

Stormwater Program Stakeholder Update #2



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Why are we meeting today?



To get familiar with Topeka's proposed
POST-CONSTRUCTION stormwater
regulations and resources

- **Stormwater BMP Design**
 - TMC Chapter 13.35 (*revised*)
 - Stormwater BMP Design Handbook (*new*)
- **Stormwater BMP Maintenance**
 - TMC Chapter 13.40 (*new*)
 - BMP Owner's Manual (*new*)
- **Stream Buffers**
 - TMC Chapter 13.10 (*revised*)
- **Floodplain Management**
 - TMC Chapter 17.10 (*revised*)

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Goals for SW Ordinance change



- Comply with the NPDES Phase 1 Municipal Stormwater Permit and EPA audit findings
 - Require stormwater quality treatment at new developments and redevelopments ≥ 1 acre
 - Requirements for municipal design plan review, construction, and maintenance processes
- Align and integrate stormwater quality and quantity designs
- Flexible, familiar, and locally relevant

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Stormwater BMP Design



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Design Regs & Resources

Topeka Municipal Code

- **TMC 13.35 Stormwater Management** – regulates permanent stormwater quality BMPs and detention/retention design and construction

Design Criteria & Drafting Standards

- Drainage system design (i.e., inlets, pipes, channels, culverts)
- Detention/Retention basin design
- Design plan preparation and submittal requirements
- Erosion and sediment control practices

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Stormwater BMP Design Handbook

- Design requirements for stormwater quality BMPs
- **Detention/Retention basin design**
- **Design plan preparation and submittal requirements**


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Stormwater Management Ordinance

TMC Chapter 13.35

Establishes **core requirements** for stormwater BMP design & const.




CONTENT:


- Applicability of ordinance and sw quality & quantity performance standards
- Criteria for Exemptions & Waivers
- General design conditions
- Stormwater Management Plan (SWMP)
- During Construction
 - Adhere to approved plan
 - Maintain constructed BMPs
- Construction Termination
 - Stormwater BMP Record Drawing
 - Final Inspection

DOES NOT INCLUDE:

- Technical detail on performance stds.
- Calculation methods, design specifications, design parameters
- A list of required elements for SWMPs and BMP Record Drawings



Refers to the Stormwater Design Handbook for all the above



New to you!

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Stormwater BMP Design Handbook

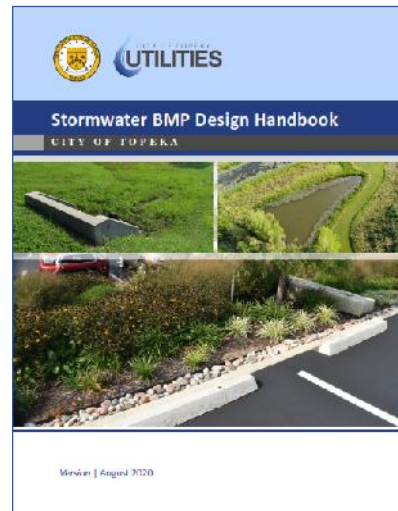


Chapters

1. Introduction
2. Design Process & Plans
3. SW Quality Design
4. SW Quantity Design
5. LID Techniques

Appendices

- A. Acronyms & Definitions
- B. SWMP checklist
- C. Required Forms
- D. BMP Record Drawing checklist
- E. BMP Certification Statement
- F. BMP Design Procedure Forms



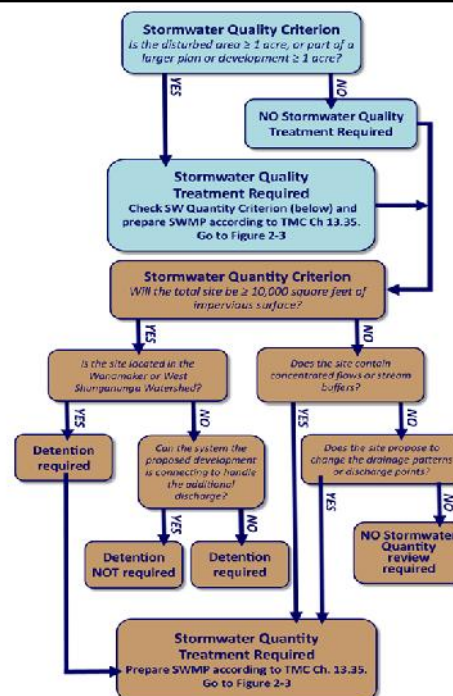
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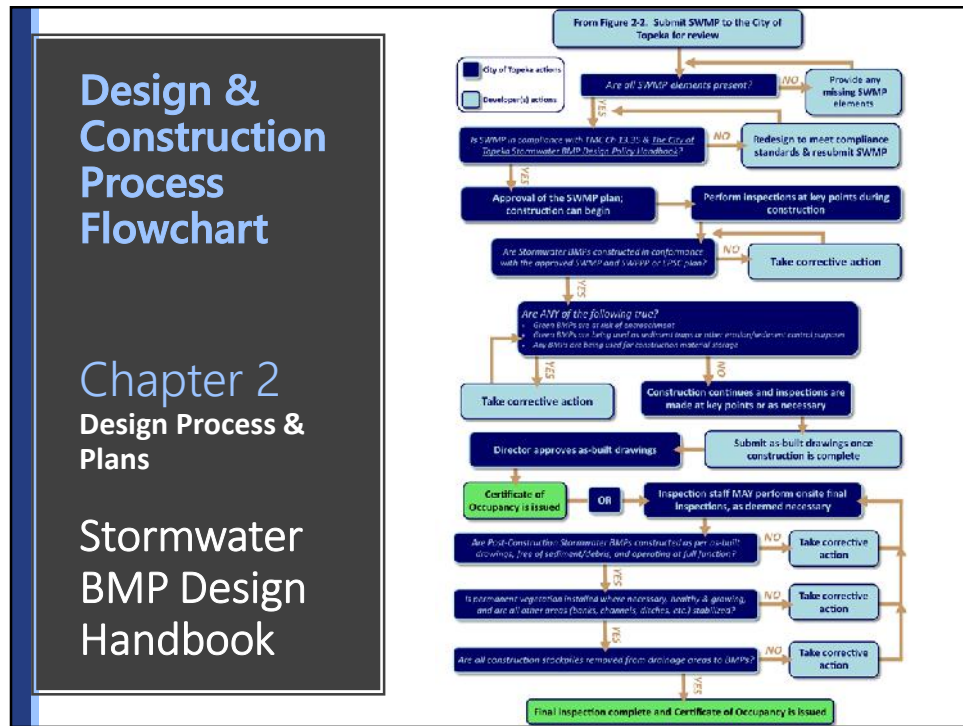
Project Applicability Flowchart

Chapter 2 Design Process & Plans

Stormwater BMP Design Handbook



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Stormwater Management Plan Reqmts.

Chapter 2
Design Process & Plans

Stormwater BMP Design Handbook


- Plan prep requirements
- Checklist in appendix
- Example plan sheets
 - BMP location map for O&M subplan
 - BMP Planting subplan

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Construction Termination Process

Chapter 2 Design Process & Plans

Stormwater BMP Design Handbook



- New to Topeka
- Targeting:
 - BMP construction per approved SWMP
 - BMP cleanliness and readiness to function properly as **PERMANENT INFRASTRUCTURE**
- Includes:
 - Stormwater BMP Record Drawing
 - Final inspection

The future property owner is responsible for BMPs once construction is finished.

These steps confirm the BMPs are clean and functional for the future Owner.


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Stormwater BMP Record Drawing

Chapter 2 Design Process & Plans

Stormwater BMP Design Handbook



- Checklist in appendix
- Some items will come from SWMP
(if no changes during construction)
- Includes:
 - BMP/easement location maps
 - Certifications/Agreements
 - As-Built Plan
 - BMP Planting Plan

Excerpt from the Stormwater BMP Record Drawing Checklist

2. CERTIFICATIONS, LEGAL DOCUMENTS, AND AGREEMENTS

- a. Signed original Engineers and Landscape Architects certification statement (see Appendix D)
- b. If applicable, signed originals of any other legal agreements or certifications pertaining to the stormwater BMPs or stormwater conveyance system (e.g., agreement with downstream property owner for use of offsite BMPs or drainage easements, etc.)
- c. Copy of recorded plat with accurate description of constructed stormwater BMPs, their stormwater management easements, and all other easements. Plats must include statement: **"Stormwater BMPs shall be maintained in accordance with TMC Chapter 13.40."**


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**Stormwater
Quality
content**

Chapter 3
**Stormwater
Quality Design**

**Stormwater
BMP Design
Handbook**



WHAT IS REQUIRED

- Performance Standard and General Policies

HOW TO DESIGN BMPs

- Encouragement for LID
- Guidance on Green Infrastructure BMPs
- Policies and Guides for Infiltration BMPs
- Policies for Vegetated BMPs
- Guidance for BMP Selection, Location, and Protection
- Aligning Quality & Quantity Designs
- Intro to Green Street Design


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**Performance
Standards &
Related Info**

Chapter 3
**Stormwater
Quality Design**

**Stormwater
BMP Design
Handbook**



- Requires the Level of Service Method
- Refers to MARC Manual for
 - LOS Calculation Method/Policies
 - BMP Design Specifications
- Emphasizes Green Infrastructure




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Policies for Infiltration BMPs

Chapter 3 Stormwater Quality Design

Stormwater BMP Design Handbook



➤ Infiltration BMP feasibility criteria

- For BMPs without an underdrain

SITE FEASIBILITY CRITERIA	YES	NO
1. Is the BMP located in soil characterized by a type "D" soil Hydrologic Soil Group?	<input type="checkbox"/>	<input type="checkbox"/>
2. Is the BMP located more than 100 feet from a drinking water supply well in a sensitive aquifer or more than 50 feet from a drinking water well in a non-sensitive aquifer?	<input type="checkbox"/>	<input type="checkbox"/>
3. Is there more than three (3) feet of separation distance from the bottom of the BMP to the elevation of the seasonally saturated soils or the top of bedrock?	<input type="checkbox"/>	<input type="checkbox"/>
4. Is the BMP located more than 1,000 feet up-gradient, or 100 feet down-gradient of active karst features?	<input type="checkbox"/>	<input type="checkbox"/>
5. Is the BMP located more than 10 feet away from a building or structure? <i>If no, a groundwater mounding analysis that confirms the building or structure will not be impacted by the BMP must be provided.</i>	<input type="checkbox"/>	<input type="checkbox"/>
6. Is the BMP located more than 35 feet of a septic drainfield? <i>If no, a groundwater mounding analysis that confirms the drainfield will not be impacted by the BMP must be provided.</i>	<input type="checkbox"/>	<input type="checkbox"/>
7. Does a groundwater mounding analysis confirm that a mound formed beneath the BMP will not extend into the BMP?	<input type="checkbox"/>	<input type="checkbox"/>
8. Is the BMP located more than 200 feet from the toe of a slope that is greater than or equal to 20 percent?	<input type="checkbox"/>	<input type="checkbox"/>
9. The BMP must not receive stormwater discharges from a stormwater hotspot (e.g. vehicle fueling yard, brownfield, etc.) or area of known soil contamination.	<input type="checkbox"/>	<input type="checkbox"/>


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Policies for Vegetated BMPs

Chapter 3 Stormwater Quality Design

Stormwater BMP Design Handbook



➤ BMP Planting Plan requirement

➤ Refers to MARC Manual

- Native species encouraged by not mandatory except when specified by MARC Manual

➤ List of plant resources

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Landscape Credits

Chapter 3 Stormwater Quality Design

Stormwater BMP Design Handbook



- Available for certain BMPs
- Maximum credit of 20%


BMP Type	Landscape Credit (see TMC Chapter 18.235.090)
VEGETATED BMPs¹	
Native Vegetation Established or Preserved	20%
Rain Garden	
Bioretention	
Vegetated Filter Strip	
Native Vegetation Swale	
Grass Vegetation Swale ²	10%
BMPs THAT REDUCE IMPERVIOUS AREA	
Green Roof	10%
Pervious Concrete	
Porous Asphalt	
Modular Concrete Block	
Cistern	
INFILTRATION BMPs	
Infiltration Basin	10%
Infiltration Trench	
DETENTION BMPs¹	
Extended Wet Detention	10%
Extended Dry Detention ²	

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BMP Selection, Location, and Protection Guidance

Chapter 3 Stormwater Quality Design

Stormwater BMP Design Handbook



- Guidance only
- Goal is to **eliminate BMP failures** from:
 - improper BMP selection
 - poor BMP location
 - a lack of protection of key components

Stormwater Quality BMP	Value Rating	Land Use of Project or Areas Within a Project								
		Com- mercial	Indus- trial	Parking Lots	Roadside & Medians	Roadways Travel- ways	Parks & Open Space	Residential		
							SFR Indiv. Lots	SFR Common Lots	Multi- Family Res.	
Native Veg. Preserved or Estab.	9.25	●	●	●	●	✖	●	○	○	○
Rain Garden	9.0	●	●	✖	○	✖	●	○	●	●
Infiltration Basin	9.0	●	●	○	●	✖	●	✖	●	●
Infiltration Trench	9.0	●	●	○	●	✖	●	✖	●	●
Bioretention	8.5	●	●	●	●	✖	●	○	●	●
Pervious Concrete	7.5	●	○	●	●	○	●	○	●	●
Porous Asphalt	7.5	●	○	●	●	○	●	○	●	●
Mod. Concrete Block	7.5	●	○	●	●	○	●	○	●	●
ED Wetland	7.0	●	●	○	○	✖	●	✖	○	○
Surface Sand Filter	6.0	●	●	○	●	✖	●	✖	●	●

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Stormwater Quantity Content

Chapter 4 Stormwater Quantity Design

Stormwater BMP Design Handbook



WHAT IS REQUIRED

- Watershed-based Performance Standards

HOW TO DESIGN STORAGE BMPs

- General Criteria
- Criteria specific to detention or retention BMPs
- Computational requirements and methods

Most of the design criteria
come from APWA manuals used
by KC-Metro.


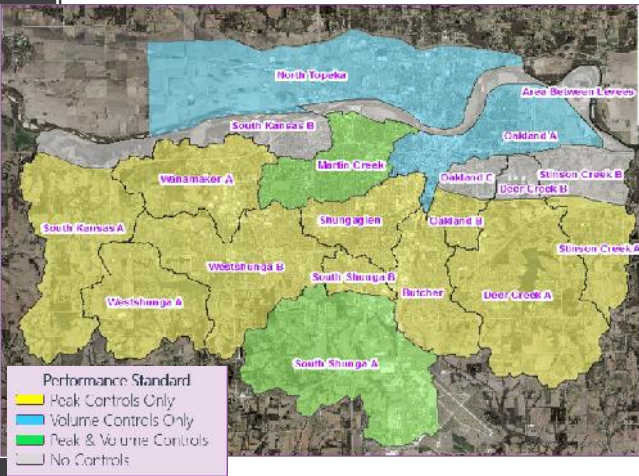
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Watershed- based Perf. Standards

Chapter 4 Stormwater Quantity Design

Stormwater BMP Design Handbook

Performance Standard
 Peak Controls Only
 Volume Controls Only
 Peak & Volume Controls
 No Controls


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Watershed-based Perf. Standards

Chapter 4
Stormwater
Quantity Design

Stormwater
BMP Design
Handbook

**Peak Flow Control Standard**

- Post peak \leq Pre peak
- 2, 5, 10, 25, 50, and 100-yr storms

Volume Control Standard

- No discharge of the volume from the 100-yr storm
- The volume captured by Green Infrastructure BMPs can count towards this requirement

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Stormwater BMP Maintenance


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Stormwater BMP Maintenance Ordinance

TMC Chapter 13.40

Establishes **core requirements** for inspection & maint. by **owners**.



CONTENT:

- Applicability
- Owner responsibilities
- Authority for City inspections of BMPs
- Prohibited uses and activities

DOES NOT INCLUDE:

- How to inspect a BMP
- How to maintain a BMP

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Refers to the BMP Maintenance Manual for all the above

New to you!

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BMP Maintenance Ordinance & Manual

What's important about this to Developers & Site Designers?

- Chapter 13.40 is relevant to the property OWNER. This may be the developer.
- The Manual should be used by the designer to develop the O&M Plan

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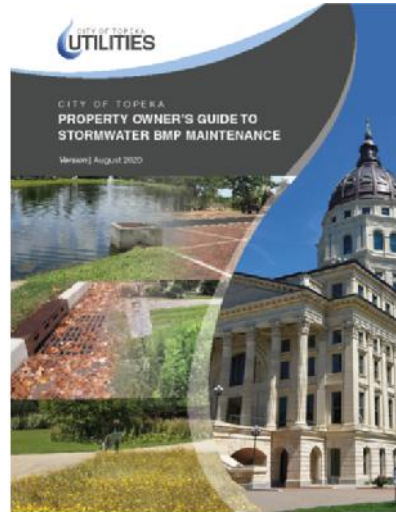
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BMP Maintenance Manual



➤ Property Owner's Guide to Stormwater BMP Maintenance

- Quick overview
- What is valuable to you?
 - O&M Plan resources



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BMP Maintenance Manual



Section 1: Introduction and Storm Water BMPs 101

Section 2: BMP Operational and Success Criteria

Section 3: BMP Inspection

Section 4: BMP Maintenance

Section 5: Individual BMP Inspection Requirements

Section 6: Helpful Resources



Target Audience:

NOT written for **engineer or designer**
IS written for **property owners**

Messaging:

- ✓ Simple
- ✓ Educational
- ✓ Visual
- ✓ Themed

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Section 5 Individual BMP Inspection Requirements

Best Management Practices (BMPs)	Basic Definition	Photo
Vegetated BMPs		
Non-Structural BMP	<p>Non-structural solutions for stormwater management include BMPs that rely on natural soil, vegetation and hydrologic conditions to reduce stormwater runoff, filter contaminants and improve water quality. These BMPs differ from the natural structure BMPs in that they are not engineered specifically in a ditch, channel, or other stormwater conveyance structure but can be used in conjunction with the below BMPs.</p>	
Bioretention	<p>Bioretention areas are built as basins, earthen areas that do not use plants and soil to catch stormwater from surrounding property. The water seeps into the soil and the bacteria in the soil. Bioretention areas are typically located in the rain gardens and have engineered soil, overflow structure (perforated) and underdrain system.</p>	
Rain Garden	<p>Rain gardens are small landscaped areas planted with a variety of native trees, shrubs, and plants. They catch runoff from stormwater by letting the water soak into the ground. The difference between rain gardens and bioretention areas is that rain gardens are typically smaller and don't have an engineered overflow structure (perforated) or underdrain system.</p>	

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Bioretention Example

➤ 2 Page Fact Sheet

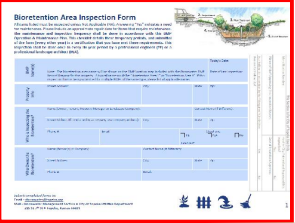
- BMP Overview
- Specific owner requirements
- Regular Maint. Activity


➤ Inspection Form

- 4-5 page checklist
- Available for BMP Stormwater Record Drawing

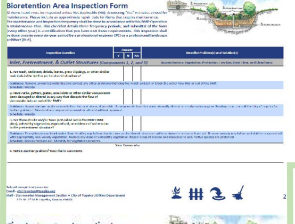
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Bioretention Example

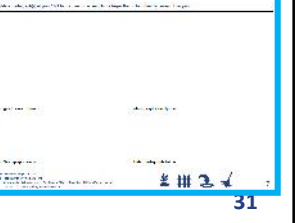






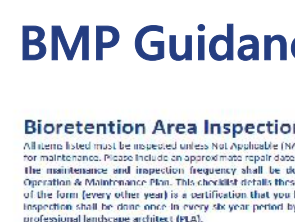







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BMP Guidance and Inspection

Bioretention Area Inspection Form

All items listed must be inspected unless Not Applicable (NA). Answering "Yes" indicates a need for maintenance. Please include an approximate repair date for items that require maintenance. The maintenance and inspection frequency shall be done in accordance with this BMP Operation & Maintenance Plan. This checklist details these frequency periods, and submission of the form (every other year) is a certification that you have met these requirements. This inspection shall be done once in every six year period by a professional engineer (PE) or a professional landscape architect (PLA).

BMP Name(s)	Name: The bioretention area name will be shown on the BMP location map included with the Stormwater BMP Permit (Issued for this property). A typical name would be "Bioretention Area 1" or "Bioretention Area A". If this is not an existing bioretention area, then it may be named after the owner, developer, or other identifying information.			Today's Date:	Date of last inspection:
Property Info	Street Address:	City:	State:	Zip:	
Who is Inspecting the Bioretention?	Name (Last, First, Middle Initial):			Current Title (if different):	
	Street Address (if not the same as the property address):	City:	State:	Zip:	
	Phone #:	Email:	<input type="checkbox"/> PE <input type="checkbox"/> PLA <input type="checkbox"/> Other		
Who Owns the Bioretention?	Name (Person or Company):			Contact Person (if different):	
	Street Address:	City:	State:	Zip:	
	Phone #:	Email:			

This Section is for the following items:	1. Tree Health	2. Tree Health	3. Tree Health	4. Tree Health	5. Tree Health
	Yes	No	Yes	No	Yes
	Yes	No	Yes	No	Yes
	Yes	No	Yes	No	Yes
	Yes	No	Yes	No	Yes
	Yes	No	Yes	No	Yes

Submit completed forms on:
 Email: stormwater@topeka.org
 Mail: Stormwater Management Section • City of Topeka Utilities Department
 435 5th St. • Topeka, Kansas 66603

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Bioretention Area Inspection Form

All items listed must be inspected unless Not Applicable (NA). Answering "Yes" indicates a need for maintenance. Please include an approximate repair date for items that require maintenance. The maintenance and inspection frequency shall be those in accordance with the Best Management Practices (BMP) Manual. This checklist details the frequency periods, and submittal of the form (every other year) is a certification that you have met those requirements. This inspection shall be done once in every six-year period by a professional engineer (PE) or a professional landscape architect (PLA).



Inspection Question	Answer			Describe Problem(s) and Solution(s)
	Y	N	NA	
Inlet, Pretreatment, & Outlet Structures (Components 1, 2, and 5) Success Factors: Vegetation, Protection, Two-Day Drain Time, and Cleanliness				
1. Are trash, sediment, debris, leaves, grass clippings, or other similar materials in the inlet or pretreatment structure?				
Guidance: Remove unwanted materials and correct any other problems that clog the inlet and soil or block the water flow into or out of the BMP. Schedule: Weekly				
2. Have curbs, gutters, grates, area inlets or other similar components been damaged or altered in any way that disrupts the flow of stormwater before and out of the BMP?				
Guidance: Repair damage or alterations before the next storm, if possible. If repairs must be performed immediately, follow up guidelines. Replace damaged components and seal with sealant as needed. Schedule: Weekly				
3. Are there shrubs and/or trees (not called out in the BMP BMP Manual) planted, installed, supported, or in evidence of soil erosion in the pretreatment structure?				
Guidance: Trees/shrubs can block water flow. Only by approved methods can the removal of shrubs and trees with root systems be appropriate, non-woody vegetation. Replace any dead or unhealthy vegetation. Repair areas of erosion and expose. Schedule: Weekly for bare soil. Monthly for vegetation concerns.				
Visit Comments				
4. Notice another problem? Describe in comments.				

✓ Question

✓ Guidance

✓ Schedule


Submit completed forms to:
Email - stormwater@topeka.org
Mail - Stormwater Management Section • City of Topeka Utilities Department
233 SE 7th St • Topeka, Kansas 66603



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Bioretention Area Inspection Form

Use this page for any notes, comments, or questions generated by your inspection. If you are using this page to continue your notes from a previous session, please include the session name and session number. You may also use this page to address items not covered on the inspection form.

Bioretention Area Inspection Form

Provide a photograph of your BMP to document the compliance inspection to be submitted every other year.

Submit completed forms to:
Email - stormwater@topeka.org
Mail - Stormwater Management Section • City of Topeka Utilities Department
233 SE 7th St • Topeka, Kansas 66603




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✓ Additional Comments

✓ Photographs


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Stream Buffers

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Buffer Area Ordinance

TMC 17.10

Reasons for Change

- Disconnect stream buffer and 100-yr floodplain
- Eliminate confusing language for buffer adjustments due to specific site characteristics
- Utilize science-based information

Type I waterway buffer widths shall be increased in the case of steep slopes adjacent to the waterway that drain into the system. Specific adjustments are as follows:

Percent Slope	Width Adjustment to Buffer
0 to 14%	No change
15% to 25%	Add 25 feet
Greater than 25%	Add 50 feet

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TMC 17.10 Buffer Areas

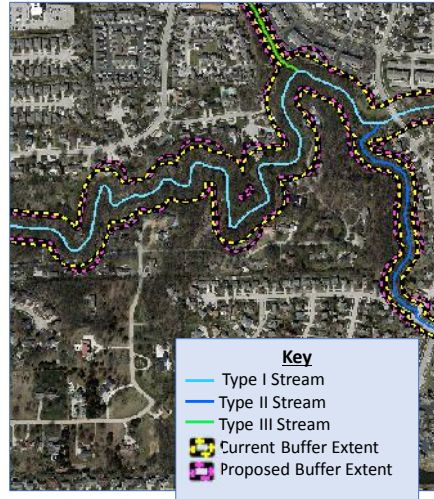


Science-Based Stream Buffer

Setback limits based on Stream direction • Ground slope • Ground curvature • Maximum flood depth • Maximum water velocity • Soil erodibility • Maximum shear stress

Proposed Change

- Stream-side area buffer remains the same
- Outer area buffer is defined by the Science-Based Stream Buffer *(provided by the City in a GIS-Layer)*



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Floodplain Ordinance



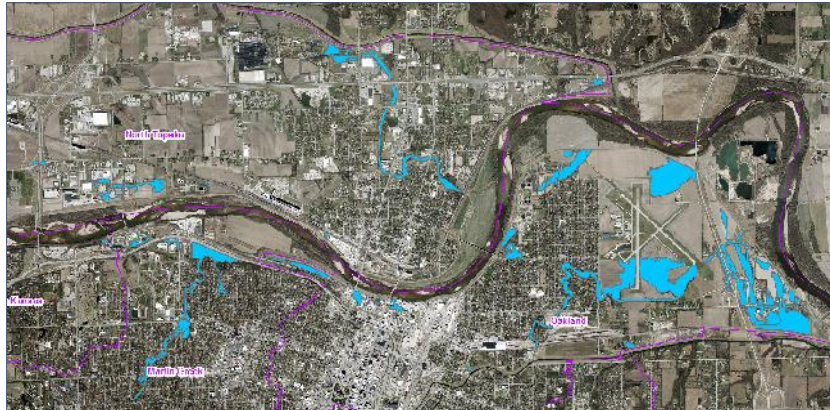
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TMC 17.30- Floodplain Management Revisions



- Requirements added for construction in AH Zones illustrated as Ponding areas in the Topeka Levee Certification package.



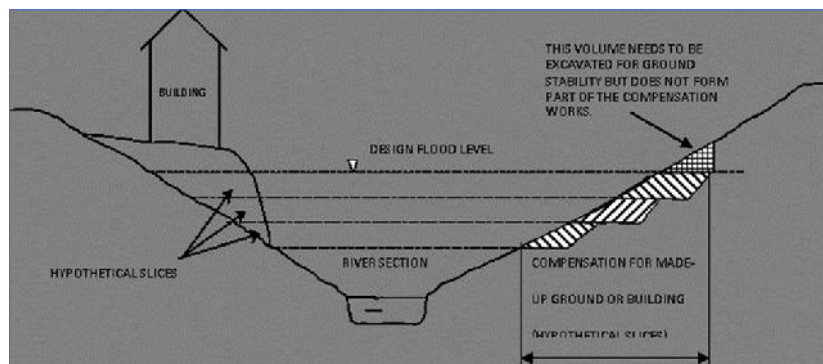
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TMC 17.30- Floodplain Management Revisions



- All fill in a designated AH Zone/Ponding area shall be offset by compensating cut to negate volume losses and should be frequency/stage based.



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What Happens Next?

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Next Steps

- City website
 - BMP Design Handbook and BMP Maintenance Manual<https://www.topeka.org/utilities/about-the-stormwater-utility/>
- Send comments and questions to
 - Braxton Copley (bcopley@topeka.org)
- **August** - Work sessions with the Planning Commission and City Council
- **September** - Ordinance consideration/adoption

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