

# Ottawa County Water Resources Commissioner Stormwater Standards

Prepared for Macatawa Area Coordinating Council  
for use by Ottawa, Allegan and Muskegon Counties

November 13, 2015

---

FISHBECK, THOMPSON, CARR, & HUBER INC.



- **Introduction to Manual**
- NPDES MS4 Permit Requirements
- Process
- Stormwater Standards
- Best Management Practices (BMPs)

- **Preliminaries: Purpose, Authority, Applicability, Fees**
- **Part 1: Procedures for Plan Submission and Approval**
- **Part 2: Stormwater Management Requirements**
- **Part 3: Stormwater Design Criteria**

- Introduction to Manual
- **NPDES MS4 Permit Requirements**
- Process
- Stormwater Standards
- Best Management Practices (BMPs)

# Post-Construction Stormwater Runoff Program

- Ordinance or regulatory mechanism in effect
- Water quality treatment performance standard
- Source of rainfall data
- Channel protection performance standard
- Procedure to review use of infiltration BMPs
- Address stormwater “hot spots” (high risk land uses for accidental spill)
- Off-site mitigation and payment-in-lieu programs
- Site plan review procedure
- Long-term operation and maintenance

- Introduction to Manual
- NPDES MS4 Permit Requirements
- **Process**
- Stormwater Standards
- Best Management Practices (BMPs)

# Site Design for Stormwater

- Protect environmentally sensitive areas
- Reduce runoff using non-structural BMPs
- Manage stormwater runoff through water quality treatment, channel protection, and flood control (including provisions for emergency overflow)
- Size conveyance system
- Confirm an adequate outlet
- Incorporate pretreatment for infiltration BMPs
- Incorporate spill containment for stormwater “hot spots”
- Incorporate temperature reducing measures for coldwater streams
- Comply with Watershed Policy Statements (if any)
- Consider impacts from groundwater mounding (due to infiltration)
- Obtain soils information for design
- Design BMPs

# Under Jurisdiction of Drain Commissioner

- Plats
- Site Condominiums and other multi-lot developments with public roads (with agreement from county road commission)
- Other multi-lot developments with private roads when single sustainable entity responsible for operation and maintenance does not exist
  - Obtain necessary easements in name of drain district
  - Incorporate deed restrictions
  - Execute 433 or 425 agreement and accompanying documentation
  - Execute a maintenance agreement (only if association wants to assume maintenance responsibilities)



# Private Development

- Industrial/Commercial/Institutional
- Other multi-lot developments with private roads
- Drain Commissioner standards review
  - When requested by local unit (ordinance or resolution)
  - Provide easements as necessary
  - Incorporate deed restrictions
  - Execute a maintenance agreement with local unit

- Introduction to Manual
- NPDES MS4 Permit Requirements
- Process
- **Stormwater Standards**
- Best Management Practices (BMPs)

# Water Quality

<b>Water Quality</b> “first flush”	Treat the runoff generated from 1 inch of rain over the developed portion of the site (i.e. the 90% annual nonexceedance storm).  Treatment may be provided through settling (permanent pool or extended detention), infiltration, or filtration.
---------------------------------------	---

Designed to reduce post-development total suspended solids (TSS) loadings by 80%, or achieve a discharge concentration of TSS no greater than 80 mg/l

# Channel Protection

<b>Channel Protection</b>	<p>Retention: No net increase between the pre-development and post- development runoff volume and rate for all storms up to and including the 2-year, 24-hour rainfall event.</p> <p>OR, where site conditions preclude infiltration, an alternative approach may be allowed after all other onsite retention options are exhausted:</p> <p>Extended Detention: Store runoff from the 1-year, 24-hour storm for a period of 24 hours.</p>
---------------------------	---

Payment-in-lieu programs – NOT ALLOWED

Offsite Mitigation – allowed where site contributes to regional treatment area

Alternative Approach – LGROW presented to DEQ for acceptance

# Flood Control

<b>Flood Control</b>	<p>Collection and Conveyance: Design storm sewers and swales for the 10-year storm, and open channels for the 25-year storm.</p> <p>Detention: Store runoff from the 25-year storm with a maximum release rate of 0.13 cfs/acre. If retention of the total channel protection volume is provided, the maximum release rate may be increased to the pre-development 25-year peak runoff rate.</p> <p>OR</p> <p>Retention: Store and infiltrate runoff from the 25-year storm.</p> <p>Emergency Overland Flow Routes: Identify overland flow routes and the extent of high water levels for the 100-year flood to ensure no adverse impacts offsite or internal to the site. Where overland flow routes do not exist, detention/retention basins shall be increased in size to store a total of 2 times the flood control volume.</p>
----------------------	---

Why 25-year? What does maximum release rate look like?  
What probability storm is twice as large?

# Other Sensitive Areas

<b>Pretreatment</b>	BMPs: Forebay (minimum volume equal to 15% of water quality volume); Vegetated Filter Strip; Vegetated Swale; Water Quality Device.
<b>Hotspot</b>	Pretreatment BMP with impermeable barrier above groundwater and provisions for the capture of oil, grease, and sediments. Minimum spill containment volume: 400 gallons.
<b>Coldwater Streams</b>	Incorporate strategies to promote groundwater recharge and/or reduce temperature of surface discharge water.

- Introduction to Manual
- NPDES MS4 Permit Requirements
- Process
- Stormwater Standards
- **Best Management Practices (BMPs)**

# Non-Structural BMPs

- Minimize Soil Compaction and Total Disturbed Area
- Protect Natural Flow Pathways (including Riparian Buffers)
- Protect Sensitive Areas
- Native Revegetation
- Stormwater Disconnection



# Structural BMPs

- **Conveyance and Storage**
  - Storm Sewer
  - Culvert or Bridge
  - Open Channel
  - Detention Basin
  - Retention Basin
- **LID and Small Site**
  - Infiltration Practice
  - Bioretention/Rain Garden
  - Constructed Filter
  - Planter Box
  - Pervious Pavement
  - Capture Reuse
  - Vegetated Roof
- **Pretreatment**
  - Water Quality Device
  - Sediment Forebay
  - Spill Containment Cell
  - Water Quality Swale
  - Vegetated Swale
  - Vegetated Filter Strip
  - Level Spreader



# Questions and Discussion