

concentration of 5 minutes. The area used is the impervious surface only within the treatment drainage area (project site).

### CITY ORDINANCES

#### Chapter 9, Division III.- Post-Construction

9-1626 Post-Construction requirement of permanent BMP's...

9-1627 Certification of permanent BMP's...

9-1628 Ongoing inspection and maintenance of permanent BMP's...

9-1629 Timeline for post-construction criteria implementation...

### DESIGN REFERENCE MANUALS

Designs for STF's **must** be identified on the plans and specifically reference one of the following drainage manuals:

- Lincoln, Drainage Criteria Manual, Chapter 8: Stormwater BMP's

<https://lincoln.ne.gov/city/ltu/watershed/dcm/>

- NDOT, Drainage Design and Erosion Control Manual, Chapter 3: Stormwater Treatment

<https://dot.nebraska.gov/projects/environment/roadside/erosion/>

- Omaha, Regional Stormwater Design Manual, Chapter 8: Stormwater BMP's

<https://omahastormwater.org/orsdm/>

- UDFCD, Urban Storm Drainage Criterial Manual Volume 3, Chapter 4: Treatment BMP's

<https://udfcd.org/volume-three>

### STF Varieties

- Bio-swales
- Sediment Forebays
- Rain Gardens
- Regional (Dry) Detention Cells
- Regional (Wet) Retention Cells
- Underground Detention
- Downspout Filters
- Grass Swale
- Filter Strips
- Bio-Retention Area

**These STF's cover a range of area, topography, and wet or dry conditions.**

**In some cases, accounting for water quality improving could be as simple as installing/adjusting a structures invert or adding native vegetation to a detention cell.**

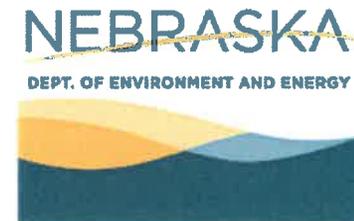
#### **City of Kearney**

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# **POST- CONSTRUCTION STORMWATER MANAGEMENT PROGRAM**



## **Description of the City of Kearney's Post-Construction Stormwater Management Program**



## WHAT IS THE POST-CONSTRUCTION STORMWATER MANAGEMENT PROGRAM?

The Federal Municipal Separate Storm Sewer System (MS4) Permit the City of Kearney operates under requires this program with the purpose of improving water quality upon leaving a completed construction site.

The specifics of the Post-Construction Program can be found at [www.cityofkearney.org](http://www.cityofkearney.org) under the Department of Public Works>Stormwater Management>Post-Construction Program Overview.

Our Post-Construction Program has been in place since late 2017 and we have recently installed new information on the website. Frequency of maintenance and a description of the routine and non-routine maintenance for a variety of STF's can be found by contacting our Public Works Department.

### A Project Qualifies when:

- It's inside the City Limits **AND**
- It's a development/redevelopment project with greater than an acre of \*disturbed area **AND**
- It was re-platted after Sept. 1, 2017 **OR**
- It was preliminarily platted after Sept. 1, 2017

\*Disturbed Area=construction footprint+staging area+any area disturbed by construction activity.

### Plans

Plans shall include the following information and be submitted with design plans to be recorded by the City:

- Site topography including existing contours,

property lines and easements, utilities, and site features such as existing water bodies, trees and shrubs, pavement and other structures

- Proposed contours
- Proposed inlets, storm sewer, culverts and drainage ways
- Proposed STF's and/or detention facilities
- Proposed roadways, buildings, parking, and other structures

Most of this information is already included on a basic set of site plans.

Development Review Team presentations, and Plan Review are the opportune times to ask desired questions about this program and its requirements:

- Submittal Checklist
- Certified As-builts
- Inspection Protocol
- STF Description Table

Table 1, "P" value

	Region A (West)	Region B (Central)	Region C (East)
<b>New Development 80% Rain Event</b>	<b>0.61"</b>	<b>0.72"</b>	<b>0.83"</b>
<b>Redevelopment 70% Rain Event</b>	<b>0.44"</b>	<b>0.53"</b>	<b>0.62"</b>

### Stormwater Treatment Facilities (STF's)

STF's are permanent Best Management Practices (BMP's) put in place to provide control and treatment of stormwater runoff after construction for land development is complete. These facilities are physical in

nature and sometimes referred to as "Structural" BMP's.

The process for determining the size of these STF's is a calculation used for finding the water quality control volume (WQCV) OR water quality volume discharge rate (Q<sub>wq</sub>)

WQCV= volume in CF

$$P \times (0.05 + .009 \times \%Imp) \times A \times 1/12 \times 43,560$$

- P= rainfall depth, in (Table 1)

- A= \*disturbed area on project, ac

- % Imp= Max. percent imperviousness (expressed as a whole number for proposed zoning type)

\*Disturbed area includes final footprint AND area involved in construction process such as staging grounds, stockpiles, etc...

A design drain time of **24 hours** will be used for all STF's that use a WQCV method.

Q<sub>wq</sub>= flowrate in CFS

Impervious Area (Acres)	Q <sub>wq</sub> (cfs) By Region			Impervious Area (Acres)	Q <sub>wq</sub> (cfs) By Region		
	West	Central	East		West	Central	East
0.4	0.3	0.3	0.4	2.4	1.6	2.0	2.4
0.8	0.5	0.7	0.8	2.8	1.9	2.4	2.8
1.2	0.8	1.0	1.2	3.2	2.2	2.7	3.2
1.6	1.1	1.4	1.6	3.6	2.5	3.0	3.6
2.0	1.4	1.7	2.0	4.0	2.7	3.4	4.0

This is the peak runoff from the design water quality volume event. This is the 'Natural Resources Conservation Service (NRCS) Curve Number Procedure. It is based on the 80<sup>th</sup> percentile rainfall event, a 24-hour duration storm event, and a time of