

# City of High Point



## Stormwater Best Management Practices Design Manual

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## INTRODUCTION

All local governments that review stormwater management plans under a state stormwater program such as Water Supply Watershed, Nutrient Sensitive Waters, or Phase II NPDES program are to provide a substantially equivalent level of water quality protection as the provisions in the Division of Water Quality (DWQ) Stormwater Best Management Practices (BMP) Manual. Therefore, to comply with the North Carolina Division of Water Quality, and in an effort to improve consistency in stormwater best management practice, design, and approval, the City of High Point has adopted the Division of Water Quality's Stormwater Best Management Practices Manual. The Division of Water Quality BMP Manual can be accessed at <http://deq.nc.gov/about/divisions/energy-mineral-land-resources/energy-mineral-land-permit-guidance/stormwater-bmp-manual>.

National Pollutant Discharge Elimination System (NPDES) Phase II stormwater regulations apply jurisdiction-wide. Therefore, BMP requirements shall apply to all property within the city of High Point and its extraterritorial jurisdiction.

All WS-IV water supply watersheds using the high-density option must control the first 1" of rainfall on any site that exceeds 24% built-upon area. In the lower Randleman watershed, any site that exceeds 12% built-upon area must control the first 1" of rainfall. The North Carolina Department of Environment and Natural Resources (NCDENR) requires that these control measures not only control the first 1" of rainfall, but also remove 85% of the total suspended solids (TSS).

The sources of High Point's drinking water (Oak Hollow Lake, City Lake, and Randleman Reservoir) are largely urban watersheds. As such, the City of High Point believes that additional measures for controlling stormwater runoff, beyond those required by DWQ, should be installed. Therefore, additional stormwater controls are required on any proposed development that exceeds 6% built-upon area and is less than 24% built-upon area (less than 12% built-upon area if the development is in the Randleman Watershed). Additional BMPs include natural infiltration areas, dry detention ponds, and infiltration trenches. Other BMPs that control the first 1/2" of rainfall may also be acceptable, and engineers are encouraged to discuss any innovative control devices with the Watershed Enforcement Officer and the City Engineer.

In addition to *North Carolina Division of Water Quality BMP Manual, Chapter 10, Wet Detention Basin*, the City of High Point requires the following additional wet detention basin design elements:

- a. A pond structure requires review and approval from the North Carolina Department of Environmental and Natural Resources if the proposed embankment is fifteen feet or greater in height and has an impoundment capacity of at least ten acre-feet. If a permit is required, the detention pond must meet the general requirements contained in the North Carolina Dam Safety Act.
- b. The pond must be easily accessible for maintenance. A 20' wide access easement shall be provided from the public street right-of-way to the pond and shall be continuous around the pond.
- c. At inflow points to the pond and discharge points from the pond, energy dissipaters such as Rip-Rap shall be used to reduce the velocity of the flow.

- d. The dam or embankment shall be constructed of material with sufficient strength to remain stable, and with low permeability to prevent seepage of water through the embankment.
- e. For earth dams, a cutoff trench shall be provided with a minimum width of 4'. The cutoff trench shall be backfilled with clay or other highly impermeable material and compacted to at least ninety-five percent (95%) of standard proctor density.
- f. The top width of the dam shall be based on the total height of the embankment (measured vertically from the downstream toe of the embankment to the top of the dam). The minimum top width of the dam shall be 10' for total embankment heights of 10' or less. The minimum top width of the dam shall be 15' for total embankment heights greater than 10'.
- g. Concrete dams and spillway structures shall be designed and built in accordance with the American Concrete Institute's (ACI) guidelines. Particular attention shall be paid to design and analysis, water tightness, concrete quality, and construction practices. No more than 50% of the pond embankment can be concrete.
- h. The principal spillway shall be designed for the 10-year pre-development storm event. The post-development discharge from the wet detention basin should be equal or less than the pre-development discharge for the 10-year storm event.
- i. The minimum difference in elevation between the principal spillway elevation and the emergency spillway elevation shall be one (1) foot.
- j. The minimum diameter of the principal spillway barrel (horizontal section) shall be fifteen (15) inches. The minimum cross-sectional area of the riser section (vertical pipe) shall be 1.5 times the diameter of the barrel section.
- k. Anti-seep collars shall be installed on all pipe conduits through earthen dams and embankments.
- l. Vertical risers shall be equipped with an anti-vortex device to improve the flow of water, and with a trash rack to prevent floating debris from clogging the principal spillway.
- m. Anti-floatation devices shall be provided and calculations submitted with a safety factor of 1.25.
- n. The emergency spillway shall be designed to safely convey the 100-year storm event.
- o. A minimum of one (1) foot of freeboard from the top of the pool elevation from the 100-year storm event to the top of the dam embankment shall be provided.
- p. The minimum difference in elevation between the emergency spillway elevation and the top of the dam embankment shall be two (2) feet.
- q. Spillways shall not be constructed in the fill section of the dam embankment.