

# **CITY UTILITIES DESIGN STANDARDS MANUAL**

**Stormwater  
SW12 Erosion Control**

September 2017

### SW12.01 – Purpose

The purpose of this Chapter is to:

1. Establish authority;
2. Outline the principles for the control of soil erosion and sediment for land disturbing activities during construction;
3. Identify resources for the development of a Stormwater Pollution Prevention Plan (SWPPP);
4. Provide guidance on appropriate Best Management Practices (BMP); and
5. Provide requirements specific to the City of Fort Wayne for SWPPP development, implementation, submittal, and review.

For acceptable erosion control materials, refer to [Chapter MA5 - Stormwater Materials and Testing Requirements](#).

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### SW12.02 – Authority

Title 327 IAC 15-13 (Rule 13) requires municipalities designated as Municipal Separate Storm Sewer Systems (MS4s) to facilitate plan review for erosion and sediment control on construction sites and to make their requirements at least as stringent as Title 327 IAC 15-5 (Rule 5). The City of Fort Wayne is designated an MS4 under Rule 13, thus requiring erosion and sediment control for land disturbing activities within its jurisdiction at least as stringent as Rule 5. The City has established processes for submittal, review, approval, inspection, and enforcement of construction site erosion and sediment control.

The purpose of Rule 5 as stated in Title 327 IAC 15-5.1 is:

*“... to establish requirements for stormwater discharges from construction activities of one (1) acre or more so that the public health, existing water uses, and aquatic biota are protected.”*

Land disturbing activities applicable under Title 327 IAC 15-5-2 shall comply with Rule 5 and the additional requirements outlined herein. [Exhibit SW12-1](#) provides submittal requirements for land disturbing activities within the jurisdiction of the City of Fort Wayne. Refer to Rule 5 for further definitions.

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### SW12.03 – Principles

The City of Fort Wayne requires implementation of the following principles at construction sites:

1. Reduce soil loss from all construction sites.
2. Improve the water quality of storm runoff from construction sites.
3. Prevent accumulation in water bodies of silt and debris originating from construction activity.
4. Prevent discharges of chemicals, chemical wastes and other pollutants.

5. Prevent migration of construction debris off site.
6. Prevent damage to properties adjacent to construction sites.
7. Protect “state waters”, wetlands, and other environmentally sensitive areas from damage.
8. Apply Low Impact Development (LID) practices for erosion and sediment control.

These principles shall be achieved by implementation of structural and non-structural BMPs in accordance with the regulatory and technical standards provided in Section SW12.04.

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#### SW12.04 - Regulatory and Technical Standards

The minimum regulatory standards that shall be followed include:

1. *Stormwater Runoff Associated with Construction Activity (“Rule 5”)* Indiana Administrative Code Title 327 IAC 15-5.

A copy of Rule 5 may be downloaded from the state’s website at [http://www.in.gov/legislative/iac/iac\\_title?iact=327](http://www.in.gov/legislative/iac/iac_title?iact=327).

2. *Stormwater Runoff Associated with Municipal Separate Storm Sewer System Conveyances (“Rule 13”)* (Title 327 IAC 15-13).

A copy of Rule 13 may be downloaded from the state’s website at [http://www.in.gov/legislative/iac/iac\\_title?iact=327](http://www.in.gov/legislative/iac/iac_title?iact=327).

3. *City of Fort Wayne Code of Ordinances* (Chapter 53, Section 53.70).

Chapter 53 may be reviewed in the City Clerk’s office, or downloaded from the City’s website at <http://www.cityoffortwayne.org/city-code.html>.

At a minimum, erosion and sediment control BMPs shall be designed, implement and maintained in accordance with:

1. *Indiana Stormwater Quality Manual*, October 2007, as amended (Indiana Department of Environmental Management, IDEM).

A copy of the manual may be downloaded from the state’s website at <http://www.in.gov/idem/4899.htm>.

2. City of Fort Wayne City Utilities Design Standard Manual Stormwater [Chapter SW11 - Stormwater Management](#).

Additional information on the development of Stormwater Pollution Prevention Plans (SWPPP) is available through the US Environmental Protection Agency at [http://water.epa.gov/polwaste/npdes/stormwater/upload/sw\\_swppp\\_guide.pdf](http://water.epa.gov/polwaste/npdes/stormwater/upload/sw_swppp_guide.pdf).

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#### SW12.05 - Best Management Practices

Construction site BMPs are required during all land disturbing activity until construction is completed and 70% of the permanent site ground cover is established. Construction site BMPs include not only erosion and sediment

control (*structural BMPs*), but also material management and site management. Construction site and material management and Low Impact Design (LID) are considered *nonstructural* BMPs. Several LID nonstructural techniques can be used on construction sites and are included in Figure SW12.1. The listed materials and techniques outline typical erosion control requirements for the majority of utility projects. When projects require additional erosion control methods refer to the *Indiana Storm Water Quality Manual*.

Figure SW12.1 provides information on the applicability and functions of typical construction site BMPs and categorizes them as nonstructural or structural. More detail on the BMPs can be found in the technical standards of this section, City Utilities Design Standards Manual Materials book or vendors for proprietary BMPs

Fort Wayne City Utilities has developed requirements which are specific to Fort Wayne and warrant attention in preparing and implementing SWPPPs. The following list comprises additional requirements for specific BMPs provided in Figure SW12.1, which are more stringent and/or more detailed than those found in Rule 5 or the technical standards.

1. A minimum 50 foot buffer.

Maintain a minimum 50 foot buffer along all water bodies except where bank or stream disturbance is necessary for construction, or access. Existing vegetation in the riparian buffer shall be protected to the maximum extent practicable. No staging or stockpiling is allowed in the riparian buffer. These restrictions are to be clearly indicated on the drawings and in specifications.

2. Site phasing.

Sites shall be "phased" in such a way that grading, construction, and stabilization are completed with each phase reaching an acceptable level of stabilization before grading begins on the next phase. Acceptable phased stabilization is achieved when the density of the vegetation cover has reached 70% cover. Streets shall be stabilized with the selected paving material or a temporary stabilization material as soon as possible after street profile has reached sub-grade elevations. These restrictions are to be clearly indicated on the drawings and in specifications.

Figure SW12.1 BMP Applicability and Function

BMP Description	Applicability	Function	
		Erosion Control	Sediment Control
<b>Nonstructural</b>			
<i>LID</i>			
Protect Critical Site Features	All sites	Yes	Moderate
Minimize Soil Compaction	All sites	Yes	Moderate
Protect Existing Trees	All sites	Yes	Moderate
Cluster Development	Multiple lots	Yes	Moderate
Preserving Existing Vegetation	All sites	Yes	Moderate
<i>Site and Material Management</i>			
Construction Phasing	All sites	Moderate	Moderate
Topsoil Salvage and Utilization	All sites	Yes	Yes
Good Housekeeping (multiple practices)	All sites	No	No
Temporary Construction Ingress/Egress Pad	All sites	Yes	Moderate
Concrete Washout Area	All sites	No	No
Street Sweeping	All sites	No	Yes
Contaminated Material Management	All sites	No	No
<b>Structural</b>			
Temporary Seeding/Mulching	All sites	Yes	No
Permanent Seeding/Planting	All sites	Yes	No
Post-Construction Structural Controls for Construction Sediment Control	All sites	No	Yes
Inlet Protection	All sites	No	Yes
Perimeter Control, including silt fence	All sites	No	Yes
Water Bars	All sites	Yes	Moderate
Erosion Control Blanket	Steep slopes	Yes	No
Temporary Diversions	Steep slopes or high flow	Yes	No
Turf Reinforcement Mat	Steep slopes	Yes	No
Rip Rap Slope Protection	Steep slopes	Yes	No
Permanent Diversions	High flow	Yes	No
Perimeter Diversion Dikes	High flow	Yes	Moderate
Grass Lined Channels	High flow	Yes	Moderate
Rip Rap Lined Channels	High flow	Yes	Moderate
Soil Roughening	High flow	Yes	No
Temporary Slope Drains	High flow	Yes	No
Sediment Traps	On-site waters	No	Yes
Check Dams	On-site waters	Yes	Moderate
Temporary Stream Crossing	On-site waters	Yes	No

### 3. Topsoil Stockpiling

Drawings and specifications are to state that when grading begins, topsoil shall be stockpiled for redistribution on the site. The goal is to place original organic materials and growth nutrients where it can best be used to establish a good seedbed for re-vegetation operations. Soil stockpiles that will remain for more than 30 days or are close to existing receiving waters shall have perimeter containment measures installed prior to beginning stockpile construction, and require stabilization within 15 days of stockpile construction. All proposed stockpile areas shall be shown on the SWPPP.

4. Site Management

Drawings and specifications are to state that sites shall be designed with specific areas set aside for management of: spill prevention, material use, delivery, and storage, solid waste, sanitary waste, and vehicle & equipment fueling, maintenance, and cleaning to minimize the contact between stored materials and rainfall or runoff. The fueling and maintenance area shall have a berm or other form of secondary containment.

5. Temporary Construction Entrance

A temporary construction entrance is to be located and shown on the drawings. A temporary construction entrance is to use a nonwoven geotextile for the separation of subbase and base aggregate materials.

A. Non-Woven Geotextile Fabric

Non-woven geotextile fabric for use in temporary construction entrances are to conform to the minimum requirements as indicated in [Chapter MA5 - Stormwater Materials and Testing Requirements](#).

6. Street Maintenance

Drawings and specifications are to state that adjacent public streets and streets associated with the project shall be kept clean, accumulating dust, sediment, and tracking from the site shall be removed.

Street sweeping of adjacent public streets shall be conducted a minimum of twice per week. Site operators shall inspect streets daily to evaluate if additional sweeping is required. Sweeping shall be conducted by the close of that business day (and during the day as needed) when sediment and other materials are tracked or discharged onto streets. Street sweepers using water while sweeping are preferred in order to minimize dust. Flushing off paved surfaces with water is prohibited.

7. Concrete Washout Area

The Engineer is to select the location of and design the requirements for the concrete wash out area based on the site and construction conditions. Pit or bermed washout areas and prefabricated concrete washout system are both allowed. Pit or bermed washout areas are to be lined with a ten-mil polyethylene lining.

8. Contaminated Material Management

The Engineering shall specify additional measures for contaminated material management and groundwater remediation where there is known contamination by toxic, radioactive, or other hazardous materials.

9. Bank and Pipe Stabilization

Drawings and specifications are to require pond banks and inlet/outlet pipes shall be stabilized within one week of pond installation. Stabilization shall include, at a minimum, erosion control blanket on the slopes of the pond extending 5-feet past the top of bank and appropriate stabilization of the inlet/outlet pipe.

10. Detention and Post Construction Water Quality BMP Sequencing

Drawings and specifications for sites that will have detention and post construction water quality BMPs shall install the water quality BMPs early in the construction build-out of the site so that detention areas are protected from sedimentation. Projects that are using underground detention are required to install a SQU as a means of treating potentially polluted stormwater prior to entering the detention structure.

11. Inlet Protection

Inlet protection is required on all existing or proposed storm sewer inlets in the vicinity of the construction site that may receive site runoff. Vehicle and pedestrian traffic safety shall be considered when selecting inlet protection BMPs. Four types of inlet protection are preferred: geotextile fabric, sediment control sack, stone bags and filter socks. The selected BMP shall be appropriate to the type of storm inlet and ground surface at the inlet. Specifications are to require Inlet protection cleaning at minimum every two weeks.

a. Geotextile Fabric for Inlet Protection

Geotextile fabric inlet protection may be used at existing and new storm sewer inlets where the immediate area surrounding the inlet is not paved. The structure shall have a height 12-inches to 18-inches above the top of the inlet and a maximum post spacing of 36-inches. The geotextile fabric shall meet the minimum requirements of [Chapter MA5 -Stormwater Materials and Testing Requirements](#).

b. Sediment Control Sack for Inlet Protection

Sediment control sack inlet protection may to be specified at existing and new inlets and catch basins where the immediate area surrounding the inlet and/or catch basin is paved. The Engineer shall specify proprietary devices providing a minimum filtering efficiency of 80% of Total Suspended Solids. Sediment control sacks shall not slow runoff into the structure such that ponding occurs in traveling lanes of a street.

c. Stone Bags for Inlet Protection

Stone bags for inlet protection may be specified at existing and new drop inlets and curb inlets in both paved and unpaved areas. Bags are to be construction of nonwoven geotextile fabric and used

INDOT #5 washed aggregate gravel. The aggregate size must be larger than the storm sewer grate openings.

d. Filter Sock for Inlet Protection

Filter Sock for inlet protection may be specified for inlets with a drainage area of 1 acre or less. Filtrexx Inlet Protection is the preferred manufacturer but other 'or-equal' manufacturers may be considered. Filter socks shall meet for exceed the minimum requirements of [Chapter MA5 - Stormwater Materials and Testing Requirements](#).

e. Sediment Traps of Inlet Protection

Sediment traps for inlet protection may be specified for inlets with drainage areas of 5 acres or less. Sediment traps are to be constructed of compacted embankment.

- A nonwoven geotextile fabric meeting or exceeding the minimum requirements [Chapter MA5 - Stormwater Materials and Testing Requirements](#) shall be used to separate the embankment and the aggregate materials.
- Aggregate shall be as defined by INDOT Standards for revetment riprap, must be crushed stone and must meet the gradation requirements of [Chapter MA5 - Stormwater Materials and Testing Requirements](#). The preferred material for the Subbase Aggregate is INDOT #5 aggregate. However, if INDOT #5 is not available, INDOT #8 may be used.

12. Temporary Perimeter Protection - Silt Fence

Woven geotextile fabrics are to be used for silt fence sediment barriers. Silt fences may be either standard strength or extra strength as determined by the Engineer. Woven geotextile fabrics specified must meet the requirement of [Chapter MA5 - Stormwater Materials and Testing Requirements](#).

13. Temporary Perimeter Protection – Filter Sock

Filter Socks are to be biodegradable material containing a coarse composted material. Filtrexx Sediment Control Soxx is the preferred manufacturer but 'or equals' can be considered. The Engineer is to specify the diameter and material of the Filtrexx Sediment Control based on the manufacturer's design tool. [Chapter MA5 - Stormwater Materials and Testing Requirements](#) provide the range of product options.

14. Sediment Control Dewatering Bag

A temporary sediment control dewatering bag shall be specified at the discharge point of all dewatering pipes and hoses. Dewatering bags shall be proprietary devices providing a minimum removal efficiency of 80% of Total Suspended Solids. Dewatering bags are to be made of a nonwoven geotextile fabric meeting or exceeding the minimum requirements for

materials and be constructed specifically for the purposes of sediment control from dewatering pipes and hoses.

#### 15. River / Lake Shore Protection

Coir logs may be specified to provide river and/or lake shore protection. Coir logs can be specified with or without erosion control blankets. The Engineer shall designate the installation requirements. If erosion control blankets are required, long-term erosion control blankets shall be used.

Coir logs can be specified as vegetated or non-vegetated installations. The Engineers shall designate the installation requirements. If vegetated installation is required, planting requirements shall also be specified.

Required spacing is dependent on site conditions and the river and/or lake shore bank slope. The Engineer shall designate the installation spacing and other requirements necessary for an effective installation.

#### 16. Erosion Control Blankets.

Erosion control blankets are required on all slopes of 4:1 or steeper.

Erosion control blankets used on areas with a slope of 2:1 or less are to be defined as short-term or long-term based on intended installation. Short-term blankets are intended for installations of less than six months and long-term blankets are required for installations of 6 to 12 months. The Engineer is to designate the type of erosion control blanket required for each installation and/or area.

Additional requirements beyond the minimum requirements listed in this section shall be required for slopes exceeding 2:1 and/or for installations with a functional longevity of more than 12 months.

##### A. Short-term Erosion Control Blankets

Erosion control blankets with a functional longevity of 6 months or less are defined as short-term erosion control blankets. Short-term Erosion Control Blankets are to have the minimum requirements listed in [Chapter MA5 - Stormwater Materials and Testing Requirements](#).

##### B. Long-term Erosion Control Blankets

Erosion control blankets with a functional life exceeding 12 months are defined as long-term erosion control blankets. Blankets are to meet the minimum requirements listed in [Chapter MA5 - Stormwater Materials and Testing Requirements](#).

#### 17. Straw bales

Straw bales shall not be utilized in areas of concentrated flow, as check dams, or as perimeter protection.

18. Temporary Rock Check dams

Rock check dams shall be made of subbase and base aggregate separated by a nonwoven geotextile fabric. All temporary rock check dams not intended as permanent post-construction measures shall be removed following construction and site stabilization.

A. Nonwoven Geotextile Fabric

Nonwoven geotextile fabric for use in temporary rock check dams shall meet or exceed the minimum requirements of [Chapter MA5 - Stormwater Materials and Testing Requirements](#).

B. Aggregate and Base Aggregate Materials

Aggregate shall be as defined by INDOT Standards for revetment riprap, must be crushed stone and must meet the gradation requirements of [Chapter MA5 - Stormwater Materials and Testing Requirements](#).

The preferred material for the base aggregate is INDOT #5 aggregate. However, if INDOT #5 is not available, INDOT #8 may be used.

19. BMP Operation and Maintenance Manual

Construction site BMPs that will remain after construction is complete shall require development of an Operation and Maintenance Manual.

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**SW12.06 - Stormwater Pollution Prevention Plan (SWPPP)**

The SWPPP is a plan developed to minimize the impact of stormwater pollutants resulting from construction activities. At a minimum a SWPPP should communicate and satisfy the following:

- Identify all potential sources of pollution which may affect the quality of stormwater discharges,
- Describe the practices to be used to reduce the pollutants in the stormwater discharges associated with construction activity including the installation, implementation and maintenance requirements,
- Be prepared in accordance with good engineering practices, Rule 5, and City of Fort Wayne erosion and sediment control requirements; and
- Be updated throughout construction and stabilization of the site.

1. SWPPP Submittals and Approvals

Persons preparing construction plans subject to Rule 5 are encouraged to prepare a Conceptual SWPPP for review at the pre-planning meeting ([Chapter SW11 - Stormwater Management](#)). The Conceptual SWPPP shall provide sufficient information for Fort Wayne City Utilities to identify potential problem areas (“red flags”) and determine whether or not the conceptual plan has the potential to comply with this Section.

The plan preparer shall prepare the following for the pre-planning meeting:

- a. [Exhibit SW12-2](#) Basic Submittal/Stormwater Red Flags
- b. [Exhibit SW12-4](#) Application for SWPPP Permit

The Final SWPPP must include detailed provisions for erosion and sediment control during construction, and detailed provisions for post-construction stormwater and sediment control. The preparer shall utilize the following documents for Final SWPPP preparation and submittal.

- a. [Exhibit SW12-3](#) Guidance document for SWPPP Submittal
- b. [Exhibit SW12-4](#) Application for SWPPP Permit
- c. [Exhibit SW12-5](#) SWPPP Technical Review and Comment Form
- d. [Exhibit SW12-6](#) Site Plan Routing Review Checklist
- e. [Stormwater Management Concept Plan Review Checklist](#)

A copy of the checklist shall be filled out for each construction project submitted for review. The location of each element listed on the checklist shall be referenced in the checklist to facilitate efficient plan review. City Utilities will review plan submittals for compliance with Section SW12.04 Regulatory and Technical Requirements.

The SWPPP shall have two parts: a construction plan and a post-construction plan. In addition to the construction plan discussed in this Section, the SWPPP submittal shall meet the requirements for the post construction stormwater pollution prevention plan provided in Rule 5 under 327 IAC 15-5-6.5(a)(8) and Form II-5-2 SWPPP Technical Review and Comment Form. Post-construction measures shall meet the requirements of [Chapter SW11 - Stormwater Management](#).

## 2. Amending an Existing SWPPP

Because active construction is considered dynamic in nature, BMP selection, modification, and SWPPP revision and amendment shall be conducted to ensure the suitability and effectiveness of BMPs and to mitigate erosion potential, sediment migration, and reduce site specific pollution. Changes made prior to construction shall be submitted to City Utilities for review. Changes discussed with Fort Wayne City Utilities and determined by Fort Wayne City Utilities to be minor may require only notification. Changes to the nature or location of BMPs shall be updated on construction plans during construction and a current SWPPP shall be maintained on site.

## 3. SWPPP Procedural Steps

Basic procedural steps from plan preparation through submittal, review, and approval, and construction and post-construction stormwater management are included below. These procedures should be

supplemented with the detailed guidance and requirements in this Section.

- a. Review Technical and Guidance Documents.

It is recommended that this section and documents referenced in Section SW12.04 be reviewed prior to SWPPP preparation.

- b. Prepare the SWPPP.

It is strongly recommended that the project site owner prepare a conceptual SWPPP for review at the pre-planning meeting as described in [Chapter SW11 - Stormwater Management](#). A final SWPPP shall be prepared for all projects subject to Rule 5. The final SWPPP must be prepared in accordance with this Section and all other applicable regulations.

- c. Submit the SWPPP for review.

SWPPPs shall be submitted to City Utilities or through the City's formal plan routing and review procedures. The SWPPP submittal must include the completed forms.

- d. Receive plan approval from the City and other agencies.

All aspects of each plan, including the SWPPP, must be approved by all agencies before construction can begin. If at any point following this step, any changes are made to the SWPPP, City Utilities must be notified.

- e. Submit a Rule 5 Notice of Intent ("NOI") (Title 327 IAC 15-5-6).

The project site owner must complete the NOI in accordance with Rule 5, submit the NOI and supporting documents to IDEM, and submit a copy of the NOI and supporting documents to Fort Wayne City Utilities a minimum of 48 hours prior to initiation of land disturbing activities.

- f. Notify IDEM and the City Utilities of pending construction.

The project site owner must notify IDEM of the actual start date within 48 hours of starting land disturbing activities, and must notify City Utilities a minimum of two working days (48 working-day hours) prior to the start of construction.

- g. Begin construction.

The project site owner must implement, install, operate and maintain the erosion and sediment control BMPs in accordance with the approved SWPPP. During construction, revisions to the plan and changes at the construction site should be made as necessary to prevent pollutants, including sediment, from leaving the site. A current SWPPP must be maintained on site.

- h. Inspect erosion control measures (Title 327 IAC 15-5-10).  
The site operator must conduct inspections weekly and following rain events pursuant to Rule 5.
- i. Complete construction and submit a Rule 5 Notice of Termination (NOT) (Title 327 IAC 15-5-8).  
The project site owner must prepare and submit an NOT and supporting documents to IDEM, and provide a copy to City Utilities in accordance with Rule 5.
- j. Implement and maintain post-construction stormwater controls.  
The individual lot owner is responsible for inspecting and maintaining post-construction stormwater control structures and practices that were approved in the SWPPP and drainage review.

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### SW12.07 - Inspections

Self- inspections to evaluate the performance and condition of construction site BMPs shall be conducted in accordance with Rule 5 (Title 327 IAC 15-5-7(b)(18)). [Exhibit SW12-7](#) Construction Site Inspection Report shall be completed. Inspection records shall be kept on site for review by Fort Wayne City Utilities, representatives of the City of Fort Wayne, IDEM, Allen County SWCD, and other regulatory agencies.

BMPs with compromised performance shall be repaired or replaced immediately. When compromised BMPs cannot be fully restored immediately, efforts to temporarily repair BMPs or suspend work in the affected portion of the site shall be made at the end of each work day to prevent compromised BMPs from causing excessive erosion and sedimentation. Any BMP improvements that are in process shall be noted on the inspection report.

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### SW12.08 – Enforcement

Enforcement shall be consistent with the City of Fort Wayne Code of Ordinances and may include stop work orders, suspension of access to the stormwater drainage system, remediation conducted by the City and billed to the project owner, and civil penalties and fines.