



Stormwater Ordinance
(Post Construction Stormwater Management)
Effective February 1, 2016

Technical Presentation



NDEQ Stormwater Requirements



Dave Heineman
Governor

STATE OF NEBRASKA

DEPARTMENT OF ENVIRONMENTAL QUALITY

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Authorization to Discharge Under the National Pollutant Discharge Elimination System (NPDES)

This NPDES permit is issued in compliance with the provisions of the Federal Water Pollution Control Act (33 U.S.C. Secs. 1251 *et. seq.* as amended to date), the Nebraska Environmental Protection Act (Neb. Rev. Stat. Secs. 81-1501 *et. seq.* as amended to date), and the Rules and Regulations promulgated pursuant to these Acts. The municipal separate storm sewer system (MS4) identified in this permit is authorized to discharge storm water and other authorized flows, and is subject to the limitations, requirements, prohibitions and conditions set forth herein. This permit regulates and controls the release of pollutants in the discharges authorized herein. This permit does not relieve Permittees of other duties and responsibilities under the Nebraska Environmental Protection Act, as amended, or established by regulations promulgated pursuant thereto.

NPDES Permit No.: **NE0133671**

IIS File No.: **999333**

Permittee: **City of Lincoln, Nebraska**

Coverage: **All discharges from the Lincoln MS4 system that discharge to waters of the State, including any MS4 discharges that may reach waters of the State through intermediate drainage ways or conduits.**

Receiving Water: **Salt Creek and several tributaries**

Effective Date: **January 1, 2013**

Expiration Date: **December 31, 2017**

Pursuant to the Delegation Memorandum dated January 12, 1999 and signed by the Director, the undersigned hereby executes this document on the behalf of the Director.

Signed this 26th day of December, 2012

Marty Link
Acting Water Quality Division Administrator

Stormwater Ordinance 28.03

- ❖ 2012 Mayor's Clean Water Program Task Force Meetings
- ❖ 2012 - 2013 Ordinances Drafted based on Task Force Recommendations
- ❖ 2013 Follow up with Task Force and Others
- ❖ January/February 2014 Ordinances and Drainage Criteria Manual approved with two year sun rise clause
- ❖ Fall 2015 Design Standards to Planning Commission/City Council
- ❖ February 1, 2016 Ordinances go into effect

2012 Task Force





Ordinance Requirements

- ❖ Manage water quality events
 - ❖ Waiver for:
 - ❖ Developments that have planning commission approval prior to February 1, 2016
 - ❖ Redevelopments that have building approval prior to February 1, 2016
 - ❖ Director granted exemptions
- 



Ordinance Requirements

- ❖ Management of all rainfall events for development and redevelopment projects with land disturbance of one acre or more
 - ❖ 0.83 inches or less for development projects (80% event)
 - ❖ 0.62 inches or less for redevelopment projects (70% event)



Submittal Requirements

- ❖ Post Construction Stormwater Management Plan submittal (example in Drainage Criteria Manual)
 - ❖ Description including Water Quality Control Form and Owner
 - ❖ Plans (location, schedule, BMP design)
 - ❖ Maintenance Plan and Agreement (including schedule, procedures and who is responsible for maintenance)



Ordinance Requirements

❖ Credits

- ❖ Credits available within each watershed (e.g. Beal Slough, Antelope Creek, etc)

- ❖ Credits for managing stormwater above the criteria amount

- ❖ Credits for using conservation design practices

Design

Water Quality Control Volume

$$\text{❖ } WQCV = P \times (0.05 + 0.09 * I) \times A \times \frac{1}{12}$$

❖ WQCV in acre feet

❖ P = rainfall amount in inches (e.g. 0.83", 0.62")

❖ I = Percent impervious area

❖ A = contributing drainage area in acres

$$\text{❖ } \text{Volume (ft}^3\text{) to treat} = WQCV \times 43,560$$



Design

Storage Volume/ Release Rates

- ❖ BMP Facilities shall be adequate to hold the WQCV
- ❖ Generally release rates are over a 24 to 40 hour period
 - ❖ For extended detention ponds, both water quality and quantity will be drained with 72 hours
 - ❖ Retention ponds and subsurface BMPs will be drained between 12 and 40 hours

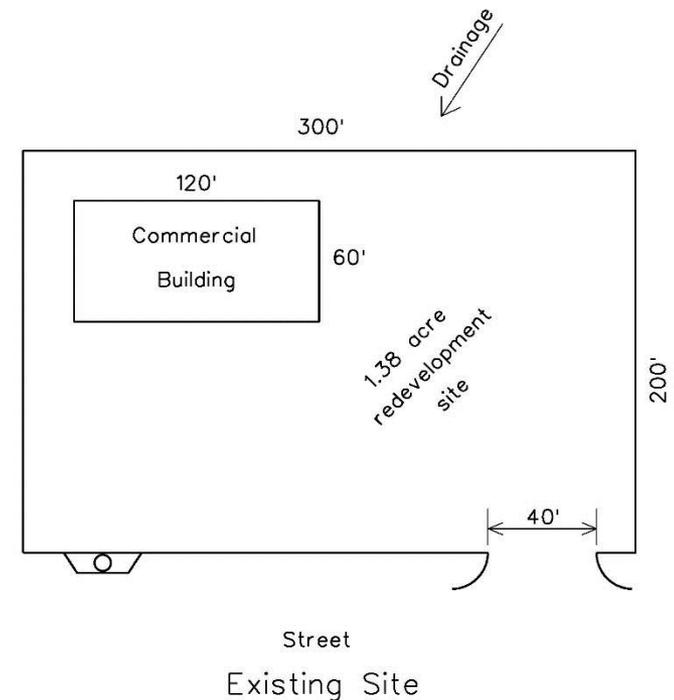
Example A: Redevelopment of 1.52 acre Commercial Site

P = 0.62 inches, 98 % impervious

Eq 8.1: $WQCV = P \times ((0.05 + 0.009 \times I) \times A \times 1/12$

$WQCV = 0.62 \times (0.05 + 0.009 \times 98) \times 1.38 \times 1/12$

$WQCV = 0.066$ acre ft (2895 cubic feet)



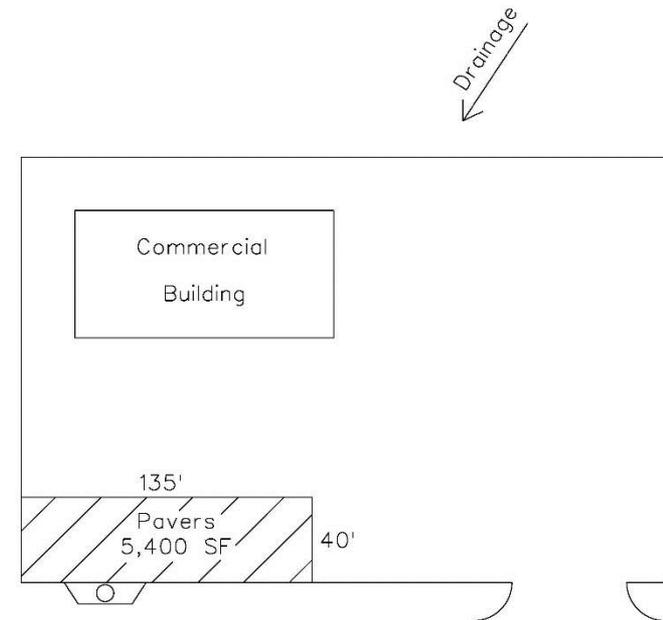
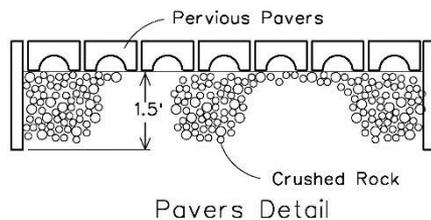
Example A1: Pave Drain BMP

BMP Volume Available : 5,400 sq ft pervious pavement, 18" medium, pave drain, 0.4 porosity

Eq 8.7: $V_r = P_{or} \times ((D-1)/12) \times A_p + 1/12 \times A_p$ {1/12 x A_p is volume available within the pave drain}

$$V_r = 0.4 \times ((18-1)/12) \times 5400 + 1/12 \times 5400$$

$V_r = 3060$ cubic ft sub surface and 450 cubic ft pave drain for 3510 cubic ft

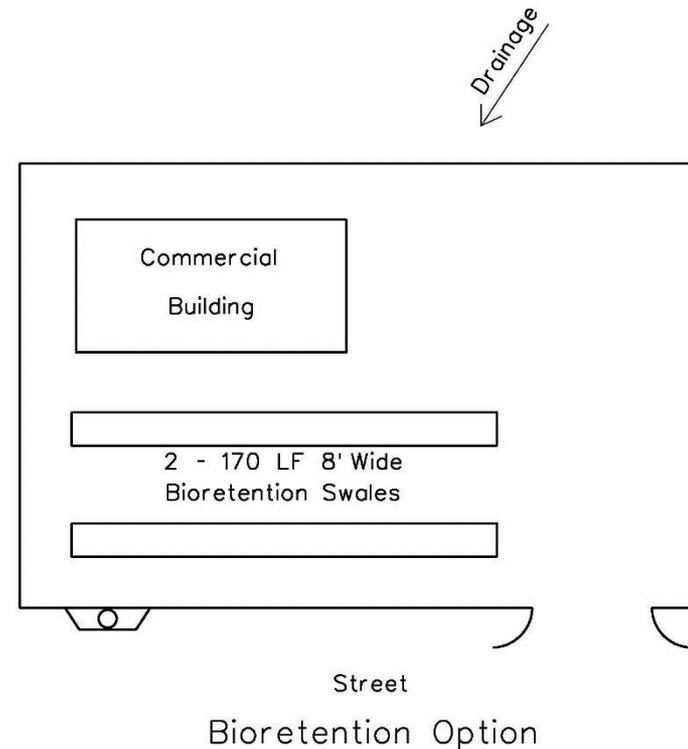
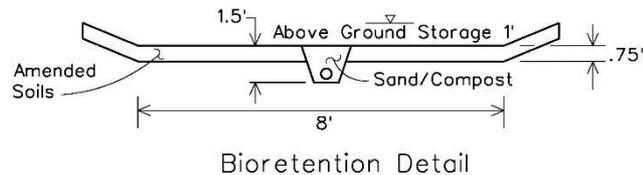


Pervious Pavers Option

Example A2: Bioretention BMP

BMP Volume Available : 340 ft long bioretention, 8 ft wide with above ground storage, amended soils (0.2 porosity), soil/compost core (0.3 porosity)

- Cross sectional area available for storage is 9.53 square feet
- With length of 340 feet, volume is 3240 cubic feet

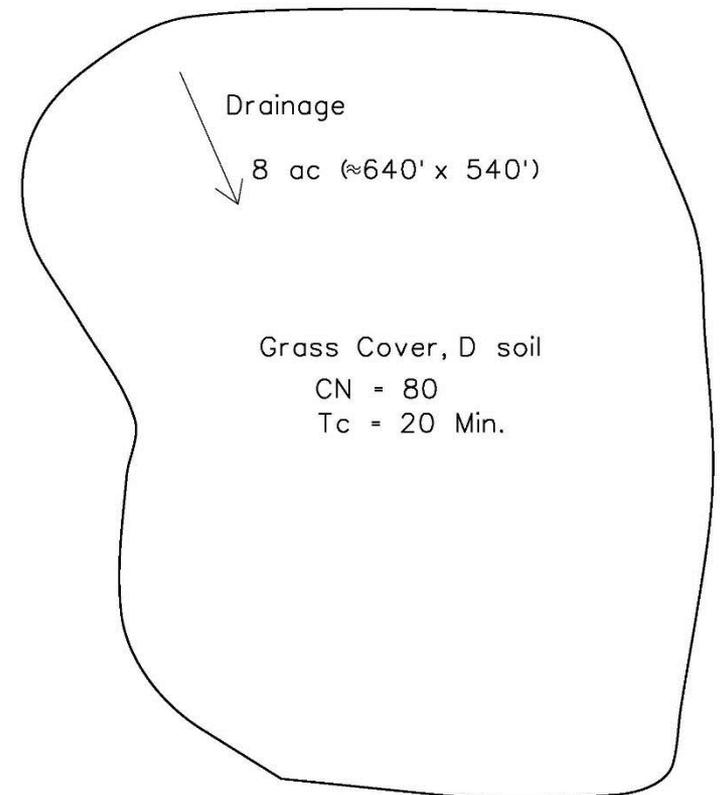


Example B: New Development of 8 acres

Existing Conditions
Grass cover, D Soil
CN = 80, Tc = 20 minutes

Q2 = 10.9 cfs
Q10 = 23.2 cfs
Q100 = 38.7 cfs

Existing





Example B: New Development of 8 acres

Proposed Conditions
Residential
CN = 87, Tc = 9 minutes

Q2 = 21.8 cfs
Q10 = 40.0 cfs
Q100 = 61.6 cfs

I = 38% Impervious
P = 0.83 inches

$WQCV = 0.83 \times (-.05 + 0.009 \times 38) \times 8 \times 1/12$
WQCV = 0.217 acre ft



Example B: New Development of 8 acres

Proposed Conditions without water quality
Detention Pond of 1.33 acre feet
4 ft depth with 1 ft freeboard
2 ft wide slot outlet

Existing Flows

Q2 = 10.9 cfs

Q10 = 23.2 cfs

Q100 = 38.7 cfs

Proposed Flows

9.7 cfs

20.3 cfs

33.2 cfs

Example B: New Development of 8 acres

Proposed Conditions with water quality
Detention Pond of 1.67 acre feet
5 ft depth with 1 ft free board
2.5 ft wide slot outlet one ft above pond bottom

Existing Flows

Q2 = 10.9 cfs

Q10 = 23.2 cfs

Q100 = 38.7 cfs

Proposed Flows

7.0 cfs

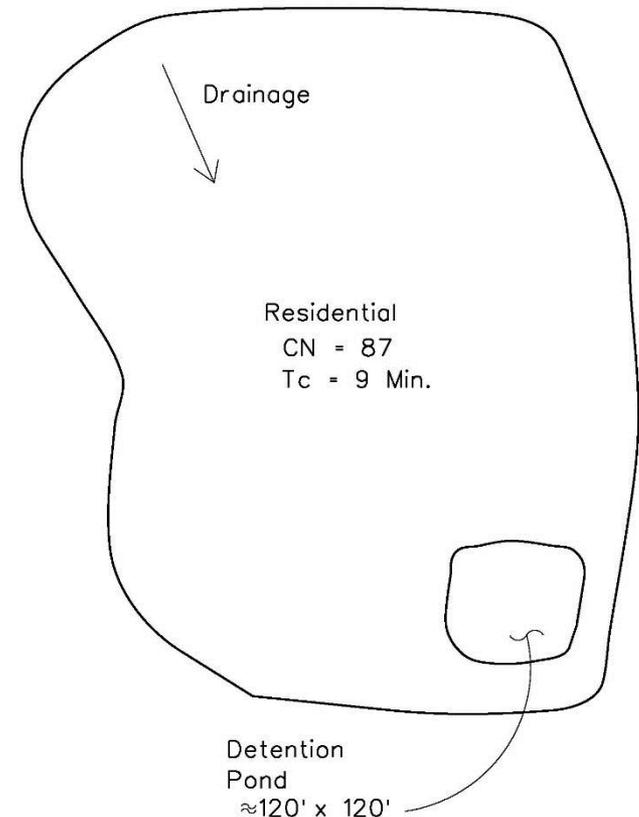
20.8 cfs

35.3 cfs

WQCV = 0.217 ac ft

BMP Volume available below slot = 0.248 ac ft

Proposed





Land Redevelopment Project Examples

- ❖ Building permit approved on or after 2/1/16 with more than one acre of disturbance
- ❖ Amendment to existing use permit to change one acre or more of existing parking lot and building to new building and parking (building permit approval on or after 2/1/16)



Land Development Project Examples

- ❖ Amendment approved on or after 2/1/16 to approved PUD adding one are or more of agricultural land to future residential. Added area subject to ordinance 28.03
- ❖ Amendment approved on or after 2/1/16 to approved PUD that completely revises street and lot layout of one acre or more
- ❖ New acreage subdivision outside city limits but within 3 mile jurisdiction approved on or after 2/1/16
- ❖ Amendment approved on or after 2/1/16 to approved CUP that revises grading of one acre or more



Exemption Examples

- ❖ New use permit one acre or greater approved on or after 2/1/16 for existing commercial facility where disturbing less than one acre for second building and additional parking
- ❖ Amendment to special permit on or after 2/1/16 where the initial special permit was approved prior to 2016 but doesn't change the site plan (e.g. adjustment to height or parking)
- ❖ New PUD for residential/commercial development approved January 2016 (approved prior to 2/1/16)



Watershed Management

- ❖ For more information contact Ben Higgins
 - ❖ watershed@lincoln.ne.gov
 - ❖ 402-441-7589
 - ❖ lincoln.ne.gov (keyword 'clean water')