Environmental Planner. He will put it on the agenda for the Inland Wetlands Commission to review.

Public Education and Outreach

Description:

To satisfy this minimum control measure, the City of Middletown intends to:

1. Implement a public education program to distribute educational materials to the community, or conduct equivalent outreach activities about the impacts of storm water discharges on local waterbodies and the steps that can be taken to reduce storm water pollution; and
2. Determine the appropriate best management practices (BMPs) and measurable goals for this minimum control measure, and
3. Designate a responsible person for each BMP.

An informed and knowledgeable community is crucial to the success of a storm water management program since it helps to ensure the following:

1. Greater support for the program as the public gains a greater understanding of the reasons why it is necessary and important. Public support is particularly beneficial when operators of small MS4s attempt to institute new funding initiatives for the program or seek volunteers to help implement the program; and
2. Greater compliance with the program as the public becomes aware of the personal responsibilities expected of them and others in the community, including the individual actions they can take to protect or improve the quality of area waters.

Details of BMPs

1. Develop Educational Resources

Responsible Party: Kim O'Rourke, Recycling Coordinator

BMP Description:

Develop a program to distribute information to the public at meetings and at schools.

First goal is to distribute brochures to all elementary school children to bring home to their parents.

Second goal is to develop brochures for distribution to the public at meeting or to be included with water bills.

Third goal is to create a storm water hotline or web page for information and for citizen reports on polluters.

Activities: The following activities took place this year:

- | | |
|-------------|--|
| Jan. 4 | Conducted a radio interview on organic lawn care and pollution issues related to traditional lawn care chemicals. |
| March 8 | Program at Russell Library for families. Distributed stormwater brochures. |
| March 9 | Presentation at the Kiwanis Club of Middletown. Distributed stormwater brochures. |
| March 16 | Applied for grant for trash compactors & recycling bins on Main Street. |
| March 22 | Rain Barrel demonstration project in collaboration with the City of Middletown to promote rain barrels as inexpensive, easy to use and maintain "green" practices that conserve water and watersheds. Rain barrels and accompanying educational signs were installed in two locations, Kidcity Children's Museum (in Fall 2010) and Russell Library (in Spring 2011). A take-away educational brochure, Rain Recycling with Rain Barrels, was also produced and is being distributed at the museum and library as part of the project. The brochure covers the fate of falling rain and polluted runoff; what rain barrels are and how they are used; the benefits of rain barrels; practical tips for their use; and where rain barrels can be purchased. |
| March 31 | Project Green Lawn film screening and discussion of <i>A Chemical Reaction</i> , a documentary about the dangerous effects of lawn chemicals and a community's successful campaign to ban them in Canada, to raise awareness about the risks associated with lawn care chemicals and promote alternative environmentally safe lawn care practices. Over 50 people attended the event, held at Middlesex Community College. |
| April 5 | Presentation at Northwest Children's Center. Distributed Stormwater Runoff brochure. |
| April 12 | Radio show – discussion of organic lawn care & stormwater runoff |
| April 20 | Compost bin and Rain Barrel Community Sale. |
| April 14/15 | Presentation at Keigwin School – distributed brochures |
| April 28 | Career Fair at Wesleyan University – distributed brochures, talked to students about environmentally |

related jobs

- May 3 Workshop with City staff run by organic lawn care expert, Nancy Gift.
- May 4/12 Presentation at Moody & Keigwin – distributed brochures
- June 7 Presentation to 7th graders at WWMS. Distribution of brochures.
- June 11 Project Green Lawn display and Healthy Soil is ALIVE activity at Middletown Kids Health & Safety Day, to raise awareness about the beneficial critters in our soil that help plants grow, the environmental and public health risks of lawn care chemicals, and promote healthy chem-free lawns. Many kids participated in the activity and others looked at the display and took a Project Green Lawn brochure.
- June 28 Middletown Farmer’s Market – distribution of brochures
- July 28 Outreach at Durham Farmers Market – distribute brochures.
- Aug. 20 Organic Lawn care ad in Park & Recreation bulletin
- Sept. 12 Organic Lawn Care program at Russell Library
- Sept. 14 Outreach at Wesleyan Community Fair – distribute brochures
- Sept. 16 Presentation to afterschool program at McDonough School.
- Sept. 22 Project Green Lawn program, Healthy Fall Lawns, held at Russell Library, to promote healthy and environmentally safe lawn care practices. This event was focused on how to have a healthy lawn without using chemical pesticides and fertilizers, in particular what you can do in the fall to build a good foundation for the growing season. A total of 17 people attended the program.
- Sept. 26 Presentation to Preschool – distribute brochures.
- Oct. 4 Presentation at Green St Arts Center – distribute brochures
- Oct. 8 Household Hazardous Waste Collection – distribute brochures
- Nov. 16 Presentation at Mercy High School – distribute brochures.

Illicit Discharge Detection and Elimination

Description:

Recognizing the adverse effects illicit discharges can have on receiving waters, the final rule requires the City of Middletown to develop, implement and enforce an illicit discharge detection and elimination program. This program must include the following:

1. A storm sewer system map, showing the location of all outfalls and the names and location of all waters of the United States that receive discharges from those outfalls;
2. Through an ordinance, or other regulatory mechanism, a prohibition (to the extent allowable under State or local law) on non-storm water discharges into the MS4, and appropriate enforcement procedures and actions;
3. A plan to detect and address non-storm water discharges, including illegal dumping and future discharges, into the MS4;
4. The education of public employees, businesses, and the general public about the hazards associated with illegal discharges and improper disposal of waste; and
5. The determination of appropriate best management practices (BMPs) and measurable goals for this minimum control measure.

Discharges from MS4s often include wastes and wastewater from non-storm water sources. Illicit discharges enter the system through either direct connections (e.g., wastewater piping either mistakenly or deliberately connected to the storm drains) or indirect connections (e.g., infiltration into the MS4 from cracked sanitary systems, spills collected by drain outlets, or paint or used oil dumped directly into a drain). The result is untreated discharges that contribute high levels of pollutants, including heavy metals, toxics, oil and grease, solvents, nutrients, viruses, and bacteria to receiving waterbodies. Pollutant levels from these illicit discharges have been shown in EPA studies to be high enough to significantly degrade receiving water quality and threaten aquatic, wildlife, and human health.

Details of BMPs

1. Drainage Outlet Survey

Responsible Party: Thomas Nigosanti, City Engineer

BMP Description:

Develop a plan to inspect all outfalls to determine the presence of illegal discharges. A schedule of outfalls will be developed and the personnel when available will inspect outfalls for illegal discharges. Work will be done in the winter months, weather permitting.

Activities:

The City is being broken down into sections. Each section will have a map showing all of the detention basins and drainage outlets and their I.D. numbers. Each outlet will be inspected and photographed. When the section is complete, a report will be created listing all of the outlets, their condition, and recommended maintenance. The first section, NW Section I, is composed of 33 streets, 23 of which have drainage outlets(73), and 8 detention basins. 37 of the 73 outlets have been inspected, of those, 10 are in need of some maintenance. The goal is to finish inspecting this section this winter, completing the report in the spring, and performing the necessary maintenance this summer (2012).

2. Illicit Discharge Ordinance

Responsible Party: William Russo, Director of Public Works

BMP Description:

Create an ordinance which will regulate non-stormwater discharges into the storm system. Ordinance will include enforcement procedures and fines.

Activities:

A sample Illicit Discharge Ordinance has been sent to the Ordinance review Committee. After modifications, the draft ordinance will be sent to the Common Council for approval.

3. Illicit Discharge Detection

Responsible Party: Robert DeManche, Inspector

BMP Description:

Investigate in the field any reported Stormwater discharge that does not appear to be clean water. Water samples will be taken if necessary.

Activities:

None reported this year.

4. Recycling Program

Responsible Party: Kim O'Rourke, Recycling Coordinator

BMP Description:

Continue and update the recycling program for commonly dumped household wastes such as motor oil, antifreeze, paint, pesticides, etc. Coordinate hazardous waste disposal days. Notify the public of the hazards of illegal discharges and improper disposal of wastes.

Activities:

Jan. 12 Offered a program at Russell Library on recycling. Distributed stormwater brochure.

March 1 Meeting at Middlesex Community College to discuss recycling and sustainability issues. Distributed stormwater brochure.

March 4 Interview with WNPR on recycling, ewaste and pollution issues.

October 8 Hazardous Waste Disposal collection was held at Moody School.

Nov. 15 America Recycles Day event at Middlesex Community College – distribute brochures

5. Sewer System Map

Responsible Party: Thomas Nigosanti, City Engineer

Name of Separate Implementing Entity: UIC

BMP Description:

The storm sewer system map is meant to demonstrate a basic awareness of the intake and discharge areas of the system. It is needed to help determine the extent of discharged dry weather flows, the possible sources of the dry weather flows, and the particular waterbodies these flows may be affecting. The existing GIS map, will be overlaid with the entire storm sewer network.

The goal is to have the entire stormwater network as an interactive layer on the city's GIS. This is a continuing process as time and funding permit. For each discharge the following information shall be included:

- a. Type, material, and size of conveyance, outfall or channelized flow (e.g. 24" concrete pipe);
- b. The name and Surface Water Quality Classification of the immediate surface waterbody or wetland to which the stormwater runoff discharges;
- c. If the outfall does not discharge directly to a named waterbody, the name of the nearest named waterbody to which the outfall eventually discharges;
- d. The name of the watershed in which the discharge is located.

Activities:

We have a new contract with UIC to scan all of our maps. They will digitize them and add the drainage to our GIS.

Construction Site Runoff Control

Description:

The Phase II Final Rule requires an operator of a regulated small MS4 to develop, implement, and enforce a program to reduce pollutants in storm water runoff to their MS4 from construction activities that result in a land disturbance of greater than or equal to one acre.

The small MS4 operator is required to:

1. Have an ordinance or other regulatory mechanism requiring the implementation of proper erosion and sediment controls, and controls for other wastes, on applicable construction sites;
2. Have procedures for site plan review of construction plans that consider potential water quality impacts;
3. Have procedures for site inspection and enforcement of control measures;
4. Have sanctions to ensure compliance (established in the ordinance or other regulatory mechanism);
5. Establish procedures for the receipt and consideration of information submitted by the public; and
6. Determine the appropriate best management practices (BMPs) and measurable goals for this minimum control measure.

Details of BMPs

1. Ordinance / Regulatory Mechanism

Responsible Party: William Warner, Director of Planning, Conservation & Development

BMP Description:

Update the subdivision regulations to provide the ability to regulate polluted runoff that emanates from construction sites. Discuss the possibility of a separate bond for erosion control. Bond should be able to be called on short notice to be able to react to weather related problems. For large construction projects, require copies of the General Permit for the Discharge of Stormwater and Dewatering Wastewater Associated with Construction Activities to be on file prior to commencement of construction. Procedures for enforcement of control measures are to be set.

Activities:

The following excerpt from the City's subdivision Regulations show how we require new construction sites to have the proper erosion and sediment controls, and the procedures for Inspection and Enforcement:

SECTION 3.03- PERFORMANCE BONDS

Upon the granting of conditional final approval the Commission shall accept a performance bond in an amount sufficient as determined by the developer's engineer and approved by the Public Works Department. This performance bond agreement shall guarantee the completion of all required and remaining subdivision improvements.

A separate performance bond may be required for major subdivisions which require a substantial amount of landscaping and/or erosion and sediment control measures.

For purposes of this section a performance bond shall mean one of the following: 1.) a cash deposit in the form of a certified check; or 2.) an irrevocable letter of credit from a bank or other similar, financially stable and reputable institution subject to the approval of the Planning and Zoning Commission, the City Attorney and the Director of Finance. For the purposes of determining financial stability the Director of Finance may request financial information from the developer or the bank issuing the letter of credit. Additionally, all letters of credit upon expiration shall be renewed automatically by the issuing bank.

SECTION 3.07- CLEAN UP

It shall be a condition of the performance bond that the developer shall be required, at least every thirty days, to clean up construction debris and to remove from the subdivision site or adjoining areas all construction materials or equipment no longer needed for the work.

Any and all materials falling on a public street from vehicles or construction equipment shall be cleaned up at the end of each working day, or more frequently, depending upon the nature of the work and the nuisance created. Failure of the developer to comply with the above as determined by the Zoning Enforcement Officer shall be sufficient reason for the City to take action under the performance bond.

SECTION 3.12- FAILURE TO COMPLETE IMPROVEMENTS

Where a performance bond has been posted and required improvements have not been installed within the terms of such performance bond, the City of Middletown may thereupon, in accordance with the terms of the Agreement for Completion of Subdivision Improvements, declare the performance bond to be in default and require that all improvements be installed, using the money in the bond, regardless of the extent of building development at the time the bond is declared to be in default. Additionally or alternately, the City can revoke its conditional final approval which will halt the sale of any lots within the subdivision. The revocation of the conditional final approval shall be recorded in the Middletown Town/City Clerk's Office.

SECTION 3.15- MAINTENANCE OF IMPROVEMENTS

The developer may be required to maintain all improvements until acceptance of said improvements by the Common Council of the City of Middletown.

3.15.01 Maintenance Bond

The developer may be required to file a maintenance bond covering all work that was covered by the subdivision improvements performance bond prior to the release of said bond. This bond will be filed with the City prior to dedication in an amount determined by the Public Works Department in order to assure the satisfactory condition of the required improvements, for a period of one (1) year after the date of their acceptance by the City. In no case shall the maintenance bond be less than 10% of the cost of improvements and shall be of such form as described in Section 3.06 of these regulations.

SECTION 4.05- GRADING PLAN AND SOIL EROSION AND SEDIMENT CONTROL PLAN

When applicable a grading and soil erosion and sediment control plan shall be submitted. This plan shall be at a scale not less than 1" = 40'. The area shown on the grading and soil erosion and sediment control plan may be limited to the portion of the subdivision or re-subdivision affected by the proposed regrading, cuts, fills, and/or soil and/or rock.

As a part of the grading plan all developers shall provide, using the best available technology proper provisions for soil erosion and sediment control. A soil erosion and sediment control plan shall be submitted with any application for subdivision when the disturbed area is cumulatively more than one half acre. The Planning and Zoning Commission may also require that a bond be posted assuring that the Grading and Soil and Erosion Control Plan is implemented. The Planning and Zoning Commission may petition the Middlesex County Soil and Water Conservation District for a study to establish that a Grading and Soil Erosion and Sediment Control Plan complies with the minimum standards as set forth in Section.

A. Minimum Standards for Soil Erosion and Sediment Control Provisions

The Developer is requested to use the publication, Connecticut Guidelines for Soil Erosion and Sediment Control (latest edition), as amended, as a tool in providing all the minimum information required for soil erosion and sediment control, peak flow rates, and volumes of water runoff.

The Grading and Soil and Erosion Control Plan shall include but is not limited to, the following:

1. A narrative describing the development, the schedule of major activities on the land, (including start and completion dates, sequence of grading and construction activities, sequence for installation of erosion and sediment control measures, and sequence for final stabilization measures); the design

- criteria and construction and installation procedures for soil erosion and sediment control measures and storm water management facilities; and an ongoing maintenance program for erosion and sediment control measures and the storm water management system;
2. A site development plan as described in Section 4.02 showing the following additional information:
 - A. Areas of major regrading, cuts, fill and/or soil and/or rock removal with estimated amount of material to be added or removed and calculations of proposed cuts and fills;
 - B. Existing (dashed lines) and proposed contours (solid lines) at an interval not exceeding two (2) feet based on field and aerial survey as well as existing spot elevations (where appropriate);
 - C. The location of and design details for all proposed soil erosion and sediment control measures and storm water management facilities;
 - D. Areas in excess of 25% natural slope highlighted with cross hatching;
 - E. Existing and proposed drainage swales, wetlands and water courses;
 - F. Existing permanent buildings and structures, including well and septic locations;
 - G. Notes indicating if blasting will be required;
 - H. Cross section drawings covering proposed excavation areas;
 - I. Hydraulic computations for all culverts and bridges, stream crossings and detention/retention structures; and
 - J. Any other information deemed necessary and appropriate by the developer or requested by the Commission or its designated agent.

4.05.01 Certification

Approval of the subdivision shall constitute certification that the Grading and Soil Erosion and Sediment Control Plan complies with the requirements and purpose of these regulations. After approval of the subdivision, no site development shall begin unless the soil erosion and sediment control measures and facilities in the plan scheduled for installation prior to site development are installed, functional, and maintained until the development is complete.

4.05.02 Inspection and Enforcement

The Zoning and Inland Wetlands Enforcement Officer (ZEO) and the Public Works Department shall make periodic inspections to ensure compliance with the approved plan and that control measures and facilities are properly performed or installed and maintained. Upon finding improper installation or maintenance, The City has the authority to require compliance to the plan and/or order the contractor/developer to stop work. the Commission may ask for progress reports from the developer and/or the Zoning Enforcement Officer.

SECTION 4.06- STORMWATER RUNOFF CONTROL PLAN

The Planning and Zoning Commission shall require that the developer furnish projections of the increase in stormwater runoff created by major subdivisions. If necessary minor subdivisions may also be required to conform to these requirements.

All major subdivisions shall submit a Stormwater Quantity and Quality Control Plan which is in accordance with Section 5.23 and Public Works specifications. If the Planning and Zoning Commission or City staff conclude that adjoining lands or streets will receive an increased flow or that downstream watercourses are incapable of accommodating such flow increase, a Stormwater Runoff Quantity and Quality Control Plan may be required for minor subdivisions.

When required, the facilities shall be designed and located so as to minimize the danger to the life and property of area residents. All storm drainage controls shall be designed by a registered professional engineer.

Measures for the retention and/or detention and controlled release rate of stormwater runoff from the development shall meet the standards of the Public Works Department and the City of Middletown Ordinances, as amended.

All retention and/or detention structures shall be dedicated to the City as part of the street right of way and overall storm water managements system. The commission may consider alternatives to dedication if clear access and maintenance is assured.

The developer shall be responsible for adhering to the Middletown Code of Ordinance, Section 26-7. Acceptance and Maintenance of Stormwater Surface Runoff Facilities, as amended. The Public Works Department shall be responsible for maintenance of any such facility after acceptance of the facility by the City.

SECTION 5.23- DRAINAGE AND STORM SEWERS

5.23.01 General Requirements

The Developer shall be fully responsible for constructing adequate facilities for the control, conveyance and acceptable disposal of storm water, other surface water and subsurface water, whether originating within the subdivision area or in a tributary drainage by registered professional engineer and be subject to the approval and final acceptance by the Public Works Department.

- A. The overall drainage system for residential subdivisions requiring new city streets and industrial subdivisions shall be designed such that the runoff rate outside of the subdivision during or after development does not exceed the rate that existed prior to the development. This may be accomplished by retention/detention basins, infiltration basins or other acceptable means as determined by the Department of Public Works. Upon determination by the Public Works Department that direct discharge would be more advantageous this requirement may be waived.
- B. Where the subdivision storm drainage system is proposed to discharge into a City storm drainage system, the developer shall make provisions to accommodate the anticipated additional discharge in the event that the City system is not adequate.
- C. The storm water drainage system shall be separate and independent of any sanitary sewer system.

5.23.02 Location of Storm Water Facilities

Drainage facilities shall be located in the road right-of-way, where feasible, or in perpetual unobstructed easements, where necessary. Such easements shall be at least 30 ft. in width.

5.23.02.01 Drainage Rights

When a Proposed Drainage System will carry water across private land outside the subdivision, appropriate drainage rights must be secured and indicated on the map.

5.23.02.02 Dedication

The developer may be required to dedicate, either in fee or by drainage or conservation easement, land on both sides of existing watercourses to a distance to be determined by the Commission.

5.23.02.03 Natural Drainage ways

Low-lying land along watercourses subject to flooding or overflowing during storm periods shall be preserved and retained in their natural state as drainage ways.

5.23.03 Drainage Discharge

The discharge of all storm water from a subdivision shall be into suitable streams or other acceptable and suitable storm water drainage facilities having adequate capacity to carry the additional water. The drainage design used shall try to improve the quality of the water as possible prior to discharge.

5.23.03.01 Installation of Appropriate Facilities

Where a new street intercepts an existing street which has no underground drainage system or has a drainage system of insufficient capacity to carry the additional flow, appropriate facilities shall be installed by the Developer to intercept and dispose of any drainage from the new street which would otherwise be discharged onto the surface of the existing street or into its drainage system.

5.23.04 Under drains

Adequate under-drains shall be constructed whenever, in the opinion of the Director of Public Works or his/her duly authorized designee, drainage conditions require it. They may be required even though not shown on the approved construction plans. Design shall be as approved by the Director or Public Works or his/her duly authorized designee.

5.23.05 Culverts under New Streets

Culverts under streets shall be extended at least to the edge of the right-of-way of the street. Headwalls, paving, flared-ends, and/or riprap, adequate to prevent erosion, shall be provided at the ends of all culverts.

5.23.06 Retention and Detention Systems

Measures for the retention and/or detention and controlled release of stormwater runoff from the subdivision shall:

1. Not exceed the rate of runoff for the same site in its underdeveloped state for intensities and duration of rainfall as specified in Section 5.24.09;
2. Have the ability to retain and maximize groundwater recharge. Design of the storm water runoff control system shall give consideration to providing groundwater recharge; and
3. Require that all on site facilities be properly maintained by the owner so that they do not become nuisances. The city may require that a fence be installed around such facilities. All runoff control structures, whether dedicated to the City or not, shall be accessible at all times for City inspection. Where runoff control structures have been accepted by the City for maintenance, access easements shall be provided.

5.23.07 Drainage Design

All designs shall be based on the maximum ultimate development of the entire watershed as permitted by the Middletown Zoning Regulations, as amended. All bridges and culverts shall be designed such that the required head and backwater produced by the structure shall not cause the flooding of abutting property. The following guidelines shall be adhered to for storm drainage design:

1. Design: All storm drainage systems shall be designed in accordance with the design standards of Public Works;
2. Design Formula: All design formulas shall adhere to acceptable engineering practice, and the calculations and their method of derivation shall be shown in the material submitted as part of the final application. Drainage computations showing the following shall be submitted:
3. Plans showing the drainage area of the development;
4. Calculation showing the area, time of concentration, intensity, coefficient, flow, velocity, pipe size, and slope of each pipe length; and
5. Design criteria: All storm drainage facilities shall be designed based on the standards of the Department of Public Works; and
6. Rainfall intensity: Rainfall intensities used for storm drainage design shall be taken from the U.S. Weather Bureau "Rainfall Intensity-Duration Frequency Curves", as amended, for the New Haven rain gauge.
7. The drainage system within the street R.O.W. must be directly accessible to each and every lot fronting that street. A waiver for certain lots may be made by the Public Works Department when, in their opinion, it is feasible to do so.

5.23.08 Watersheds in Excess of One Square Mile

On watersheds one square mile or over, the design of culverts, bridges and through watercourses shall be based upon not less than a 100 year storm. On watersheds of less than one square mile, the design for the through drainage system shall be for not less than a 50 year storm.

5.23.09 Road Drainage System

The drainage system for roads, including catch basins, inlets, pipe, underdrains and gutters within or abutting the subdivision, shall be designed for not less than a 10-year storm.

5.23.10 Private Drains

Sufficient and adequate facilities shall be constructed on private lots wherever necessary to prevent the flow of surface drainage from the property the flow of surface drainage from property on which it originates onto adjacent property in sufficient quantity, concentration or velocity to cause damage or create nuisance on adjoining property.

1. The size and location of all private storm drains that connect to the City storm drain system shall be approved by the Department of Public Works prior to installation.
2. Rear yard drains and cellar or foundation drains that are connected to the storm drainage system must be shown on the final "as-built" plan of the drainage system.
3. When storm sewer construction precedes house construction, the piping shall be installed to a point within the lot not less than six (6) feet from the front property line.

2. Site Plan Review

Responsible Party: William Warner, Director of Planning, Conservation & Development

BMP Description:

All site plans shall be reviewed by the Planning, Conservation & Development Department and the Public Works Engineering Division for sedimentation and erosion controls. BMP's will be required where appropriate.

Activities:

Ongoing: The City's Subdivision Regulations state what a developer needs to submit for review and approval. Both stormwater quantity and quality BMP's are reviewed for each site, by both the Environmental Planner and the City Engineer.

3. Construction Inspection Program

Responsible Party: William Warner, Director of Planning, Conservation & Development
Thomas Nigosanti, City Engineer, Public Works Department

BMP Description:

Random inspections of construction sites will be performed by the Environmental Planner and/or the Wetlands Enforcement Officer to determine the overall compliance that is being achieved by construction operators.

Road construction projects will have regular inspection to verify compliance with plans.

Activities:

Section 4.05.02 Inspection and Enforcement of the City's subdivision regulations states that:

"The Zoning and Inland Wetlands Enforcement Officer (ZEO) and the Public Works Department shall make periodic inspections to ensure compliance with the approved plan and that control measures and facilities are properly performed or installed and maintained. Upon finding improper installation or maintenance, The City has the authority to require compliance to the plan and/or order the contractor/developer to stop work. The Commission may ask for progress reports from the developer and/or the Zoning Enforcement Officer. "

Inspections: City projects this year included:

Randolph Road:	State DOT inspection was provided.
Nejako Drive:	Daily inspection by Cardinal Engineering was provided.
Mt. Vernon Street:	Public Works inspected this project daily.
Francis Avenue:	Public Works inspected this project daily.
Melilli Plaza:	Public Works inspected this project daily.

Various private construction sites were also inspected.

Post-Construction Runoff Control

Post-construction stormwater management in new development and redevelopment.

Required throughout the municipality:

develop, implement, and enforce a program to address stormwater runoff from new development and redevelopment projects that disturb greater than or equal to one acre, including projects less than one acre that are part of a larger common plan of development or sale, that discharge into the MS4 or directly to waters of the State. This program shall ensure that controls are implemented to require develop and implement strategies which include a combination of structural and/or non-structural best management practices (BMPs) appropriate for your municipality; use an ordinance or other regulatory mechanism to address the elements of subsection (i) above regarding post-construction runoff from new development and redevelopment projects to the extent allowable under State or local law; and ensure adequate long-term operation and maintenance of BMPs.

Description:

The Phase II Final Rule requires an operator of a regulated small MS4 to develop, implement, and enforce a program to reduce pollutants in post-construction runoff to their MS4 from new development and redevelopment projects that result in the land disturbance of greater than or equal to 1 acre. The small MS4 operator is required to:

1. Develop and implement strategies which include a combination of structural and/or non-structural best management practices (BMPs);
2. Have an ordinance or other regulatory mechanism requiring the implementation of post-construction runoff controls to the extent allowable under State, or local law,
3. Ensure adequate long-term operation and maintenance of controls;
4. Determine the appropriate best management practices (BMPs) and measurable goals for this minimum control measure.

Details of BMPs

1. Water Quality & Quantity Review

Responsible Party: Thomas Nigosanti, City Engineer

BMP Description:

Water quality impacts are to be considered from the design stage of a project to determine appropriate BMP's to be required, to minimize water quality impacts; and attempt to maintain pre-development runoff conditions.

The planning process identifies the municipality's requirements concerning water quality and quantity controls, operation and maintenance policies and procedures, and enforcement procedures.

Education programs for developers and the public about project designs that minimize water quality impacts; and measures such as minimization of percent impervious area after development and minimization of directly connected impervious areas will be researched.

To ensure the appropriate implementation of the structural BMPs, pre-construction review of BMP designs; inspections during construction to verify BMPs are built as designed; post-construction inspection and maintenance of BMPs; and penalty provisions for the noncompliance with design, construction or operation and maintenance will be addressed.

Activities

Developer's Guide

On the City's website, under the Planning, Conservation and Development Department, there is an item called Developers Guide. This discusses the requirements of developers pertaining to stormwater runoff and sedimentation control.

Plan Review

Each development requires subdivision approval from the Planning and Zoning Commission. Some developments may also need Inland Wetlands Commission approval. Plans submitted must have a stormwater runoff control plan and a sediment and erosion control plan. These plans are reviewed for each specific site.

Inspection & Enforcement

Once a project is approved, a performance bond, and maintenance bond are required, along with regular inspection from the zoning enforcement officer, and the public works construction inspector.

Long Term Operation and Maintenance

The City's Public Works Department is responsible for the long term operation and maintenance of storm water improvements on new subdivisions.

Pollution Prevention/Good Housekeeping

Description:

Recognizing the benefits of pollution prevention practices, the rule requires an operator of a regulated small MS4 to:

1. Develop and implement an operation and maintenance program with the ultimate goal of preventing or reducing pollutant runoff from municipal operations into the storm sewer system;
2. Include employee training on how to incorporate pollution prevention/good housekeeping techniques into municipal operations such as park and open space maintenance, fleet and building maintenance, new construction and land disturbances, and storm water system maintenance. To minimize duplication of effort and conserve resources, the MS4 operator can use training materials that are available from EPA, their State, or relevant organizations;
3. Determine the appropriate best management practices (BMPs) and measurable goals for this minimum control measure.
4. Develop schedule for street sweeping and catch basin cleaning.
5. Develop a program to evaluate and repair outfalls and other drainage structures.

The Pollution Prevention/Good Housekeeping for municipal operations minimum control measure is a key element of the small MS4 storm water management program. This measure requires the small MS4 operator to examine and subsequently alter their own actions to help ensure a reduction in the amount and type of pollution that: (1) collects on streets, parking lots, open spaces, and storage and vehicle maintenance areas and is discharged into local waterways; and (2) results from actions such as environmentally damaging land development and flood management practices or poor maintenance of storm sewer systems. While this measure is meant primarily to improve or protect receiving water quality by altering municipal or facility operations, it also can result in a cost savings for the small MS4 operator, since proper and timely maintenance of storm sewer systems can help avoid repair costs from damage caused by age and neglect.

Details of BMPs

1. Develop Pollution Prevention Plan

Responsible Party: Thomas Nigosanti, City Engineer

BMP Description:

Create a Pollution Prevention Plan that includes the following:

1. Create and maintain SPPP for municipal property.
2. Train City employees according to the SPPP.
3. Create and simplify Waste Disposal Guidelines

Activities:

Prepare SPPP's

SPPP's have been prepared for the Recycling Center and the Public Works Maintenance Garage.

Training

The Public Works maintenance employees were shown a slide presentation called "*Keeping it Clean, Municipal Operations for Clean Water*". This presentation was developed by SEMCOG in partnership with the Southeast Michigan Partners for Clean Water.

Waste Disposal Guidelines

The City's website includes several items concerning the disposal of and recycling of various wastes. Listed on the website are electronics, cell phones, grass, sneakers, nickel cadmium batteries recycling.

There are also printed instructions available for paint disposal, bulky waste, and curbside recycling requirements.

2. Maintenance Schedule

Responsible Party: Salvatore Emanuele, Superintendent of Streets and Sanitation

BMP Description:

Finalize the maintenance plan and schedule that will be put in place for management of BMPs. Maintenance plan to include road sweeping schedule, catch basin cleaning schedule, and storm outlet maintenance.

Activities:

Street Sweeping

All of the streets are swept at least once each spring. Some streets that need it are swept a second time. Many streets in the downtown area are swept on a weekly basis.

Catch Basin Cleaning

Our catch basin cleaning contractor, H&B Catch Basin Cleaning, LLC, cleaned 950 catch basins this year. Our own forces cleaned additional basins when needed.

Storm Outlet Maintenance

A collapsed pipe was reported on Old Farms West, and after investigation, it appears that the outlet has been clogged for some time and the pressure build-up in the pipe caused water to flow out of the pipe joints causing several sink holes. The pipe was removed and replaced. A new flared end section was installed with rip-rap to prevent erosion.

3. Stormwater Management System

Responsible Party: Thomas Nigosanti, City Engineer

BMP Description:

The stormwater layer of the GIS will be used to track the inventory of stormwater facilities and outfalls. This system will be used by staff to schedule and perform inspections, maintenance activities and document any other actions taken on these inventory items.

Activities:

Digitize storm system plans

We have a new contract with UIC to scan all of our maps. They will digitize them and add the drainage to our GIS.

Add Drainage system to GIS Mapping

We have a new contract with UIC to scan all of our maps. They will digitize them and add the drainage to our GIS.

Schedule Inspections of outfalls

The remainder of outfalls in Section 1, (36 outfalls), will be inspected this winter.

Recommend maintenance of outfalls

A plan for maintenance and repair of drainage structures will be formulated after each section has been inspected.

**BMP Assignments by Responsible Party
Public Participation/Involvement**

Community Clean-ups	Various Parties
Stormwater Management Plan Update	Matt Dodge

Public Education and Outreach

Develop Educational Resources	Kim O'Rourke
-------------------------------	--------------

Illicit Discharge Detection and Elimination

Drainage Outlet Survey	Thomas Nigosanti
Illicit Discharge Ordinance	William Russo
Illicit Discharge Detection	Robert DeManche
Recycling Program	Kim O'Rourke
Sewer System Map	Thomas Nigosanti

Construction Site Runoff Control

Ordinance / Regulatory Mechanism	William Warner
Site Plan Review	Thomas Nigosanti
Construction Inspection Program	Thomas Nigosanti & William Warner

Post-Construction Runoff Control

Water Quality & Quantity Review	Thomas Nigosanti
---------------------------------	------------------

Pollution Prevention/Good Housekeeping

Develop Pollution Prevention Plan	Thomas Nigosanti
Maintenance Schedule	Salvatore Emanuele
Stormwater Management System	Thomas Nigosanti

CERTIFICATION

Signature Requirements

The Plan shall be signed by the chief elected official or principal executive officer, as those terms are defined in Section 22a-430-3(b)(2) of the Regulations of Connecticut State Agencies. The Plan shall be retained by the chief elected official or principal executive officer and copies retained by town officials or employees responsible for implementation of the Plan.

"I have personally examined and am familiar with the information submitted in this document and all attachments thereto, and I certify that, based on reasonable investigation, including my inquiry of those individuals responsible for obtaining the information, the submitted information is true, accurate and complete to the best of my knowledge and belief. I understand that a false statement made in this document or its attachments may be punishable as a criminal offense, in accordance with Section 22a-6 of the Connecticut General Statutes, pursuant to Section 53a-157b of the Connecticut General Statutes, and in accordance with any other applicable statute."

Mayor Daniel Drew
Chief Elected Official

Thomas Nigosanti, City Engineer
Preparer

Plan Review Fee

When submitting a Stormwater Management Plan as requested by the Commissioner in accordance with Section 4(f)(2)(A) each municipal permittee shall submit a plan review fee of \$187.50.

By January 1, 2005 and annually thereafter by January 1, the permittee shall submit an Annual Report to:

STORMWATER PERMIT COORDINATOR
BUREAU OF WATER MANAGEMENT
DEPARTMENT OF ENVIRONMENTAL PROTECTION
79 ELM STREET
HARTFORD, CT 06106-5127

The report shall include: A municipal plan review fee of \$187.50.