

# Summary of Changes in the Stormwater Design Manual Draft v3

Draft v3 has been edited substantially from the Draft v2, which had only a few edits from Draft v1. Below is a summary of changes that considers both the changes since Draft v2 and the changes from the Current Stormwater Design Manual and Guidelines for Land Disturbing Activity (GLDA), which are both being replaced by the new Manual.

## Overall

Guiding principles for Draft v3 are as follows:

- Avoid duplication with Professional References – When free, easily accessible references were available, they were referenced rather than repeating the content.
- Avoid duplication with the UDO – When requirements were clearly stated in the UDO, they were referenced rather than repeated. Likewise, an attempt was made to avoid duplication within the document.
- Write for a technical audience – The audience for the design manual is licensed professionals qualified to perform stormwater design. The content has not been tailored to a general audience.
- Checklists removed – Checklists are no longer part of the Manual. Checklist will be created and posted on the web prior to the adoption of the Manual.

Chapter reorganization was made as follows:

- An Easements chapter was added to consolidate information on this topic. In Draft v2 easement information was in Chapter 2, 4, and 5. In the current Manual easement information is in Chapter 1.
- Stormwater Management Design (Chapter 5 in Draft v2) was split into two chapters for better organization: Chapter 5 Stormwater Management Calculations and Chapter 6 Stormwater Control Measure Design. This information is in Chapter 3 of the Current Manual.

## Chapter 1 – Introduction

- Chapter summaries from Draft v2 have been replaced with a summary of each topic reviewed by the Raleigh Stormwater, referencing the UDO, Permits, and relevant Chapter(s).
- Drafts v1 and v2 included recommendations on the site planning process. These have been removed.
- Abbreviations and additional definitions have been added since the original manual. The definitions have been edited since the Draft v2.

## Chapter 2 – Site Requirements

- The concept of Small Site and Large Site Development, introduced in Draft v1 and v2, has been removed as it was causing confusion.
- The required reference material was integrated with Chapter 1.
- The Lot Grading Plan, introduced in Draft v1 and v2, was edited to remove the Small versus Large Site references. The Lot Grading Plan will now only be required for projects that fall under Exempt Property requirements in UDO 9.2.2.A or for other one- and two-unit dwelling projects.
- The Stormwater Development Analysis (SDA) has been renamed the Stormwater Compliance Report (SCR) because some of the projects that must submit the SCR are not associated with development.
- The Designers Letter, introduced in Draft v1 and v2, has been removed – instead some projects will submit a very abbreviated SCR.
- The 10% Rule has been removed as a requirement.
- Easement information was moved to Chapter 7 – Easements.
- Some aspects of GLDA were not carried over. For example, there are no longer required setbacks for grading and retaining walls.

## Chapter 3 – Hydrology

- A section was added for drainage area delineation and analysis to better explain the UDO requirements.
- Details were added about underlying methodology that can be used to determine if future software is acceptable for compliance with the City's regulations.
- Detailed instructions for the NRCS Method were removed because the information was readily available from free standard professional references.
- Coefficient values were added to model runoff from future land use based on current Raleigh zoning or the Future Land Use Map. The values in the Current Manual and the v2 Draft were based on previous zoning designations.
- Two additional hydrologic models were specifically allowed: HEC-HMS, which was developed by the Army Corps of Engineers and is used in FEMA models, and SWMM, which was developed by EPA and is being used in Raleigh's watershed planning efforts.
- The Modified Rational Method was removed as an acceptable method because it is not widely used NC. Reference materials found were specific to other states.
- The Kirpich Equation was removed as an acceptable method for time of concentration. This brings the City into line with NCDOT methods for Tc.
- Cf values were removed from the Rational Method because they are not recommended by the FHWA in HEC-22.
- The requirements for removal of impervious area were moved to Chapter 2.

## Chapter 4 – Stormwater Conveyance Design

- The chapter title was changed to better reflect the content.
- The information on Outlet Design, which is related to SCMs, was moved to Chapter 6 – SCM Design.
- As introduced in Draft v1 and v2, the Design Storm for conveyances with a drainage area >25 acres will be the 25-year storm.
- As introduced in Draft v1 and v2 and was existing practice, the manual clarifies that the HGL for the design storm must be at or below the crown of the pipes.
- As introduced in Draft v1 and v2, the design storm for gutter spread will be the 10-year storm.
- The Erosion Hazard Setback, introduced in Draft v1 and v2, has been removed since it overlapped significantly with the channel easements and watercourse buffers.
- The allowable pipe materials have been updated since Draft v2 to reflect the availability of Polypropylene (PP) pipe. The requirements for RCP, PP, and HDPE have been updated in terms of use in the ROW. Mandrel testing is now required for PP and HDPE pipes.
- Information about the new Stormwater Conveyance System Permit and As-built Certification process has been added.

## Chapter 5 – Stormwater Management Calculations

- This chapter was split off from the SCM Design Criteria, now in Chapter 6.
- The Water Quality Requirements section has been significantly revised to reflect the changes in the Neuse Rules that became effective on 5/1/2023. This section reflects the written guidance posted on the City's website in May 2023 in response to that change.
- Drafts v1 and v2 proposed to replace the current 2-year peak discharge requirement with a 1-year peak discharge requirement. This change is no longer being proposed.

## Chapter 6 – SCM Design

- This chapter was split off from the Stormwater Management Calculations, now in Chapter 5.
- The section on criteria for all SCMs was expanded.
- Soakage Trenches, which are a type of Infiltration System, were combined with Infiltration Systems.
- Planter Boxes, which are a type of Bioretention, were combined with Bioretention.
- References to Small Sites and Large Sites were removed as these were found to be confusing.
- As-built requirements were moved from the checklist to the chapter.
- O&M Manual requirements were modified.
- Inspection and Maintenance agreements will be required for all SCMs, as shown in Draft v1 and v2.

## Chapter 7 – Easements

- The Easements chapter was added to consolidate information on this topic. In Draft v2 easement information was in Chapter 2, 4, and 5. In the current Manual easement information is in Chapter 1.
- A Downstream Discharge Easement will be required. This was introduced in the Draft v1 and v2 Manual, but it was not presented as clearly.
- Easement Widths for Open Channels/Swales were revised to be smaller than the Draft v2.
- The easements for larger culverts were further defined to provide for maintenance access.
- Easements for Dams were added with the previous Draft v2. They are made clearer in this document.
- A section on work in easements was added to eliminate the need for the Design Exception process for most projects.
- Flood Storage easements were previously required in the Current and Draft v2 Manual. The language was made clearer.
- SCM easements were revised to be clearer about the requirements than the Current and Draft v2 Manual.

## Chapter 8 – Erosion and Sediment Control

- Material that was redundant with the State's ESC Manual was removed, as compared to Draft v2.
- Design criteria that were commonly misunderstood in the UDO or were new were explained, but requirements that are clear in the UDO are not included as compared to GLDA and the Draft v2.
- The example construction sequences currently found in GLDA are included in this chapter.

## Chapter 9 – Floodplain Management

- The process for addressing flood soils was clarified.
- The requirements for a Flood Study have been changed from the 400 lf of stream requirement in Drafts v1 and v2 and the current requirement. Instead, the need for a Study will be based on the drainage area.
- Two types of Flood Studies have been defined as of v3: Simple Flood Study and Comprehensive Flood Study. This is expected to reduce the number of sites that provide the currently required level of detail.

## Proposed UDO Changes

- Various UDO changes will be proposed to reflect the Draft v3.
- The term Built Area, currently in the overlay regulations, will be replaced with Built Upon Area for consistency.
- In UDO Section 9.2.2.A.4.b.ii., the flood level requirement will be replaced by a peak discharge requirement.