
1.0 Introduction

1.1 Purpose

The management of all water pollution sources, both point and non-point sources, is a stated goal of the 1987 amendments to the Clean Water Act. An important source of pollutants is storm water runoff from urban and developing areas. This runoff can degrade water quality in the receiving stream system. The City of Charlotte, Mecklenburg County, and the Towns of Cornelius, Davidson, Huntersville, Matthews, Mint Hill, and Pineville have adopted post-construction storm water ordinances for the purpose of controlling and managing storm water runoff and associated negative water quality and quantity impacts resulting from post-construction storm water discharges through the use of structural management practices.

The key objectives of the post-construction ordinances are:

1. Achieve compliance with the Phase I and Phase II NPDES Storm Water Permit requirements for post-construction pollution control, as applied to the respective jurisdictions.
2. Satisfactorily address the guidelines to mitigate the cumulative and secondary impacts to aquatic and terrestrial wildlife resources and water quality specified by the N.C. Wildlife Resources Commission and the U.S. Fish and Wildlife Service for Goose Creek and the Yadkin River Watershed.
3. Satisfactorily address the causes of impairment identified in the N.C. 2002 Integrated 305(b) and 303(d) Report for surface waters in Mecklenburg County when the potential sources of water quality impairment are identified as urban runoff/storm sewers.
4. Satisfactorily address detention measures for the control of storm water volumes and peaks associated with new construction.

This manual has been developed to assist in the design and evaluation of storm water management facilities (BMPs) for demonstrating compliance with Phase I and Phase II post-construction storm water ordinances, watershed protection overlay ordinances, detention ordinances, rezoning notes, and BMPs required by State 401 Water Quality Certifications. The manual provides engineering and professional design guidance to:

- local agencies responsible for implementing the Charlotte-Mecklenburg Storm Water Management program,
- professional designers responsible for the design of storm water management facilities,
- developers involved in site planning and design,
- others involved in storm water management at various levels who may find the manual useful as a technical reference to define and illustrate engineering design techniques.

Application of the procedures and criteria presented in this manual will contribute toward the effective and economical management of storm water in the community.

Design methods other than those included in this manual may be used if approved by the specific jurisdiction in which the proposed project occurs. Complete documentation of these methods showing that the alternative results provide the same or higher level of protection may be required for approval.

1.2 Contents

The manual presents technical and engineering procedures and criteria needed to comply with BMP design requirements contained in post-construction storm water ordinances, watershed protection overlay ordinances, detention ordinances, rezoning notes, and BMPs required by State 401 Water Quality Certifications in the City of Charlotte, Mecklenburg County and the six Towns.

Where appropriate, each chapter contains the equations, charts, and nomographs needed to design specific storm water management facilities. Example problems are used to illustrate the use of the procedures. The examples include the use of hand computations and computer analysis. The hand computations and computer analysis shown in the examples are the methods by which project submittals may be checked and approved. Alternative computational methods or computer programs may be used; however, compliance with the post-construction ordinance will be assessed by each jurisdiction's staff using the methods presented in this manual.

1.3 Limitations

This manual provides a compilation of readily available literature, results of storm water monitoring and modeling efforts, and standard accepted practices relevant to storm water management activities in the Charlotte-Mecklenburg area. Since some of the material presented was obtained from publications which have not been duplicated in its entirety, the user is encouraged to obtain the original or additional reference material, as appropriate. References are included at the end of each chapter.

1.4 Updating

This manual will be updated and revised, as necessary, to reflect up-to-date engineering and professional practices and information applicable to the Charlotte-Mecklenburg area. Registered manual users who provide a current address will automatically be sent notices of changes as they are produced. The updated manual will be available on the Charlotte-Mecklenburg Storm Water Services website in digital format for downloading at: <http://stormwater.charmeck.org>.

1.5 Other Resources

This manual must be used in conjunction with other applicable and/or adopted standards, publications, regulations, etc. The other applicable standards include the latest approved versions of:

- Charlotte-Mecklenburg Storm Water Design Manual
- Charlotte Land Development Standards Manual
- Mecklenburg County Land Development Standards Manual
- North Carolina Department of Environment and Natural Resources (NCDENR) – Manual of Stormwater Best Management Practices
- North Carolina Department of Environment and Natural Resources (NCDENR) – Erosion and Sediment Control Planning and Design Manual
- North Carolina Department of Transportation (NCDOT) - Standard Specifications for Roads and Structures
- Charlotte-Mecklenburg Utilities (CMU) Policies, Procedures, Standards and Specifications

The standard that is most protective of water quality must be used, if different standards are presented in these or any other resources.